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(71) **Demandeur/Applicant:**
BIOLOGICAL DYNAMICS, INC., US

(72) **Inventeurs/Inventors:**
KRISHNAN, RAJARAM, US;
TURNER, ROBERT, US;
HINESTROSA SALAZAR, JUAN PABLO, US;
LEWIS, JEAN, US;
CLARK, IRYNA, US;
SEARSON, DAVID, US

(74) **Agent:** GOWLING WLG (CANADA) LLP

(54) **Titre : METHODES ET SYSTEMES DE DETECTION ET DE DECOUVERTE DE BIOMARQUEURS**
(54) **Title: METHODS AND SYSTEMS FOR DETECTION AND DISCOVERY OF BIOMARKERS**

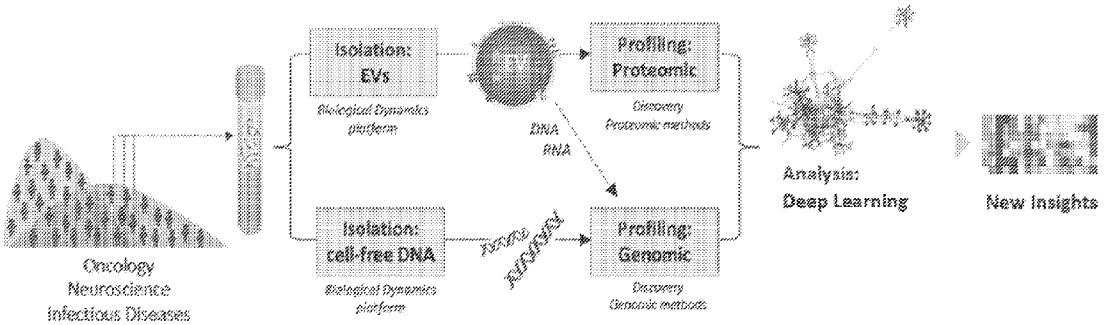

FIG. 5

(57) **Abrégé/Abstract:**
Provided herein are methods and systems for discovering biomarkers associated with risk of disease and methods using identified biomarkers for detecting disease prognosis and progression.

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Abstract:

Provided herein are methods and systems for discovering biomarkers associated with risk of disease and methods using identified biomarkers for detecting disease prognosis and progression.

METHODS AND SYSTEMS FOR DETECTION AND DISCOVERY OF BIOMARKERS

CROSS REFERENCE

[0001] This application claims the benefit of U.S. Provisional Application No. 63/136,572, filed January 12, 2021, U.S. Provisional Application No. 63/190,719, filed May 19, 2021, and U.S. Provisional Application No. 63/191,886, filed May 21, 2021, each of which is incorporated herein by reference in its entirety.

BACKGROUND

[0002] The discovery and use of biomarkers for detecting, monitoring, and treating disease states shows promise in providing improved outcomes for patients. As diseases often have complex etiologies, selecting a biomarker for detecting, monitoring, and treating a disease is challenging. For example, early-stage, localized tumors are often cured by surgical resection. However, some lethal cancers produce few symptoms, causing delayed diagnosis. Detection of early-stage cancers could transform the field by simplifying treatment while increasing survival.

SUMMARY

[0003] In an aspect, there are provided, methods for identifying a biomarker as associated with a disease state. In some cases the method comprises: (a) isolating a first plurality of analytes in a first biological sample of an individual known to have the disease state using an electrode array configured to generate an AC dielectrophoretic field; (b) isolating a second plurality of analytes in a second biological sample of healthy individual using an electrode array configured to generate an AC dielectrophoretic field; and (c) identifying a subset of the first plurality of analytes, wherein the subset is quantitatively different in the first biological sample compared with the second biological sample, wherein the subset is identified as associated with the disease state. In some cases, isolating comprises using electrodes configured to generate a dielectrophoretic low field region and a dielectrophoretic high field region. In some cases, isolating comprises capturing the first plurality of analytes or the second plurality of analytes on one or more electrode. In some cases, the subset comprises mass spectrometry analysis of the first plurality of analytes and the second plurality of analytes. In some cases, identifying the subset comprises quantifying each of the first plurality of analytes and the second plurality of analytes. In some cases, the analyte comprises a protein or a polypeptide. In some cases, the analyte comprises a nucleic acid. In some cases, the analyte comprises an exosome. In some cases, the disease state is a cancer, a neurological disease, an infection, or an inflammatory disease. In some cases, the cancer is a pancreatic cancer, an ovarian cancer, a bladder cancer, a colorectal cancer, a lung cancer, a brain cancer, a prostate cancer, a breast cancer, a skin cancer, a lymphoma, a tongue cancer, a mouth cancer, a pharynx cancer, an

oral cavity cancer, an esophagus cancer, a stomach cancer, a small intestine cancer, a colon cancer, a rectum cancer, an anal cancer, an anorectum cancer, a liver cancer, an intrahepatic bile duct cancer, a gallbladder cancer, a biliary cancer, a digestive organ cancer, a larynx cancer, a bronchus cancer, a respiratory organ cancer, a bone cancer, a joint cancer, a soft tissue cancer, a heart cancer, a melanoma, a nonepithelial skin cancer, a uterine cancer, a cervical cancer, a vulva cancer, a vagina cancer, a penis cancer, a genital cancer, a testis cancer, a kidney cancer, a renal pelvis cancer, a ureter cancer, a urinary organ cancer, an eye cancer, an orbit cancer, a nervous system cancer, an endocrine cancer, a thyroid cancer, a Hodgkin lymphoma, a non-Hodgkin lymphoma, a myeloma, an acute lymphocytic leukemia, a chronic lymphocytic leukemia, an acute myeloid leukemia, a chronic myeloid leukemia, or a leukemia.

[0004] In another aspect, there are provided methods of analysis comprising (a) measuring an amount of an analyte in a biological sample from an individual; and (b) identifying the individual as being at risk of developing a disease when the amount of the analyte is greater than or less than the amount observed in a control sample, wherein the analyte comprises one or more biomarker identified in any of the method provided herein. In some cases, measuring comprises isolating the analytes in the biological sample using an electrode array configured to generate an AC dielectrophoretic field. In some cases, isolating comprises using electrodes configured to generate a dielectrophoretic low field region and a dielectrophoretic high field region. In some cases, isolating comprises capturing the first plurality of analytes or the second plurality of analytes on one or more electrode. In some cases, measuring comprises mass spectrometry analysis of the analyte. In some cases, the analyte comprises a protein or a polypeptide. In some cases, the analyte comprises a nucleic acid. In some cases, the analyte comprises an exosome. In some cases, the disease is a cancer, a neurological disease, an infection, or an inflammatory disease. In some cases, the cancer is a pancreatic cancer, an ovarian cancer, a bladder cancer, a colorectal cancer, a lung cancer, a brain cancer, a prostate cancer, a breast cancer, a skin cancer, a lymphoma, or a leukemia.

[0005] A further aspect, there are provided methods of identifying a therapeutic target, the method comprising: (a) isolating a first plurality of analytes in a first biological sample of an individual known to have the disease state using an electrode array configured to generate an AC dielectrophoretic field; (b) isolating a second plurality of analytes in a second biological sample of healthy individual using an electrode configured to generate an AC dielectrophoretic field; and (c) identifying a subset of the first plurality of analytes, wherein the subset is quantitatively different in the first biological sample compared with the second biological sample, wherein the subset is identified as the therapeutic target for drug discovery or drug development.

INCORPORATION BY REFERENCE

[0006] All publications, patents, and patent applications mentioned in this specification are herein incorporated by reference to the same extent as if each individual publication, patent, or patent application was specifically and individually indicated to be incorporated by reference.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] The patent or application file contains at least one drawing executed in color. Copies of this patent or patent application publication with color drawings(s) will be provided by the Office upon request and payment of the necessary fee.

[0008] The novel features of the invention are set forth with particularity in the appended claims. A better understanding of the features and advantages of the present invention will be obtained by reference to the following detailed description that sets forth illustrative embodiments, in which the principles of the invention are utilized, and the accompanying drawings of which:

[0009] **FIG. 1** shows (left) a tilted top view of an assay cartridge; (center) a visualization of blood cells separated from the sample away from the electrodes; and (left) a visualization of DNA and extracellular vesicles on the electrode.

[0010] **FIG. 2** shows a workflow for biomarker analysis: (left) biomarkers isolated on an electrode, (center) various biomarkers to be analyzed; and (right) modalities for downstream analysis either off chip or on chip.

[0011] **FIG. 3** shows an example of a method for isolating nucleic acids from cells.

[0012] **FIG. 4** shows an example of a method for isolating extra-cellular nucleic acids from a fluid comprising cells.

[0013] **FIG. 5** shows a flow diagram for biomarker discovery.

[0014] **FIG. 6** shows (left) a cluster diagram of exosomal proteins isolated from pancreatic cancer patients (right) a heat map of biomarkers over expressed and under expressed in pancreatic cancer compared with healthy control.

[0015] **FIG. 7** shows the subjects used in a multi-cancer test using samples from known cancer patients and healthy controls.

[0016] **FIG. 8** shows results of a multicancer test using samples from known cancer patients and healthy controls.

[0017] **FIGS. 9A-9C** show an experimental outline. **FIG. 9A** shows a workflow diagram. **FIG. 9B** shows a statistical approach to develop and evaluate performance of the EXPLORE test: 100 iterations of randomly selected subjects were used for development (training set, 67% of subjects) and performance evaluation (test set, 33% of subjects). **FIG. 9C** shows relative concentration of 13 exoproteins used in the EXPLORE test by subject ID. The concentration levels were normalized to

the highest concentration observed for each biomarker, with lowest expression depicted in white and highest expression in green.

[0018] **FIGS. 10A-10C** show performance of the EXPLORE test. **FIG. 10A** shows a ROC curve, cancer cohort to healthy controls: the black line represents the average curve of 100 iterations (gray lines). The red diamond denotes 99% specificity. **FIG. 10B** shows proportion of correctly classified cancer patients (sensitivity) by stage at >99% specificity. **FIG. 10C** shows proportion of detected cancer patients (sensitivity) based on cancer type at >99% specificity. Error bars indicate 95% confidence intervals.

[0019] **FIGS. 11A-11C** show EXPLORE Test Proportion Detected at >99% (Top), 97% (Middle) and 95% (Bottom) for Cancer Subtypes. **FIG. 11A** shows pancreatic ductal adenocarcinoma proportion detected for 21 stage I (96%, 97%, 98%) and 23 stage II (95%, 96%, 97%). **FIG. 11B** shows ovarian cancer proportion detected for 37 Stage I (65%, 69%, 76%) and 25 Stage IA patients (66%, 69%, 75%), as well as 22 Stage I & II serous adenocarcinoma patients (69%, 73%, 80%). **FIG. 11C** shows bladder cancer proportion detected for 27 Stage I (56%, 61%, 67%), 15 Low Grade (52%, 58%, 68%), and 33 High Grade (50%, 54%, 62%) in both stages I and II. Each diamond represents the mean, and the error bars represent the 95% confidence interval from the 100 test intervals.

[0020] **FIGS. 12A-12B** show size distribution and particle concentrations of exosomes isolated from healthy controls and cancer patients. **FIG. 12A** shows characterization of exosome samples by NTA analysis for particle size distribution. **FIG. 12B** shows characterization of exosome samples by NTA analysis for particle concentration. Median values and ranges were calculated for healthy controls (green) and cancer patients (red).

[0021] **FIGS. 13A-13B** show heatmaps of normalized concentration values for analyzed proteins for cancer and healthy cohorts. **FIG. 13A** shows a heatmap for exoproteins. **FIG. 13B** shows a heatmap for free proteins. Normalization is across the entire cohort for each marker. Each column represents a subject in the study.

[0022] **FIG. 14** shows waterfall plots of the protein biomarkers used in the assay. values are sorted from high (left) to low (right). each column represents an individual patient sample (red, cancer patient; green, healthy control).

[0023] **FIG. 15** shows EXPLORE test performance using exoproteins and free proteins. ROC curves were generated using the protein concentrations derived from the exo-proteins (black) or free-proteins in plasma (orange). AUROC is shown on the graph for each cohort with 95% confidence intervals.

[0024] **FIGS. 16A-16B** show correlation of protein levels. **FIG. 16A** shows Pearson correlation coefficients for exosomal proteins. **FIG. 16B** shows Pearson correlation coefficients for free proteins.

[0025] **FIG. 17** shows a schematic of EV isolation workflows using AC electrokinetics (ACE) or ultracentrifugation methods. (Top) Workflow using the Verita™ Isolation platform. As plasma samples are flowed onto the energized AC Electrokinetics (ACE) microelectrode array, EVs are collected onto the electrodes. Unbound materials are removed with a buffer wash, the electric field turned off, and EVs are eluted into the buffer. (Bottom) Workflow for differential ultracentrifugation. Plasma samples are diluted, and large debris pelleted by low-speed centrifugation. Supernatants are removed and subjected to 2 additional cycles of low-speed centrifugation. EVs in the cleared supernatants are then ultracentrifuged two times and finally the pellet is resuspended in buffer.

[0026] **FIGS. 18A-18C** show characterization of EVs isolated by ACE or differential ultracentrifugation. **FIG. 18A** shows distribution of particle sizes as determined by nanoparticle tracking analysis. Verita-isolated EVs, shown in blue line; ultracentrifugation-isolated EVs, shown in grey line. **FIG. 18B** show levels of residual contaminating total proteins based on Qubit™ protein assay. **FIG. 18C** shows differentiation between controls (left boxes) and cancer cases (right boxes) shown for biomarkers CA 19-9 and CA 125. Top, EVs isolated using the Verita™ system; bottom, EVs isolated by differential ultracentrifugation.

[0027] **FIG. 19** shows development of a classification algorithm for multi-cancer early detection. Biomarker selection is performed via recursive feature elimination (RFE) with cross validation. After the biomarkers are selected, the dataset is split into training and test sets. The training set is used for determination of the coefficients in the logistic regression for each biomarker and the test set is used to evaluate the performance of the logistic regression fit from the training set in a "hold-out" test set. Finally, the process of splitting the dataset into training and test sets is randomly repeated 100 times for performance confirmation.

[0028] **FIGS. 20A-20C** show overall performance for detecting the presence of early cancer using an EV protein-based logistic classifier. **FIG. 20A** shows ROC curves from comparison of the cancer cases to the controls on the hold-out test sets: the black line represents the average curve of 100 independently resampled hold-out test sets (grey lines). **FIG. 20B** shows sensitivity by stage at > 99% specificity. Left bar represents combined sensitivity for detecting stage I pancreatic, ovarian, and bladder cancers; right bar represents combined sensitivity for detecting stage II for these cancers. **FIG. 20C** shows sensitivity by cancer type at > 99% specificity. Left bar represents sensitivity for detecting stages I and II pancreatic cancer; center bar, stages I and II ovarian cancer,

and right bar, stages I and II bladder cancer. The error bars represent the two-sided 95% Wilson confidence intervals.

[0029] **FIGS. 21A-21C** show sensitivity at > 99% specificity for detecting three cancer types using EV protein biomarkers. **FIG. 21A** shows sensitivity for detecting either stage I or stage II pancreatic cancer. **FIG. 21B** shows sensitivity for detecting either stage I or stage II ovarian cancer. **FIG. 21C** shows sensitivity for detecting either stage I or stage II bladder cancer. Error bars represent the two-sided 95% Wilson confidence intervals.

[0030] **FIGS. 22A-22C** show comparison of NTA results from control and cancer cases. **FIG. 22A** shows particle concentration for Verita-purified EVs. Left box, EVs from control samples; right box, EVs from cancer cases. **FIG. 22B** shows Verita-purified EV particles, particle median size. Left box, EVs from control samples; right box, EVs from cancer cases **FIG. 22C** shows overall particle size distribution for cancers and controls. Top line, EVs from control samples; lower line, EVs from cancer cases.

[0031] **FIGS. 23A-23B** shows a comparison between EVs isolated using Verita™ or Differential Ultracentrifugation. **FIG. 23A** shows particle size distribution shown for controls and for ovarian, bladder, and pancreatic cancer samples. Blue lines, Verita-isolated EVs; grey lines, ultracentrifugation-isolated EVs. **FIG. 23B** shows protein bioanalyzer electropherograms for selected samples. The blue dashed lines show the protein size range for Albumin (50 to 60kDa), the green dashed lines show the same range for Fibrinogen (70-85kDa) and the cyan dash lines show the range for IgG (140-180kDa).

[0032] **FIGS. 24A-24B** shows a heatmap of normalized concentration values for analyzed proteins for cancer and control cases. **FIG. 24A** shows Exo-Proteins. **FIG. 24B** shows Free Proteins. Normalization is across the entire cohort for each marker; each column represents a subject in the study.

[0033] **FIG. 25** shows a comparison of EV protein concentrations for control and cancer cases across all biomarkers selected in the model. Controls, left boxes; cancer cases, right boxes.

[0034] **FIG. 26** shows a Pearson Correlation Coefficients for Biomarkers Selected in the Logistic Classifier Model.

[0035] **FIG. 27** shows ROC Comparison between EV Proteins and Free Proteins. ROC curves were generated using the protein concentrations derived from the exo-proteins (black line) or free proteins (orange line) using the biomarkers selected in the logistic classifier model.

[0036] **FIGS. 28A-28B** show performance of assay using EVs spiked into K2EDTA plasma at known particle concentrations. (A) The concentration of CA 19-9 measured in H1975 EVs at three different particle concentrations shows a linear response with input. The K2EDTA plasma with no

EV spike showed negligible concentration of the marker. (B) Quantitative detection of expected proteins based on the EV type spiked into K2EDTA plasma. H1975 cell EVs, red markers; HeLa cell EVs, blue markers.

[0037] **FIGS. 29A-29B** show Pearson correlation of protein levels. **FIG. 29A** shows EV proteins. **FIG. 29B** shows free proteins.

DETAILED DESCRIPTION

[0038] Metastatic cancer is deadly, for example pancreatic cancer is one of the deadliest with a dismal 5-year survival rate of ~3%.3 Indeed, pancreatic ductal adenocarcinoma (PDAC) will soon become the second leading cause of all cancer-related deaths in the United States. In contrast, for the few patients (11%) diagnosed with localized disease, the 5-year survival rate is ~40%. This large discrepancy in survival between early- and advanced-stage disease is not unique to pancreatic cancer. The 5-year survival rate for metastatic ovarian carcinoma is <31%, versus a remarkable 93% for the ~15% of women with localized disease. Even with surgical management and adjuvant therapy, 80% of women with advanced disease develop recurrence, after which curing the malignancy is no longer an expectation. Similarly, in bladder cancer, detection of the disease that has not spread beyond the inner layer of bladder's wall results in a 5-year survival rate of 96%. Importantly, early detection limits the impact on quality of life, since surgical intervention may entail only a trans-urethral bladder tumor resection, whereas more invasive cancer can require radical removal of the entire bladder.

[0039] As with many other malignancies, there are no approved screening modalities for these three cancers. Several emerging blood-based multi-cancer detection assays attempt to address the early detection of these cancers by combining machine learning with DNA mutation/methylation and/or protein biomarkers. However, at the specificity (>99%) needed for implementation of widespread screening, many of these tests demonstrated sensitivities as low as 0% for stage I-II cancers (Liu, M.C., et al. Sensitive and specific multi-cancer detection and localization using methylation signatures in cell-free DNA. Annals of Oncology 31, 745-759 (2020); Cohen, J.D., et al. Detection and localization of surgically resectable cancers with a multi-analyte blood test. Science 359, 926-930 (2018)). Recently, proteins bound to exosomes (extracellular vesicles that mediate cell-to-cell communication) were shown to be promising biomarkers for identification of lung and pancreatic cancers (Hoshino, A., et al. Extracellular Vesicle and Particle Biomarkers Define Multiple Human Cancers. Cell 182, 1044-1061.e1018 (2020)). However, the exosome isolation required a one-day cumbersome ultracentrifugation process. Methods provided herein comprise use of exosomes isolated using an alternating current electrokinetic-based platform –

Verita™ (Hinestrosa, J.P., et al. Simultaneous Isolation of Circulating Nucleic Acids and EV-Associated Protein Biomarkers From Unprocessed Plasma Using an AC Electrokinetics-Based Platform. Frontiers in Bioengineering and Biotechnology 8(2020)) and probed exosome-borne proteins (exo-proteins), enabling detection of pancreatic and brain cancers with a <2hr workflow.

[0040] Provided herein are systems and methods that utilize circulating markers, such as, proteins associated with plasma exosomes, for use in a multi-cancer detection test for identification of stage I and II cancers. In some cases, methods herein are useful for detection of pancreatic, ovarian, and bladder cancers. In some cases, methods herein are useful in detecting cancers where early detection would provide high clinical value. Methods herein show a reliable detection of early-stage disease, in some cases, with an area under the curve (AUC) of 0.95 (95% Confidence Interval (CI) = 0.94-0.97). In some cases, at 99% specificity, the proportions of detected stage I disease reached 97% in pancreatic, 65% in ovarian (66% in Stage IA) and 56% in bladder cancers.

[0041] Provided herein are systems and methods for discovery of biomarkers associated with a disease state.

[0042] Also provided herein are a plurality of biomarkers useful for identifying an individual at risk of disease or a prognosis or progression of the disease in the individual.

[0043] In some aspects, the method, device or system includes the isolation and/or identification of biomarkers from a biological complex, for example vesicles such as extracellular vesicles, exosomes, microvesicles, enveloped-particles, and other complex particles or biological parcels that include a combination of biological components, including DNA, RNA, proteins, lipids and other biological molecules. In some aspects, the method, device or systems described herein isolate biomarkers (*e.g.*, DNA, RNA, nucleosomes, proteins or cell membrane fragments) from exosomes isolated from a biological sample.

[0044] In some embodiments, the method, device, or system further includes one or more of the following steps: concentrating exosomes in a first dielectrophoretic field region (*e.g.*, a high field DEP region), and isolating a biomarker (*e.g.*, DNA, RNA, nucleosomes, proteins, or cell membrane fragments) from exosomes. In other embodiments, the method, device, or system includes one or more of the following steps: concentrating larger particulates (*e.g.*, cells) in a first dielectrophoretic field region (*e.g.*, a low field DEP region), concentrating exosomes in a second dielectrophoretic field region (*e.g.*, a high field DEP region), washing away the cells and residual material, and isolating biomarkers from the exosomes. The method also optionally includes devices and/or systems capable of performing one or more of the following steps: washing or otherwise removing residual (*e.g.*, cellular) material from the exosomes (*e.g.*, rinsing the array with water or buffer while the exosomes are concentrated and maintained within a high field DEP region of the array),

optionally degrading residual proteins (*e.g.*, residual proteins from lysed cells and/or other sources, such degradation occurring according to any suitable mechanism, such as with heat, a protease, or a chemical), flushing degraded proteins from the nucleic acid, and collecting the exosomes. In some embodiments, the result of the methods, operation of the devices, and operation of the systems described herein is an isolated particulate (*e.g.*, exosomes comprising DNA, RNA, nucleosomes, proteins, cell membrane fragments), optionally of suitable quantity and purity for further analysis (*e.g.*, mass spectroscopy, DNA sequencing).

[0045] An example workflow is shown in FIG. 2. Biomarkers of a predetermined size range are isolated using dielectrophoresis, analytes captured include but are not limited to exosomes, (including exosomal proteins, RNA and exosomal DNA), cell-free DNA, methylation markers, and/or plasma proteins. Isolated biomarkers are either analyzed after being eluted from the chip or being detected on the chip. A more detailed workflow is shown in FIG. 5. Samples from patients of various disease states, including but not limited to, cancer, neurological disease, or infectious disease, are analyzed by isolating extracellular vesicles (or exosomes) and cell free DNA. Nucleic acids from the extracellular vesicles and the cell-free DNA are analyzed by genomic profiling. Proteins from the extracellular vesicles are analyzed using proteomic methods. Analysis of these analytes and analytes from healthy controls will be analyzed, in some cases using machine learning or deep learning algorithms to discover new biomarkers. Analysis of biomarkers may involve functional clustering and expression comparison (*e.g.*, heat maps) as shown in FIG. 6.

[0046] In some instances, it is advantageous that the methods described herein are performed in a short amount of time, the devices are operated in a short amount of time, and the systems are operated in a short amount of time. In some embodiments, the period of time is short with reference to the "procedure time" measured from the time between adding the fluid to the device and obtaining isolated nucleic acid. In some embodiments, the procedure time is less than 3 hours, less than 2 hours, less than 1 hour, less than 30 minutes, less than 20 minutes, less than 10 minutes, or less than 5 minutes.

[0047] In another aspect, the period of time is short with reference to the "hands-on time" measured as the cumulative amount of time that a person must attend to the procedure from the time between adding the fluid to the device and obtaining isolated exosomes. In some embodiments, the hands-on time is less than 40 minutes, less than 20 minutes, less than 10 minutes, less than 5 minutes, less than 1 minute, or less than 30 seconds.

[0048] In some instances, it is advantageous that the devices described herein comprise a single vessel, the systems described herein comprise a device comprising a single vessel and the methods described herein can be performed in a single vessel, *e.g.*, in a dielectrophoretic device as described

herein. In some aspects, such a single-vessel embodiment minimizes the number of fluid handling steps and/or is performed in a short amount of time. In some instances, the present methods, devices and systems are contrasted with methods, devices and systems that use one or more centrifugation steps and/or medium exchanges. In some instances, centrifugation increases the amount of hands-on time required to isolate an analyte or biomarker from exosomes including but not limited to DNA, RNA, nucleosomes, proteins, and/or cell membrane fragments. In another aspect, the single-vessel procedure or device isolates analytes or biomarkers from exosomes (*e.g.* DNA, RNA, nucleosomes, proteins, and/or cell membrane fragments) using a minimal amount of consumable reagents.

Devices and Systems

[0049] In some embodiments, described herein are devices for collecting exosome derived biomarkers from a fluid. In one aspect, described herein are devices for collecting a biomarker from a fluid comprising cells, from a cell-free portion of a fluid, or other particulate material.

[0050] In some embodiments, disclosed herein is a device for isolating cellular material, the device comprising: a. a housing; b. a heater or thermal source and/or a reservoir comprising a protein degradation agent; and c. a plurality of alternating current (AC) electrodes within the housing, the AC electrodes configured to be selectively energized to establish AC electrokinetic high field and AC electrokinetic low field regions, whereby AC electrokinetic effects provide for concentration of cells in low field regions of the device. In some embodiments, the plurality of electrodes is configured to be selectively energized to establish a dielectrophoretic high field and dielectrophoretic low field regions. In some embodiments, the protein degradation agent is a protease. In some embodiments, the protein degradation agent is Proteinase K. In some embodiments, the device further comprises a second reservoir comprising an eluant.

[0051] In some embodiments, disclosed herein is a device comprising: a. a plurality of alternating current (AC) electrodes, the AC electrodes configured to be selectively energized to establish AC electrokinetic high field and AC electrokinetic low field regions; and b. a module capable of thermocycling and performing PCR or other enzymatic reactions.

[0052] In some embodiments, disclosed herein is a device comprising: a. a plurality of alternating current (AC) electrodes, the AC electrodes configured to be selectively energized to establish AC electrokinetic high field and AC electrokinetic low field regions; and b. a module capable of imaging the material captured or isolated by the AC electrodes. Some embodiments also include chambers and fluidics for adding reagents and removing that allow for the visualization of the captured materials.

[0053] In some embodiments, the plurality of electrodes is configured to be selectively energized to establish a dielectrophoretic high field and dielectrophoretic low field regions. In some embodiments, the device is capable of isolating DNA, including cell-free DNA and DNA fragments, RNA, nucleosomes, exosomes, extracellular vesicles, proteins, cell membrane fragments, mitochondria and cellular vesicles from a biological sample comprising fluid. In some embodiments, the device is capable of isolating these materials from cells in the biological sample. In some embodiments, the device is capable of performing PCR amplification or other enzymatic reactions. In some embodiments, DNA is isolated and PCR or other enzymatic reaction is performed in a single chamber. In some embodiments, DNA is isolated and PCR or other enzymatic reaction is performed in multiple regions of a single chamber. In some embodiments, DNA is isolated and PCR or other enzymatic reaction is performed in multiple chambers. In some embodiments, a biomarker is eluted from the device for further analysis (*e.g.*, mass spectroscopy).

[0054] In some embodiments, the device further comprises at least one of an elution tube, a chamber and a reservoir to perform PCR amplification or other enzymatic reaction. In some embodiments, PCR amplification or other enzymatic reaction is performed in a serpentine microchannel comprising a plurality of temperature zones. In some embodiments, PCR amplification or other enzymatic reaction is performed in aqueous droplets entrapped in immiscible fluids (i.e., digital PCR). In some embodiments, the thermocycling comprises convection. In some embodiments, the device comprises a surface contacting or proximal to the electrodes, wherein the surface is functionalized with biological ligands that are capable of selectively capturing biomolecules.

[0055] In some embodiments, disclosed herein is a system for isolating a cellular material from a biological sample, the system comprising: a. a device comprising a plurality of alternating current (AC) electrodes, the AC electrodes configured to be selectively energized to establish AC electrokinetic high field and AC electrokinetic low field regions, whereby AC electrokinetic effects provide for concentration of cells in high field regions of the device; and b. a sequencer, thermocycler or other device for performing enzymatic reactions on isolated or collected nucleic acid. In some embodiments, the plurality of electrodes is configured to be selectively energized to establish a dielectrophoretic high field and dielectrophoretic low field regions.

[0056] In various embodiments, DEP fields are created or capable of being created by selectively energizing an array of electrodes as described herein. The electrodes are optionally made of any suitable material resistant to corrosion, including metals, such as noble metals (*e.g.* platinum, platinum iridium alloy, palladium, gold, and the like). In various embodiments, electrodes are of any suitable size, of any suitable orientation, of any suitable spacing, energized or capable of being

energized in any suitable manner, and the like such that suitable DEP and/or other electrokinetic fields are produced.

[0057] In some embodiments described herein are methods, devices and systems in which the electrodes are placed into separate chambers and positive DEP regions and negative DEP regions are created within an inner chamber by passage of the AC DEP field through pore or hole structures. Various geometries are used to form the desired positive DEP (high field) regions and DEP negative (low field) regions for carrying cellular, microparticle, nanoparticle, and nucleic acid separations. In some embodiments, pore or hole structures contain (or are filled with) porous material (hydrogels) or are covered with porous membrane structures. In some embodiments, by segregating the electrodes into separate chambers, such pore/hole structure DEP devices reduce electrochemistry effects, heating, or chaotic fluidic movement from occurring in the inner separation chamber during the DEP process.

[0058] In one aspect, described herein is a device comprising electrodes, wherein the electrodes are placed into separate chambers and DEP fields are created within an inner chamber by passage through pore structures. The exemplary device includes a plurality of electrodes and electrode-containing chambers within a housing. A controller of the device independently controls the electrodes, as described further in PCT patent publication WO 2009/146143 A2, which is incorporated herein for such disclosure.

[0059] In some embodiments, chambered devices are created with a variety of pore and/or hole structures (nanoscale, microscale and even macroscale) and contain membranes, gels or filtering materials which control, confine or prevent cells, nanoparticles or other entities from diffusing or being transported into the inner chambers while the AC/DC electric fields, solute molecules, buffer and other small molecules can pass through the chambers.

[0060] In various embodiments, a variety of configurations for the devices are possible. For example, a device comprising a larger array of electrodes, for example in a square or rectangular pattern configured to create a repeating non-uniform electric field to enable AC electrokinetics. For illustrative purposes only, a suitable electrode array may include, but is not limited to, a 10x10 electrode configuration, a 50x50 electrode configuration, a 10x100 electrode configuration, a 20x100 electrode configuration, or a 20x80 electrode configuration.

[0061] Such devices include, but are not limited to, multiplexed electrode and chambered devices, devices that allow reconfigurable electric field patterns to be created, devices that combine DC electrophoretic and fluidic processes; sample preparation devices, sample preparation, enzymatic manipulation of isolated nucleic acid molecules and diagnostic devices that include

subsequent detection and analysis, lab-on-chip devices, point-of-care and other clinical diagnostic systems or versions.

[0062] In some embodiments, a planar platinum electrode array device comprises a housing through which a sample fluid flows. In some embodiments, fluid flows from an inlet end to an outlet end, optionally comprising a lateral analyte outlet. The exemplary device includes multiple AC electrodes. In some embodiments, the sample consists of a combination of micron-sized entities or cells, larger nanoparticulates and smaller nanoparticulates or biomolecules. In some instances, the larger nanoparticulates are cellular debris dispersed in the sample. In some embodiments, the smaller nanoparticulates are proteins, smaller DNA, RNA and cellular fragments. In some embodiments, the planar electrode array device is a 60x20 electrode array that is optionally sectioned into three 20x20 arrays that can be separately controlled but operated simultaneously. The optional auxiliary DC electrodes can be switched on to positive charge, while the optional DC electrodes are switched on to negative charge for electrophoretic purposes. In some instances, each of the controlled AC and DC systems is used in both a continuous and/or pulsed manner (*e.g.*, each can be pulsed on and off at relatively short time intervals) in various embodiments. The optional planar electrode arrays along the sides of the sample flow, when over-layered with nanoporous material (*e.g.*, a hydrogel of synthetic polymer), are optionally used to generate DC electrophoretic forces as well as AC DEP. Additionally, microelectrophoretic separation processes is optionally carried out within the nanopore layers using planar electrodes in the array and/or auxiliary electrodes in the x-y-z dimensions.

[0063] In various embodiments these methods, devices and systems are operated in the AC frequency range of from 1,000 Hz to 100 MHz, at voltages which could range from approximately 1 volt to 2000 volts pk-pk; at DC voltages from 1 volt to 1000 volts, at flow rates of from 10 microliters per minute to 10 milliliter per minute, and in temperature ranges from 1 °C to 120 °C. In some embodiments, the methods, devices and systems are operated in AC frequency ranges of from about 3 to about 15 kHz. In some embodiments, the methods, devices, and systems are operated at voltages of from 5-25 volts pk-pk. In some embodiments, the methods, devices and systems are operated at voltages of from about 1 to about 50 volts/cm. In some embodiments, the methods, devices and systems are operated at DC voltages of from about 1 to about 5 volts. In some embodiments, the methods, devices and systems are operated at a flow rate of from about 10 microliters to about 500 microliters per minute. In some embodiments, the methods, devices and systems are operated in temperature ranges of from about 20 °C to about 60 °C. In some embodiments, the methods, devices and systems are operated in AC frequency ranges of from 1,000 Hz to 10 MHz. In some embodiments, the methods, devices and systems are operated in AC

frequency ranges of from 1,000 Hz to 1 MHz. In some embodiments, the methods, devices and systems are operated in AC frequency ranges of from 1,000 Hz to 100 kHz. In some embodiments, the methods, devices and systems are operated in AC frequency ranges of from 1,000 Hz to 10 kHz. In some embodiments, the methods, devices and systems are operated in AC frequency ranges of from 10 kHz to 100 kHz. In some embodiments, the methods, devices and systems are operated in AC frequency ranges of from 100 kHz to 1 MHz. In some embodiments, the methods, devices and systems are operated at voltages from approximately 1 volt to 1500 volts pk-pk. In some embodiments, the methods, devices and systems are operated at voltages from approximately 1 volt to 1500 volts pk-pk. In some embodiments, the methods, devices and systems are operated at voltages from approximately 1 volt to 1000 volts pk-pk. In some embodiments, the methods, devices and systems are operated at voltages from approximately 1 volt to 500 volts pk-pk. In some embodiments, the methods, devices and systems are operated at voltages from approximately 1 volt to 250 volts pk-pk. In some embodiments, the methods, devices and systems are operated at voltages from approximately 1 volt to 100 volts pk-pk. In some embodiments, the methods, devices and systems are operated at voltages from approximately 1 volt to 50 volts pk-pk. In some embodiments, the methods, devices and systems are operated at DC voltages from 1 volt to 1000 volts. In some embodiments, the methods, devices and systems are operated at DC voltages from 1 volt to 500 volts. In some embodiments, the methods, devices and systems are operated at DC voltages from 1 volt to 250 volts. In some embodiments, the methods, devices and systems are operated at DC voltages from 1 volt to 100 volts. In some embodiments, the methods, devices and systems are operated at DC voltages from 1 volt to 50 volts. In some embodiments, the methods, devices, and systems are operated at flow rates of from 10 microliters per minute to 1 ml per minute. In some embodiments, the methods, devices, and systems are operated at flow rates of from 0.1 microliters per minute to 500 microliters per minute. In some embodiments, the methods, devices, and systems are operated at flow rates of from 0.1 microliters per minute to 250 microliters per minute. In some embodiments, the methods, devices, and systems are operated at flow rates of from 0.1 microliters per minute to 100 microliters per minute. In some embodiments, the methods, devices, and systems are operated in temperature ranges from 1 °C to 100 °C. In some embodiments, the methods, devices, and systems are operated in temperature ranges from 20 °C to 95°C. In some embodiments, the methods, devices, and systems are operated in temperature ranges from 25 °C to 100 °C. In some embodiments, the methods, devices, and systems are operated at room temperature.

[0064] In some embodiments, the controller independently controls each of the electrodes. In some embodiments, the controller is externally connected to the device such as by a socket and plug connection, or is integrated with the device housing.

[0065] Also described herein are scaled sectioned (x-y dimensional) arrays of robust electrodes and strategically placed (x-y-z dimensional) arrangements of auxiliary electrodes that combine DEP, electrophoretic, and fluidic forces, and use thereof. In some embodiments, clinically relevant volumes of blood, serum, plasma, or other samples are more directly analyzed under higher ionic strength and/or conductance conditions. Described herein is the overlaying of robust electrode structures (*e.g.* platinum, palladium, gold, etc.) with one or more porous layers of materials (natural or synthetic porous hydrogels, membranes, controlled nanopore materials, and thin dielectric layered materials) to reduce the effects of any electrochemistry (electrolysis) reactions, heating, and chaotic fluid movement that may occur on or near the electrodes, and still allow the effective separation of cells, bacteria, virus, nanoparticles, exosomes, DNA, RNA, nucleosomes, extracellular vesicles, proteins, cell membrane fragments, mitochondria and cellular vesicles, and other biomolecules to be carried out. In some embodiments, in addition to using AC frequency cross-over points to achieve higher resolution separations, on-device (on-array) DC microelectrophoresis is used for secondary separations. For example, the separation of DNA nanoparticulates (20-50 kb), high molecular weight DNA (5-20 kb), intermediate molecular weight DNA (1-5 kb), and lower molecular weight DNA (0.1 -1kb) fragments may be accomplished through DC microelectrophoresis on the array. In some embodiments, the device is sub-sectioned, optionally for purposes of concurrent separations of different blood cells, bacteria and virus, and DNA carried out simultaneously on such a device.

[0066] In some embodiments, the device comprises a housing and a heater or thermal source and/or a reservoir comprising a protein degradation agent. In some embodiments, the heater or thermal source is capable of increasing the temperature of the fluid to a desired temperature (*e.g.*, to a temperature suitable for degrading proteins, about 30 °C, 40 °C, 50 °C, 60 °C, 70 °C, or the like). In some embodiments, the heater or thermal source is suitable for operation as a PCR thermocycler. IN other embodiments, the heater or thermal source is used to maintain a constant temperature (isothermal conditions). In some embodiments, the protein degradation agent is a protease. In other embodiments, the protein degradation agent is Proteinase K and the heater or thermal source is used to inactivate the protein degradation agent.

[0067] In some embodiments, the device also comprises a plurality of alternating current (AC) electrodes within the housing, the AC electrodes capable of being configured to be selectively energized to establish dielectrophoretic (DEP) high field and dielectrophoretic (DEP) low field

regions, whereby AC electrokinetic effects provide for concentration of cells in low field regions of the device. In some embodiments, the electrodes are selectively energized to provide the first AC electrokinetic field region and subsequently or continuously selectively energized to provide the second AC electrokinetic field region. For example, further description of the electrodes and the concentration of cells in DEP fields is found in PCT patent publication WO 2009/146143 A2, which is incorporated herein for such disclosure.

[0068] In some embodiments, the device comprises a second reservoir comprising an eluant. The eluant is any fluid suitable for eluting the isolated cellular material from the device. In some instances the eluant is water or a buffer. In some instances, the eluant comprises reagents required for a DNA sequencing method. In some cases, the eluant comprises reagents required for a mass spectroscopy method.

[0069] In some embodiments, the device comprises a plurality of reservoirs, each reservoir containing a reagents useful in the staining and washing of the isolated cellular material in the device. Examples include antibodies, oligonucleotides, probes, and dyes, buffers, washes, water, detergents, and solvents.

[0070] Also provided herein are systems and devices comprising a plurality of alternating current (AC) electrodes, the AC electrodes configured to be selectively energized to establish dielectrophoretic (DEP) high field and dielectrophoretic (DEP) low field regions. In some instances, AC electrokinetic effects provide for concentration of cells in low field regions and/or concentration (or collection or isolation) of molecules (*e.g.*, macromolecules, such as nucleic acid) in high field regions of the DEP field.

[0071] Also provided herein are systems and devices comprising a pluarilty of direct current (DC) electrodes. In some embodiments, the plurality of DC electrodes comprises at least two rectangular electrodes, spread throughout the array. In some embodiments, the electrodes are located at the edges of the array. In some embodiments, DC electrodes are interspersed between AC electrodes.

[0072] In some embodiments, a system or device described herein comprises a means for manipulating nucleic acid. In some embodiments, a system or device described herein includes a means of performing enzymatic reactions. In other embodiments, a system or device described herein includes a means of performing polymerase chain reaction, isothermal amplification, ligation reactions, restriction analysis, nucleic acid cloning, transcription or translation assays, or other enzymatic-based molecular biology assay.

[0073] In some embodiments, a system or device described herein comprises a nucleic acid sequencer. The sequencer is optionally any suitable DNA sequencing device including but not

limited to a Sanger sequencer, pyro-sequencer, ion semiconductor sequencer, polony sequencer, sequencing by ligation device, DNA nanoball sequencing device, or single molecule sequencing device.

[0074] In some embodiments, a system or device described herein is capable of maintaining a constant temperature. In some embodiments, a system or device described herein is capable of cooling the array or chamber. In some embodiments, a system or device described herein is capable of heating the array or chamber. In some embodiments, a system or device described herein comprises a thermocycler. In some embodiments, the devices disclosed herein comprises a localized temperature control element. In some embodiments, the devices disclosed herein are capable of both sensing and controlling temperature.

[0075] In some embodiments, the devices further comprise heating or thermal elements. In some embodiments, a heating or thermal element is localized underneath an electrode. In some embodiments, the heating or thermal elements comprise a metal. In some embodiments, the heating or thermal elements comprise tantalum, aluminum, tungsten, or a combination thereof. Generally, the temperature achieved by a heating or thermal element is proportional to the current running through it. In some embodiments, the devices disclosed herein comprise localized cooling elements. In some embodiments, heat resistant elements are placed directly under the exposed electrode array. In some embodiments, the devices disclosed herein are capable of achieving and maintaining a temperature between about 20 °C and about 120 °C. In some embodiments, the devices disclosed herein are capable of achieving and maintaining a temperature between about 30 °C and about 100 °C. In other embodiments, the devices disclosed herein are capable of achieving and maintaining a temperature between about 20°C and about 95°C. In some embodiments, the devices disclosed herein are capable of achieving and maintaining a temperature between about 25 °C and about 90 °C, between about 25 °C and about 85 °C, between about 25 °C and about 75 °C, between about 25 °C and about 65 °C or between about 25 °C and about 55 °C. In some embodiments, the devices disclosed herein are capable of achieving and maintaining a temperature of about 20° C, about 30° C, about 40° C, about 50 °C, about 60 °C, about 70 °C, about 80 °C, about 90 °C, about 100 °C, about 110 °C or about 120 °C.

[0076] An example device is shown in FIG. 1 with the cartridge having the DEP electrodes in the left panel. A visualization of the electrodes after separation shows blood cells clustering away from the electrodes (center panel). The DNA and extracellular vesicles are seen in the right panel accumulating on the electrode.

Electrodes

[0077] The plurality of alternating current electrodes are optionally configured in any manner suitable for the separation processes described herein. For example, further description of the system or device including electrodes and/or concentration of cells in DEP fields is found in PCT patent publication WO 2009/146143, which is incorporated herein for such disclosure.

[0078] In some embodiments, the electrodes disclosed herein can comprise any suitable metal. In some embodiments, the electrodes can include but are not limited to: aluminum, copper, carbon, iron, silver, gold, palladium, platinum, iridium, platinum iridium alloy, ruthenium, rhodium, osmium, tantalum, titanium, tungsten, polysilicon, and indium tin oxide, or combinations thereof, as well as silicide materials such as platinum silicide, titanium silicide, gold silicide, or tungsten silicide. In some embodiments, the electrodes can comprise a conductive ink capable of being screen-printed.

[0079] In some embodiments, the edge to edge (E2E) to diameter ratio of an electrode is about 0.5 mm to about 5 mm. In some embodiments, the E2E to diameter ratio is about 1 mm to about 4 mm. In some embodiments, the E2E to diameter ratio is about 1 mm to about 3 mm. In some embodiments, the E2E to diameter ratio is about 1 mm to about 2 mm. In some embodiments, the E2E to diameter ratio is about 2 mm to about 5 mm. In some embodiments, the E2E to diameter ratio is about 1 mm. In some embodiments, the E2E to diameter ratio is about 2 mm. In some embodiments, the E2E to diameter ratio is about 3 mm. In some embodiments, the E2E to diameter ratio is about 4 mm. In some embodiments, the E2E to diameter ratio is about 5 mm.

[0080] In some embodiments, the electrodes disclosed herein are dry-etched. In some embodiments, the electrodes are wet etched. In some embodiments, the electrodes undergo a combination of dry etching and wet etching.

[0081] In some embodiments, each electrode is individually site-controlled.

[0082] In some embodiments, an array of electrodes is controlled as a unit.

[0083] In some embodiments, a passivation layer is employed. In some embodiments, a passivation layer can be formed from any suitable material known in the art. In some embodiments, the passivation layer comprises silicon nitride. In some embodiments, the passivation layer comprises silicon dioxide. In some embodiments, the passivation layer has a relative electrical permittivity of from about 2.0 to about 8.0. In some embodiments, the passivation layer has a relative electrical permittivity of from about 3.0 to about 8.0, about 4.0 to about 8.0 or about 5.0 to about 8.0. In some embodiments, the passivation layer has a relative electrical permittivity of about 2.0 to about 4.0. In some embodiments, the passivation layer has a relative electrical permittivity of from about 2.0 to about 3.0. In some embodiments, the

passivation layer has a relative electrical permittivity of about 2.0, about 2.5, about 3.0, about 3.5 or about 4.0.

[0084] In some embodiments, the passivation layer is between about 0.1 microns and about 10 microns in thickness. In some embodiments, the passivation layer is between about 0.5 microns and 8 microns in thickness. In some embodiments, the passivation layer is between about 1.0 micron and 5 microns in thickness. In some embodiments, the passivation layer is between about 1.0 micron and 4 microns in thickness. In some embodiments, the passivation layer is between about 1.0 micron and 3 microns in thickness. In some embodiments, the passivation layer is between about 0.25 microns and 2 microns in thickness. In some embodiments, the passivation layer is between about 0.25 microns and 1 micron in thickness.

[0085] In some embodiments, the passivation layer is comprised of any suitable insulative low k dielectric material, including but not limited to silicon nitride or silicon dioxide. In some embodiments, the passivation layer is chosen from the group consisting of polyamids, carbon, doped silicon nitride, carbon doped silicon dioxide, fluorine doped silicon nitride, fluorine doped silicon dioxide, porous silicon dioxide, or any combinations thereof. In some embodiments, the passivation layer can comprise a dielectric ink capable of being screen-printed.

Electrode Geometry

[0086] In some embodiments, the electrodes disclosed herein can be arranged in any manner suitable for practicing the methods disclosed herein.

[0087] In some embodiments, the electrodes are in a dot configuration, *e.g.* the electrodes comprises a generally circular or round configuration. In some embodiments, the angle of orientation between dots is from about 25° to about 60°. In some embodiments, the angle of orientation between dots is from about 30° to about 55°. In some embodiments, the angle of orientation between dots is from about 30° to about 50°. In some embodiments, the angle of orientation between dots is from about 35° to about 45°. In some embodiments, the angle of orientation between dots is about 25°. In some embodiments, the angle of orientation between dots is about 30°. In some embodiments, the angle of orientation between dots is about 35°. In some embodiments, the angle of orientation between dots is about 40°. In some embodiments, the angle of orientation between dots is about 45°. In some embodiments, the angle of orientation between dots is about 50°. In some embodiments, the angle of orientation between dots is about 55°. In some embodiments, the angle of orientation between dots is about 60°.

[0088] In some embodiments, the electrodes are in a substantially elongated configuration.

[0089] In some embodiments, the electrodes are in a configuration resembling wavy or nonlinear lines. In some embodiments, the array of electrodes is in a wavy or nonlinear line configuration,

wherein the configuration comprises a repeating unit comprising the shape of a pair of dots connected by a linker, wherein the dots and linker define the boundaries of the electrode, wherein the linker tapers inward towards or at the midpoint between the pair of dots, wherein the diameters of the dots are the widest points along the length of the repeating unit, wherein the edge to edge distance between a parallel set of repeating units is equidistant, or roughly equidistant. In some embodiments, the electrodes are strips resembling wavy lines, as depicted in FIG. 8. In some embodiments, the edge to edge distance between the electrodes is equidistant, or roughly equidistant throughout the wavy line configuration. In some embodiments, the use of wavy line electrodes, as disclosed herein, lead to an enhanced DEP field gradient.

[0090] In some embodiments, the electrodes disclosed herein are in a planar configuration. In some embodiments, the electrodes disclosed herein are in a non-planar configuration.

[0091] In some embodiments, the devices disclosed herein surface selectively captures biomolecules on its surface. For example, the devices disclosed herein may capture biomolecules, such as nucleic acids, by, for example, a. nucleic acid hybridization; b. antibody - antigen interactions; c. biotin - avidin interactions; d. ionic or electrostatic interactions; or e. any combination thereof. The devices disclosed herein, therefore, may incorporate a functionalized surface which includes capture molecules, such as complementary nucleic acid probes, antibodies or other protein captures capable of capturing biomolecules (such as nucleic acids), biotin or other anchoring captures capable of capturing complementary target molecules such as avidin, capture molecules capable of capturing biomolecules (such as nucleic acids) by ionic or electrostatic interactions, or any combination thereof.

[0092] In some embodiments, the surface is functionalized to minimize and/or inhibit nonspecific binding interactions by: a. polymers (*e.g.*, polyethylene glycol PEG); b. ionic or electrostatic interactions; c. surfactants; or d. any combination thereof. In some embodiments, the methods disclosed herein include use of additives which reduce non-specific binding interactions by interfering in such interactions, such as Tween 20 and the like, bovine serum albumin, nonspecific immunoglobulins, etc.

[0093] In some embodiments, the device comprises a plurality of microelectrode devices oriented (a) flat side by side, (b) facing vertically, or (c) facing horizontally. In other embodiments, the electrodes are in a sandwiched configuration, *e.g.* stacked on top of each other in a vertical format.

Hydrogels

[0094] Overlaying electrode structures with one or more layers of materials can reduce the deleterious electrochemistry effects, including but not limited to electrolysis reactions, heating, and chaotic fluid movement that may occur on or near the electrodes, and still allow the effective

separation of cells, bacteria, virus, nanoparticles, DNA, and other biomolecules to be carried out. In some embodiments, the materials layered over the electrode structures may be one or more porous layers. In other embodiments, the one or more porous layers is a polymer layer. In other embodiments, the one or more porous layers is a hydrogel.

[0095] In general, the hydrogel should have sufficient mechanical strength and be relatively chemically inert such that it will be able to endure the electrochemical effects at the electrode surface without disconfiguration or decomposition. In general, the hydrogel is sufficiently permeable to small aqueous ions, but keeps biomolecules away from the electrode surface.

[0096] In some embodiments, the hydrogel is a single layer, or coating.

[0097] In some embodiments, the hydrogel comprises a gradient of porosity, wherein the bottom of the hydrogel layer has greater porosity than the top of the hydrogel layer.

[0098] In some embodiments, the hydrogel comprises multiple layers or coatings. In some embodiments, the hydrogel comprises two coats. In some embodiments, the hydrogel comprises three coats. In some embodiments, the bottom (first) coating has greater porosity than subsequent coatings. In some embodiments, the top coat is has less porosity than the first coating. In some embodiments, the top coat has a mean pore diameter that functions as a size cut-off for particles of greater than 100 picometers in diameter.

[0099] In some embodiments, the hydrogel has a conductivity from about 0.001 S/m to about 10 S/m. In some embodiments, the hydrogel has a conductivity from about 0.01 S/m to about 10 S/m. In some embodiments, the hydrogel has a conductivity from about 0.1 S/m to about 10 S/m. In some embodiments, the hydrogel has a conductivity from about 1.0 S/m to about 10 S/m. In some embodiments, the hydrogel has a conductivity from about 0.01 S/m to about 5 S/m. In some embodiments, the hydrogel has a conductivity from about 0.01 S/m to about 4 S/m. In some embodiments, the hydrogel has a conductivity from about 0.01 S/m to about 3 S/m. In some embodiments, the hydrogel has a conductivity from about 0.01 S/m to about 2 S/m. In some embodiments, the hydrogel has a conductivity from about 0.1 S/m to about 5 S/m. In some embodiments, the hydrogel has a conductivity from about 0.1 S/m to about 4 S/m. In some embodiments, the hydrogel has a conductivity from about 0.1 S/m to about 3 S/m. In some embodiments, the hydrogel has a conductivity from about 0.1 S/m to about 2 S/m. In some embodiments, the hydrogel has a conductivity from about 0.1 S/m to about 1.5 S/m. In some embodiments, the hydrogel has a conductivity from about 0.1 S/m to about 1.0 S/m.

[00100] In some embodiments, the hydrogel has a conductivity of about 0.1 S/m. In some embodiments, the hydrogel has a conductivity of about 0.2 S/m. In some embodiments, the hydrogel has a conductivity of about 0.3 S/m. In some embodiments, the hydrogel has a

conductivity of about 0.4 S/m. In some embodiments, the hydrogel has a conductivity of about 0.5 S/m. In some embodiments, the hydrogel has a conductivity of about 0.6 S/m. In some embodiments, the hydrogel has a conductivity of about 0.7 S/m. In some embodiments, the hydrogel has a conductivity of about 0.8 S/m. In some embodiments, the hydrogel has a conductivity of about 0.9 S/m. In some embodiments, the hydrogel has a conductivity of about 1.0 S/m.

[00101] In some embodiments, the hydrogel has a thickness from about 0.1 microns to about 10 microns. In some embodiments, the hydrogel has a thickness from about 0.1 microns to about 5 microns. In some embodiments, the hydrogel has a thickness from about 0.1 microns to about 4 microns. In some embodiments, the hydrogel has a thickness from about 0.1 microns to about 3 microns. In some embodiments, the hydrogel has a thickness from about 0.1 microns to about 2 microns. In some embodiments, the hydrogel has a thickness from about 1 micron to about 5 microns. In some embodiments, the hydrogel has a thickness from about 1 micron to about 4 microns. In some embodiments, the hydrogel has a thickness from about 1 micron to about 3 microns. In some embodiments, the hydrogel has a thickness from about 1 micron to about 2 microns. In some embodiments, the hydrogel has a thickness from about 0.5 microns to about 1 micron.

[00102] In some embodiments, the viscosity of a hydrogel solution prior to spin-coating ranges from about 0.5 cP to about 5 cP. In some embodiments, a single coating of hydrogel solution has a viscosity of between about 0.75 cP and 5 cP prior to spin-coating. In some embodiments, in a multi-coat hydrogel, the first hydrogel solution has a viscosity from about 0.5 cP to about 1.5 cP prior to spin coating. In some embodiments, the second hydrogel solution has a viscosity from about 1 cP to about 3 cP. The viscosity of the hydrogel solution is based on the polymers concentration (0.1% -10%) and polymers molecular weight (10,000 to 300,000) in the solvent and the starting viscosity of the solvent.

[00103] In some embodiments, the first hydrogel coating has a thickness between about 0.5 microns and 1 micron. In some embodiments, the first hydrogel coating has a thickness between about 0.5 microns and 0.75 microns. In some embodioments, the first hydrogel coating has a thickness between about 0.75 and 1 micron. In some embodiments, the second hydrogel coating has a thickness between about 0.2 microns and 0.5 microns. In some embodiments, the second hydrogel coating has a thickness between about 0.2 and 0.4 microns. In some embodiments, the second hydrogel coating has a thickness between about 0.2 and 0.3 microns. In some embodiments, the second hydrogel coating has a thickness between about 0.3 and 0.4 microns.

[00104] In some embodiments, the hydrogel comprises any suitable synthetic polymer forming a hydrogel. In general, any sufficiently hydrophilic and polymerizable molecule may be utilized in the production of a synthetic polymer hydrogel for use as disclosed herein. Polymerizable moieties in the monomers may include alkenyl moieties including but not limited to substituted or unsubstituted α,β,unsaturated carbonyls wherein the double bond is directly attached to a carbon which is double bonded to an oxygen and single bonded to another oxygen, nitrogen, sulfur, halogen, or carbon; vinyl, wherein the double bond is singly bonded to an oxygen, nitrogen, halogen, phosphorus or sulfur; allyl, wherein the double bond is singly bonded to a carbon which is bonded to an oxygen, nitrogen, halogen, phosphorus or sulfur; homoallyl, wherein the double bond is singly bonded to a carbon which is singly bonded to another carbon which is then singly bonded to an oxygen, nitrogen, halogen, phosphorus or sulfur; alkynyl moieties wherein a triple bond exists between two carbon atoms. In some embodiments, acryloyl or acrylamido monomers such as acrylates, methacrylates, acrylamides, methacrylamides, etc., are useful for formation of hydrogels as disclosed herein. More preferred acrylamido monomers include acrylamides, N-substituted acrylamides, N-substituted methacrylamides, and methacrylamide. In some embodiments, a hydrogel comprises polymers such as epoxide-based polymers, vinyl-based polymers, allyl-based polymers, homoallyl-based polymers, cyclic anhydride-based polymers, ester-based polymers, ether-based polymers, alkylene-glycol based polymers (*e.g.*, polypropylene glycol), and the like.

[00105] In some embodiments, the hydrogel comprises polyhydroxyethylmethacrylate (pHEMA), cellulose acetate, cellulose acetate phthalate, cellulose acetate butyrate, or any appropriate acrylamide or vinyl-based polymer, or a derivative thereof.

[00106] In some embodiments, the hydrogel is applied by vapor deposition.

[00107] In some embodiments, the hydrogel is polymerized via atom-transfer radical-polymerization via (ATRP).

[00108] In some embodiments, the hydrogel is polymerized via reversible addition–fragmentation chain-transfer (RAFT) polymerization.

[00109] In some embodiments, additives are added to a hydrogel to increase conductivity of the gel. In some embodiments, hydrogel additives are conductive polymers (*e.g.*, PEDOT: PSS), salts (*e.g.*, copper chloride), metals (*e.g.*, gold), plasticizers (*e.g.*, PEG200, PEG 400, or PEG 600), or co-solvents.

[00110] In some embodiments, the hydrogel also comprises compounds or materials which help maintain the stability of the DNA hybrids, including, but not limited to histidine, histidine peptides, polyhistidine, lysine, lysine peptides, and other cationic compounds or substances.

Dielectrophoretic Fields

[00111] In some embodiments, the methods, devices and systems described herein provide a mechanism to collect, separate, and/or isolate cells, particles, and/or molecules (such as exosomes, DNA, RNA, nucleosomes, extracellular vesicles, proteins, cell membrane fragments, mitochondria and cellular vesicles) from a fluid material (which optionally contains other materials, such as contaminants, residual cellular material, or the like).

[00112] In some embodiments, an AC electrokinetic field is generated to collect, separate or isolate biomolecules, such as exosomes, DNA, RNA, nucleosomes, extracellular vesicles, proteins, cell membrane fragments, mitochondria and cellular vesicles. In some embodiments, the AC electrokinetic field is a dielectrophoretic field. Accordingly, in some embodiments dielectrophoresis (DEP) is utilized in various steps of the methods described herein.

[00113] In some embodiments, the devices and systems described herein are capable of generating DEP fields, and the like. In specific embodiments, DEP is used to concentrate cells and/or nucleic acids (*e.g.*, concurrently or at different times). In certain embodiments, methods described herein further comprise energizing the array of electrodes so as to produce the first, second, and any further optional DEP fields. In some embodiments, the devices and systems described herein are capable of being energized so as to produce the first, second, and any further optional DEP fields.

[00114] DEP is a phenomenon in which a force is exerted on a dielectric particle when it is subjected to a non-uniform electric field. Depending on the step of the methods described herein, aspects of the devices and systems described herein, and the like, the dielectric particle in various embodiments herein is a biological cell and/or a molecule, such as a nucleic acid molecule. Different steps of the methods described herein or aspects of the devices or systems described herein may be utilized to isolate and separate different components, such as intact cells or other particular material; further, different field regions of the DEP field may be used in different steps of the methods or aspects of the devices and systems described herein. This dielectrophoretic force does not require the particle to be charged. In some instances, the strength of the force depends on the medium and the specific particles' electrical properties, on the particles' shape and size, as well as on the frequency of the electric field. In some instances, fields of a particular frequency selectivity manipulate particles. In certain aspects described herein, these processes allow for the separation of cells and/or smaller particles (such as molecules, including nucleic acid molecules) from other components (*e.g.*, in a fluid medium) or each other.

[00115] In various embodiments provided herein, a method or device described herein comprises producing a plurality of DEP field regions. For example, a method or device comprises a first DEP field region and a second DEP field region with the array. In various embodiments provided herein, a device or system described herein is capable of producing a first DEP field region and a second

DEP field region with the array. In some instances, the first and second field regions are part of a single field (*e.g.*, the first and second regions are present at the same time, but are found at different locations within the device and/or upon the array). In some embodiments, the first and second field regions are different fields (*e.g.* the first region is created by energizing the electrodes at a first time, and the second region is created by energizing the electrodes a second time). In specific aspects, the first DEP field region is suitable for concentrating or isolating cells (*e.g.*, into a low field DEP region). In some embodiments, the second DEP field region is suitable for concentrating smaller particles, such as molecules (*e.g.*, nucleic acid, including cell-free nucleic acid), for example into a high field DEP region. In some instances, a method described herein optionally excludes use of either the first or second DEP field region.

[00116] As is described below, in some instances, the first DEP field is suitable for concentrating or isolating nucleic acids, including cell-free nucleic acids, above a size, below a size, or within a range of sizes. In some instances, the second DEP field is suitable for concentrating or isolating nucleic acids, including cell-free nucleic acids, above a size, below a size, or within a range of sizes. The first and second DEP fields can be configured to concentrate or isolate the same or different size nucleic acids. As such, the methods and devices disclosed herein can be used to assess nucleic acids of a variety of different sizes.

[00117] Also described herein are embodiments comprising three or more DEP field regions, wherein each of the field regions can be configured to operate in the same or different many as at least one other field regions. Thus, the embodiments can concentrate or isolate a variety of materials in the biological samples based upon a variety of properties. For example, a first DEP field region can be configured to isolate cells, a second DEP field region can be configured to isolate or concentrate cell-free DNA above 500 bp, a third DEP field region can be configured to isolate or concentrate cell-free DNA between 300 bp and 500 bp, and a fourth DEP field region can be configured to isolate or concentrate cell-free DNA below 300 bp. Some of such embodiments can include quantitating the amount of DNA isolated or concentrated within each field region.

[00118] In some embodiments, the first DEP field region is in the same chamber of a device as disclosed herein as the second DEP field region. In some embodiments, the first DEP field region and the second DEP field region occupy the same area of the array of electrodes.

[00119] In some embodiments, the first DEP field region is in a separate chamber of a device as disclosed herein, or a separate device entirely, from the second DEP field region.

First DEP Field Region

[00120] In some aspects, *e.g.*, high conductance buffers (>100 mS/m), the method described herein comprises applying a fluid comprising cells or other particulate material to a device

comprising an array of electrodes, and, thereby, concentrating the cells in a first DEP field region. In some aspects, the devices and systems described herein are capable of applying a fluid comprising cells or other particulate material to the device comprising an array of electrodes, and, thereby, concentrating the cells in a first DEP field region. Subsequent or concurrent second, or optional third and fourth DEP regions, may collect or isolate other fluid components, including biomolecules, such as nucleic acids.

[00121] The first DEP field region may be any field region suitable for concentrating cells from a fluid. For this application, the cells are generally concentrated near the array of electrodes. In some embodiments, the first DEP field region is a dielectrophoretic low field region. In some embodiments, the first DEP field region is a dielectrophoretic high field region. In some aspects, *e.g.* low conductance buffers (<100 mS/m), the method described herein comprises applying a fluid comprising cells to a device comprising an array of electrodes, and, thereby, concentrating the cells or other particulate material in a first DEP field region.

[00122] In some aspects, the devices and systems described herein are capable of applying a fluid comprising cells or other particulate material to the device comprising an array of electrodes, and concentrating the cells in a first DEP field region. In various embodiments, the first DEP field region may be any field region suitable for concentrating cells from a fluid. In some embodiments, the cells are concentrated on the array of electrodes. In some embodiments, the cells are captured in a dielectrophoretic high field region. In some embodiments, the cells are captured in a dielectrophoretic low-field region. High versus low field capture is generally dependent on the conductivity of the fluid, wherein generally, the crossover point is between about 300-500 mS/m. In some embodiments, the first DEP field region is a dielectrophoretic low field region performed in fluid conductivity of greater than about 300 mS/m. In some embodiments, the first DEP field region is a dielectrophoretic low field region performed in fluid conductivity of less than about 300 mS/m. In some embodiments, the first DEP field region is a dielectrophoretic high field region performed in fluid conductivity of greater than about 300 mS/m. In some embodiments, the first DEP field region is a dielectrophoretic high field region performed in fluid conductivity of less than about 300 mS/m. In some embodiments, the first DEP field region is a dielectrophoretic low field region performed in fluid conductivity of greater than about 500 mS/m. In some embodiments, the first DEP field region is a dielectrophoretic low field region performed in fluid conductivity of less than about 500 mS/m. In some embodiments, the first DEP field region is a dielectrophoretic high field region performed in fluid conductivity of greater than about 500 mS/m. In some embodiments, the first DEP field region is a dielectrophoretic high field region performed in fluid conductivity of less than about 500 mS/m..

[00123] In some embodiments, the first dielectrophoretic field region is produced by an alternating current. The alternating current has any amperage, voltage, frequency, and the like suitable for concentrating cells. In some embodiments, the first dielectrophoretic field region is produced using an alternating current having an amperage of 0.1 micro Amperes – 10 Amperes; a voltage of 1-50 Volts peak to peak; and/or a frequency of 1 – 10,000,000 Hz. In some embodiments, the first DEP field region is produced using an alternating current having a voltage of 5-25 volts peak to peak. In some embodiments, the first DEP field region is produced using an alternating current having a frequency of from 3-15 kHz. In some embodiments, the first DEP field region is produced using an alternating current having an amperage of 1 milliamp to 1 amp. In some embodiments, the first DEP field region is produced using an alternating current having an amperage of 0.1 micro Amperes – 1 Ampere. In some embodiments, the first DEP field region is produced using an alternating current having an amperage of 1 micro Amperes – 1 Ampere. In some embodiments, the first DEP field region is produced using an alternating current having an amperage of 100 micro Amperes – 1 Ampere. In some embodiments, the first DEP field region is produced using an alternating current having an amperage of 500 micro Amperes – 500 milli Amperes. In some embodiments, the first DEP field region is produced using an alternating current having a voltage of 1-25 Volts peak to peak. In some embodiments, the first DEP field region is produced using an alternating current having a voltage of 1-10 Volts peak to peak. In some embodiments, the first DEP field region is produced using an alternating current having a voltage of 25-50 Volts peak to peak. In some embodiments, the first DEP field region is produced using a frequency of from 10-1,000,000 Hz. In some embodiments, the first DEP field region is produced using a frequency of from 100-100,000 Hz. In some embodiments, the first DEP field region is produced using a frequency of from 100-10,000 Hz. In some embodiments, the first DEP field region is produced using a frequency of from 10,000-100,000 Hz. In some embodiments, the first DEP field region is produced using a frequency of from 100,000-1,000,000 Hz.

[00124] In some embodiments, the first dielectrophoretic field region is produced by a direct current. The direct current has any amperage, voltage, frequency, and the like suitable for concentrating cells. In some embodiments, the first dielectrophoretic field region is produced using a direct current having an amperage of 0.1micro Amperes – 1 Amperes; a voltage of 10 milli Volts - 10 Volts; and/or a pulse width of 1 milliseconds – 1000 seconds and a pulse frequency of 0.001 – 1000 Hz. In some embodiments, the first DEP field region is produced using a direct current having an amperage of 1 micro Amperes -1 Amperes. In some embodiments, the first DEP field region is produced using a direct current having an amperage of 100 micro Amperes -500 milli Amperes. In some embodiments, the first DEP field region is produced using a direct current

having an amperage of 1 milli Amperes - 1 Amperes. In some embodiments, the first DEP field region is produced using a direct current having an amperage of 1 micro Amperes - 1 milli Amperes. In some embodiments, the first DEP field region is produced using a direct current having a pulse width of 500 milliseconds-500 seconds. In some embodiments, the first DEP field region is produced using a direct current having a pulse width of 500 milliseconds-100 seconds. In some embodiments, the first DEP field region is produced using a direct current having a pulse width of 1 second – 1000 seconds. In some embodiments, the first DEP field region is produced using a direct current having a pulse width of 500 milliseconds-1 second. In some embodiments, the first DEP field region is produced using a pulse frequency of 0.01-1000 Hz. In some embodiments, the first DEP field region is produced using a pulse frequency of 0.1-100 Hz. In some embodiments, the first DEP field region is produced using a pulse frequency of 1-100 Hz. In some embodiments, the first DEP field region is produced using a pulse frequency of 100-1000 Hz.

[00125] In some embodiments, the fluid comprises a mixture of cell types. For example, blood comprises red blood cells and white blood cells. Environmental samples comprise many types of cells and other particulate material over a wide range of concentrations. In some embodiments, one cell type (or any number of cell types less than the total number of cell types comprising the sample) is preferentially concentrated in the first DEP field. Without limitation, this embodiment is beneficial for focusing the nucleic acid isolation procedure on a particular environmental contaminant, such as a fecal coliform bacterium, whereby DNA sequencing may be used to identify the source of the contaminant. In another non-limiting example, the first DEP field is operated in a manner that specifically concentrates viruses and not cells (*e.g.*, in a fluid with conductivity of greater than 300 mS/m, viruses concentrate in a DEP high field region, while larger cells will concentrate in a DEP low field region).

[00126] In some embodiments, a method, device or system described herein is suitable for isolating or separating specific cell types. In some embodiments, the DEP field of the method, device or system is specifically tuned to allow for the separation or concentration of a specific type of cell into a field region of the DEP field. In some embodiments, a method, device or system described herein provides more than one field region wherein more than one type of cell is isolated or concentrated. In some embodiments, a method, device, or system described herein is tunable so as to allow isolation or concentration of different types of cells within the DEP field regions thereof. In some embodiments, a method provided herein further comprises tuning the DEP field. In some embodiments, a device or system provided herein is capable of having the DEP field tuned. In some instances, such tuning may be in providing a DEP particularly suited for the desired purpose. For example, modifications in the array, the energy, or another parameter are optionally

utilized to tune the DEP field. Tuning parameters for finer resolution include electrode diameter, edge to edge distance between electrodes, voltage, frequency, fluid conductivity and hydrogel composition.

[00127] In some embodiments, the first DEP field region comprises the entirety of an array of electrodes. In some embodiments, the first DEP field region comprises a portion of an array of electrodes. In some embodiments, the first DEP field region comprises about 90%, about 80%, about 70%, about 60%, about 50%, about 40%, about 30%, about 25%, about 20%, or about 10% of an array of electrodes. In some embodiments, the first DEP field region comprises about a third of an array of electrodes.

Second DEP Field Region

[00128] The second DEP field region can be configured to be the same or different than the first DEP field region. As described above, the second DEP field region can be configured to isolate or concentrate the same or different macromolecules and cellular components as the first DEP field region. These include macromolecules and cellular components include exosomes, DNA, RNA, nucleosomes, extracellular vesicles, proteins, cell membrane fragments, mitochondria and cellular vesicles.

[00129] In some aspects, the first DEP field region and second DEP field region can be configured to isolate or concentrate different subsets of the same type of macromolecule or cellular component. For example, in some embodiments, the first DEP field region can be configured to isolate or concentrate a first macromolecule or first cellular component of a first size or first range of sizes and the second DEP field region can be configured to isolate or concentrate the first macromolecule or first cellular component of a second size or second range of sizes. In one example, the first DEP field region can be configured to isolate or concentrate cell-free DNA between 300-500 bp and the second DEP field region can be configured to isolate or concentrate cell-free DNA smaller than 300 bp. Thus, the plurality of field regions can be used to discriminate between subsets of the same type of macromolecule or cellular components. In an exemplary advantage, use of a plurality of field regions can also allow for the quantification of one or more subsets of the same type of macromolecule or cellular component.

[00130] In one aspect, following lysis of the cells (as provided below), the methods described herein involve concentrating the nucleic acid in a second DEP field region. In another aspect, the devices and systems described herein are capable of concentrating the nucleic acid in a second DEP field region. In some embodiments, the second DEP field region is any field region suitable for concentrating nucleic acids. In some embodiments, the nucleic acids are concentrated on the array

of electrodes. In some embodiments, the second DEP field region is a dielectrophoretic high field region. The second DEP field region is, optionally, the same as the first DEP field region.

[00131] In some embodiments, the second dielectrophoretic field region is produced by an alternating current. In some embodiments, the alternating current has any amperage, voltage, frequency, and the like suitable for concentrating nucleic acids. In some embodiments, the second dielectrophoretic field region is produced using an alternating current having an amperage of 0.1 micro Amperes – 10 Amperes; a voltage of 1-50 Volts peak to peak; and/or a frequency of 1 – 10,000,000 Hz. In some embodiments, the second DEP field region is produced using an alternating current having an amperage of 0.1 micro Amperes – 1 Ampere. In some embodiments, the second DEP field region is produced using an alternating current having an amperage of 1 micro Amperes – 1 Ampere. In some embodiments, the second DEP field region is produced using an alternating current having an amperage of 100 micro Amperes – 1 Ampere. In some embodiments, the second DEP field region is produced using an alternating current having an amperage of 500 micro Amperes – 500 milli Amperes. In some embodiments, the second DEP field region is produced using an alternating current having a voltage of 1-25 Volts peak to peak. In some embodiments, the second DEP field region is produced using an alternating current having a voltage of 1-10 Volts peak to peak. In some embodiments, the second DEP field region is produced using an alternating current having a voltage of 25-50 Volts peak to peak. In some embodiments, the second DEP field region is produced using a frequency of from 10-1,000,000 Hz. In some embodiments, the second DEP field region is produced using a frequency of from 100-100,000 Hz. In some embodiments, the second DEP field region is produced using a frequency of from 100-10,000 Hz. In some embodiments, the second DEP field region is produced using a frequency of from 10,000-100,000 Hz. In some embodiments, the second DEP field region is produced using a frequency of from 100,000-1,000,000 Hz.

[00132] In some embodiments, the second dielectrophoretic field region is produced by a direct current. In some embodiments, the direct current has any amperage, voltage, frequency, and the like suitable for concentrating nucleic acids. In some embodiments, the second dielectrophoretic field region is produced using a direct current having an amperage of 0.1micro Amperes – 1 Amperes; a voltage of 10 milli Volts - 10 Volts; and/or a pulse width of 1 milliseconds – 1000 seconds and a pulse frequency of 0.001 – 1000 Hz. . In some embodiments, the second DEP field region is produced using an alternating current having a voltage of 5-25 volts peak to peak. In some embodiments, the second DEP field region is produced using an alternating current having a frequency of from 3-15 kHz. In some embodiments, the second DEP field region is produced using an alternating current having an amperage of 1 milliamp to 1 amp. In some embodiments, the

second DEP field region is produced using a direct current having an amperage of 1 micro Amperes -1 Amperes. In some embodiments, the second DEP field region is produced using a direct current having an amperage of 100 micro Amperes -500 milli Amperes. In some embodiments, the second DEP field region is produced using a direct current having an amperage of 1 milli Amperes - 1 Amperes. In some embodiments, the second DEP field region is produced using a direct current having an amperage of 1 micro Amperes - 1 milli Amperes. In some embodiments, the second DEP field region is produced using a direct current having a pulse width of 500 milliseconds-500 seconds. In some embodiments, the second DEP field region is produced using a direct current having a pulse width of 500 milliseconds-100 seconds. In some embodiments, the second DEP field region is produced using a direct current having a pulse width of 1 second – 1000 seconds. In some embodiments, the second DEP field region is produced using a direct current having a pulse width of 500 milliseconds-1 second. In some embodiments, the second DEP field region is produced using a pulse frequency of 0.01-1000 Hz. In some embodiments, the second DEP field region is produced using a pulse frequency of 0.1-100 Hz. In some embodiments, the second DEP field region is produced using a pulse frequency of 1-100 Hz. In some embodiments, the second DEP field region is produced using a pulse frequency of 100-1000 Hz.

[00133] In some embodiments, the second DEP field region comprises the entirety of an array of electrodes. In some embodiments, the second DEP field region comprises a portion of an array of electrodes. In some embodiments, the second DEP field region comprises about 90%, about 80%, about 70%, about 60%, about 50%, about 40%, about 30%, about 25%, about 20%, or about 10% of an array of electrodes. In some embodiments, the second DEP field region comprises about a third of an array of electrodes.

Isolating Biomarkers

[00134] In some aspects, described herein are methods, devices and systems for isolating a biomarker from a biological complex, for example vesicles such as extracellular vesicles, exosomes, microvesicles, enveloped-particles, and other complex particles or biological parcels that include a combination of biological components, including DNA, RNA, proteins, lipids and other biological molecules.

[00135] In one aspect, described herein is a method for isolating a biomarker from an exosome (*e.g.*, DNA, RNA, nucleosomes, proteins, and/or cell membrane fragments) from a fluid. In some embodiments, the biomarkers are cell-free nucleic acids. In some embodiments, the method comprises: applying a fluid to a device, the device comprising an array of electrodes; concentrating a plurality of exosomes in a first AC electrokinetic (*e.g.*, dielectrophoretic) field region; and eluting the exosomes from the device for further analysis (*e.g.*, sequencing, mass spectroscopy, etc).

[00136] In some embodiments, disclosed herein is method for isolating a cell-free nucleic acid from a fluid, the method comprising: a. applying the fluid to a device, the device comprising an array of electrodes; b. concentrating a plurality of cellular materials in a first AC electrokinetic (*e.g.*, dielectrophoretic) field region; c. isolating nucleic acid in a second AC electrokinetic (*e.g.*, dielectrophoretic) field region; and d. flushing the cellular materials away. In some instances, residual cellular material is concentrated near the low field region. In some embodiments, the residual material is washed from the device and/or washed from the nucleic acids. In some embodiments, the nucleic acid is concentrated in the second AC electrokinetic field region.

[00137] In some embodiments, the biomarker nucleic acids are initially inside the cells. As seen in FIG. 3, the method comprises concentrating the cells near a high field region in some instances. In some embodiments, disclosed herein is method for isolating a nucleic acid from a fluid comprising cells, the method comprising: a. applying the fluid to a device, the device comprising an array of electrodes; b. concentrating a plurality of cells in a first AC electrokinetic (*e.g.*, dielectrophoretic) field region; c. isolating nucleic acid in a second AC electrokinetic (*e.g.*, dielectrophoretic) field region; and d. flushing cells away. In some instances, the cells are lysed in the high field region. Following lysis, the nucleic acids remain in the high field region and/or are concentrated in the high field region. In some instances, residual cellular material is concentrated near the low field region. In some embodiments, the residual material is washed from the device and/or washed from the nucleic acids. In some embodiments, the nucleic acid is concentrated in the second AC electrokinetic field region.

[00138] In one aspect, described herein is a method for isolating a biomarker from a fluid comprising cells or other particulate material. In some embodiments, the biomarkers are not inside the cells (*e.g.,* cell-free DNA in fluid). In some embodiments, disclosed herein is a method for isolating a biomarker from a fluid comprising cells or other particulate material, the method comprising: a. applying the fluid to a device, the device comprising an array of electrodes; b. concentrating a plurality of cells in a first AC electrokinetic (*e.g.*, dielectrophoretic) field region; c. isolating biomarkers (*e.g.*, exosomes, DNA, RNA, nucleosomes, extracellular vesicles, proteins, cell membrane fragments, mitochondria and cellular vesicles) in a second AC electrokinetic (*e.g.*, dielectrophoretic) field region; and d. flushing cells away. In some embodiments, the method further comprises degrading residual proteins after flushing cells away. FIG. 4 shows an exemplary method for isolating extra-cellular nucleic acids from a fluid comprising cells. A similar method is used to isolate other small particulates from cells, such as vesicles such as extracellular vesicles, exosomes, microvesicles, enveloped-particles, and other complex particles or biological parcels that include a combination of biological components, including DNA, RNA, proteins, lipids and

other biological molecules. In some embodiments, cells are concentrated on or near a low field region and nucleic acids (or other small particulates) are concentrated on or near a high field region. In some instances, the cells are washed from the device and/or washed from the nucleic acids (or other small particulates).

[00139] In one aspect, the methods, systems and devices described herein isolate nucleic acid from a fluid comprising cells or other particulate material. In one aspect, dielectrophoresis is used to concentrate cells. In some embodiments, the fluid is a liquid, optionally water or an aqueous solution or dispersion. In some embodiments, the fluid is any suitable fluid including a bodily fluid. Exemplary bodily fluids include blood, serum, plasma, bile, milk, cerebrospinal fluid, gastric juice, ejaculate, mucus, peritoneal fluid, saliva, sweat, tears, urine, and the like. In some embodiments, nucleic acids are isolated from bodily fluids using the methods, systems or devices described herein as part of a medical therapeutic or diagnostic procedure, device or system. In some embodiments, the fluid is tissues and/or cells solubilized and/or dispersed in a fluid. For example, the tissue can be a cancerous tumor from which nucleic acid can be isolated using the methods, devices or systems described herein.

[00140] In some embodiments, the fluid may also comprise other particulate material. Such particulate material may be, for example, inclusion bodies (*e.g.*, ceroids or Mallory bodies), cellular casts (*e.g.*, granular casts, hyaline casts, cellular casts, waxy casts and pseudo casts), Pick's bodies, Lewy bodies, fibrillary tangles, fibril formations, cellular debris and other particulate material. In some embodiments, particulate material is an aggregated protein (*e.g.*, beta-amyloid).

[00141] The fluid can have any conductivity including a high or low conductivity. In some embodiments, the conductivity is between about 1 μS/m to about 10 mS/m. In some embodiments, the conductivity is between about 10 μS/m to about 10 mS/m. In other embodiments, the conductivity is between about 50 μS/m to about 10 mS/m. In yet other embodiments, the conductivity is between about 100 μS/m to about 10 mS/m, between about 100 μS/m to about 8 mS/m, between about 100 μS/m to about 6 mS/m, between about 100 μS/m to about 5 mS/m, between about 100 μS/m to about 4 mS/m, between about 100 μS/m to about 3 mS/m, between about 100 μS/m to about 2 mS/m, or between about 100 μS/m to about 1 mS/m.

[00142] In some embodiments, the conductivity is about 1 μS/m. In some embodiments, the conductivity is about 10 μS/m. In some embodiments, the conductivity is about 100 μS/m. In some embodiments, the conductivity is about 1 mS/m. In other embodiments, the conductivity is about 2 mS/m. In some embodiments, the conductivity is about 3 mS/m. In yet other embodiments, the conductivity is about 4 mS/m. In some embodiments, the conductivity is about 5 mS/m. In some embodiments, the conductivity is about 10 mS/m. In still other embodiments, the conductivity is

about 100 mS/m. In some embodiments, the conductivity is about 1 S/m. In other embodiments, the conductivity is about 10 S/m.

[00143] In some embodiments, the conductivity is at least 1 μS/m. In yet other embodiments, the conductivity is at least 10 μS/m. In some embodiments, the conductivity is at least 100 μS/m. In some embodiments, the conductivity is at least 1 mS/m. In additional embodiments, the conductivity is at least 10 mS/m. In yet other embodiments, the conductivity is at least 100 mS/m. In some embodiments, the conductivity is at least 1 S/m. In some embodiments, the conductivity is at least 10 S/m. In some embodiments, the conductivity is at most 1 μS/m. In some embodiments, the conductivity is at most 10 μS/m. In other embodiments, the conductivity is at most 100 μS/m. In some embodiments, the conductivity is at most 1 mS/m. In some embodiments, the conductivity is at most 10 mS/m. In some embodiments, the conductivity is at most 100 mS/m. In yet other embodiments, the conductivity is at most 1 S/m. In some embodiments, the conductivity is at most 10 S/m.

[00144] In some embodiments, the fluid is a small volume of liquid including less than 10 ml. In some embodiments, the fluid is less than 8 ml. In some embodiments, the fluid is less than 5 ml. In some embodiments, the fluid is less than 2 ml. In some embodiments, the fluid is less than 1 ml. In some embodiments, the fluid is less than 500 μl. In some embodiments, the fluid is less than 200 μl. In some embodiments, the fluid is less than 100 μl. In some embodiments, the fluid is less than 50 μl. In some embodiments, the fluid is less than 10 μl. In some embodiments, the fluid is less than 5 μl. In some embodiments, the fluid is less than 1 μl.

[00145] In some embodiments, the quantity of fluid applied to the device or used in the method comprises less than about 100,000,000 cells. In some embodiments, the fluid comprises less than about 10,000,000 cells. In some embodiments, the fluid comprises less than about 1,000,000 cells. In some embodiments, the fluid comprises less than about 100,000 cells. In some embodiments, the fluid comprises less than about 10,000 cells. In some embodiments, the fluid comprises less than about 1,000 cells. In some embodiments, the fluid is cell-free.

[00146] In some embodiments, isolation of nucleic acid from a fluid comprising cells or other particulate material with the devices, systems and methods described herein takes less than about 30 minutes, less than about 20 minutes, less than about 15 minutes, less than about 10 minutes, less than about 5 minutes or less than about 1 minute. In other embodiments, isolation of nucleic acid from a fluid comprising cells or other particulate material with the devices, systems and methods described herein takes not more than 30 minutes, not more than about 20 minutes, not more than about 15 minutes, not more than about 10 minutes, not more than about 5 minutes, not more than about 2 minutes or not more than about 1 minute. In additional embodiments, isolation of nucleic

acid from a fluid comprising cells or other particulate material with the devices, systems and methods described herein takes less than about 15 minutes, preferably less than about 10 minutes or less than about 5 minutes.

[00147] In some instances, exosomes, extra-cellular DNA, cell-free DNA fragments, or other nucleic acids (outside cells) are isolated from a fluid comprising cells of other particulate material. In some embodiments, the fluid comprises cells. In some embodiments, the fluid does not comprise cells.

Cell Lysis

[00148] In one aspect, following concentrating the cells in a first dielectrophoretic field region, the method involves freeing nucleic acids from the cells. In another aspect, the devices and systems described herein are capable of freeing nucleic acids from the cells. In some embodiments, the nucleic acids are freed from the cells in the first DEP field region.

[00149] In some embodiments, the methods described herein free nucleic acids from a plurality of cells by lysing the cells. In some embodiments, the devices and systems described herein are capable of freeing nucleic acids from a plurality of cells by lysing the cells. One method of cell lysis involves applying a direct current to the cells after isolation of the cells on the array. The direct current has any suitable amperage, voltage, and the like suitable for lysing cells. In some embodiments, the current has a voltage of about 1 Volt to about 500 Volts. In some embodiments, the current has a voltage of about 10 Volts to about 500 Volts. In other embodiments, the current has a voltage of about 10 Volts to about 250 Volts. In still other embodiments, the current has a voltage of about 50 Volts to about 150 Volts. Voltage is generally the driver of cell lysis, as high electric fields result in failed membrane integrity.

[00150] In some embodiments, the direct current used for lysis comprises one or more pulses having any duration, frequency, and the like suitable for lysing cells. In some embodiments, a voltage of about 100 volts is applied for about 1 millisecond to lyse cells. In some embodiments, the voltage of about 100 volts is applied 2 or 3 times over the source of a second.

[00151] In some embodiments, the frequency of the direct current depends on volts/cm, pulse width, and the fluid conductivity. In some embodiments, the pulse has a frequency of about 0.001 to about 1000 Hz. In some embodiments, the pulse has a frequency from about 10 to about 200 Hz. In other embodiments, the pulse has a frequency of about .01 Hz – 1000 Hz. In still other embodiments, the pulse has a frequency of about 0.1 Hz – 1000 Hz, about 1 Hz – 1000 Hz, about 1 Hz – 500 Hz, about 1 Hz – 400 Hz, about 1 Hz – 300 Hz, or about 1 Hz – about 250 Hz. In some embodiments, the pulse has a frequency of about 0.1 Hz. In other embodiments, the pulse has a frequency of about 1 Hz. In still other embodiments, the pulse has a frequency of about 5 Hz,

about 10 Hz, about 50 Hz, about 100 Hz, about 200 Hz, about 300 Hz, about 400 Hz, about 500 Hz, about 600 Hz, about 700 Hz, about 800 Hz, about 900 Hz or about 1000 Hz.

[00152] In other embodiments, the pulse has a duration of about 1 millisecond (ms) – 1000 seconds (s). In some embodiments, the pulse has a duration of about 10 ms – 1000 s. In still other embodiments, the pulse has a duration of about 100 ms – 1000 s, about 1 s – 1000 s, about 1 s – 500 s, about 1 s – 250 s or about 1 s – 150 s. In some embodiments, the pulse has a duration of about 1 ms, about 10 ms, about 100 ms, about 1 s, about 2 s, about 3 s, about 4 s, about 5 s, about 6 s, about 7 s, about 8 s, about 9 s, about 10 s, about 20 s, about 50 s, about 100 s, about 200 s, about 300 s, about 500 s or about 1000s. In some embodiments, the pulse has a frequency of 0.2 to 200 Hz with duty cycles from 10-50%.

[00153] In some embodiments, the direct current is applied once, or as multiple pulses. Any suitable number of pulses may be applied including about 1-20 pulses. There is any suitable amount of time between pulses including about 1 millisecond – 1000 seconds. In some embodiments, the pulse duration is .01 to 10 seconds.

[00154] In some embodiments, the cells are lysed using other methods in combination with a direct current applied to the isolated cells. In yet other embodiments, the cells are lysed without use of direct current. In various aspects, the devices and systems are capable of lysing cells with direct current in combination with other means, or may be capable of lysing cells without the use of direct current. Any method of cell lysis known to those skilled in the art may be suitable including, but not limited to application of a chemical lysing agent (*e.g.*, an acid), an enzymatic lysing agent, heat, pressure, shear force, sonic energy, osmotic shock, or combinations thereof. Lysozyme is an example of an enzymatic-lysing agent.

Removal of Residual Material

[00155] In some embodiments, following concentration of the targeted cellular material in the second DEP field region, the method includes optionally flushing residual material from the targeted cellular material. In some embodiments, the devices or systems described herein are capable of optionally comprising a reservoir comprising a fluid suitable for flushing residual material from the targeted cellular material. In some embodiments, the targeted cellular material is held near the array of electrodes, such as in the second DEP field region, by continuing to energize the electrodes. "Residual material" is anything originally present in the fluid, originally present in the cells, added during the procedure, created through any step of the process including but not limited to lysis of the cells (*i.e.* residual cellular material), and the like. For example, residual material includes non-lysed cells, cell wall fragments, proteins, lipids, carbohydrates, minerals, salts, buffers, plasma, and undesired nucleic acids. In some embodiments, the lysed cellular

material comprises residual protein freed from the plurality of cells upon lysis. It is possible that not all of the targeted cellular material will be concentrated in the second DEP field. In some embodiments, a certain amount of targeted cellular material is flushed with the residual material.

[00156] In some embodiments, the residual material is flushed in any suitable fluid, for example in water, TBE buffer, or the like. In some embodiments, the residual material is flushed with any suitable volume of fluid, flushed for any suitable period of time, flushed with more than one fluid, or any other variation. In some embodiments, the method of flushing residual material is related to the desired level of isolation of the targeted cellular material with higher purity targeted cellular material requiring more stringent flushing and/or washing. In other embodiments, the method of flushing residual material is related to the particular starting material and its composition. In some instances, a starting material that is high in lipid requires a flushing procedure that involves a hydrophobic fluid suitable for solubilizing lipids.

[00157] In some embodiments, the method includes degrading residual material including residual protein. In some embodiments, the devices or systems are capable of degrading residual material including residual protein. For example, proteins are degraded by one or more of chemical degradation (*e.g.* acid hydrolysis) and enzymatic degradation. In some embodiments, the enzymatic degradation agent is a protease. In other embodiments, the protein degradation agent is Proteinase K. The optional step of degradation of residual material is performed for any suitable time, temperature, and the like. In some embodiments, the degraded residual material (including degraded proteins) is flushed from the nucleic acid.

[00158] In some embodiments, the agent used to degrade the residual material is inactivated or degraded. In some embodiments, the devices or systems are capable of degrading or inactivating the agent used to degrade the residual material. In some embodiments, an enzyme used to degrade the residual material is inactivated by heat (*e.g.*, 50 to 95° C for 5-15 minutes). For example, enzymes including proteases, (for example, Proteinase K) are degraded and/or inactivated using heat (typically, 15 minutes, 70 °C). In some embodiments wherein the residual proteins are degraded by an enzyme, the method further comprises inactivating the degrading enzyme (*e.g.*, Proteinase K) following degradation of the proteins. In some embodiments, heat is provided by a heating module in the device (temperature range, *e.g.*, from 30 to 95 °C).

[00159] The order and/or combination of certain steps of the method can be varied. In some embodiments, the devices or methods are capable of performing certain steps in any order or combination. For example, in some embodiments, the residual material and the degraded proteins are flushed in separate or concurrent steps. That is, the residual material is flushed, followed by degradation of residual proteins, followed by flushing degraded proteins from the nucleic acid. In

some embodiments, one first degrades the residual proteins, and then flush both the residual material and degraded proteins from the nucleic acid in a combined step.

[00160] In some embodiments, the targeted cellular materials are retained in the device and optionally used in further procedures such as PCR or other procedures manipulating or amplifying nucleic acid. In some embodiments, the devices and systems are capable of performing PCR or other optional procedures. In other embodiments, the targeted cellular materials are collected and/or eluted from the device. In some embodiments, the devices and systems are capable of allowing collection and/or elution of targeted cellular material from the device or system. In some embodiments, the isolated cellular material is collected by (i) turning off the second dielectrophoretic field region; and (ii) eluting the material from the array in an eluant. Exemplary eluants include water, TE, TBE and L-Histidine buffer.

Biological Molecules

[00161] In some embodiments, the method, device, or system described herein is optionally utilized to obtain, isolate, or separate any desired biological material that may be obtained from such a method, device or system, such as extracellular vesicles, exosomes, microvesicles, enveloped-particles, and other complex particles or biological parcels that include a combination of biological components, including DNA, RNA, proteins, lipids and other biological molecules. Nucleic acids isolated by the methods, devices and systems described herein include DNA (deoxyribonucleic acid), RNA (ribonucleic acid), and combinations thereof. DNA can include cell-free DNA and DNA fragments. In some embodiments, the nucleic acid is isolated in a form suitable for sequencing or further manipulation of the nucleic acid, including amplification, ligation or cloning. Proteins isolated by the methods devices and systems described herein include protein complexes, full length proteins, processed proteins, and protein fragments. In some embodiments, the protein is isolated in a form suitable for mass spectroscopy or antibody-based analysis (e.g., ELISA, Western blot, immunofluorescence).

[00162] In some embodiments, the isolated, separated, or captured nucleic acid comprises DNA fragments that are selectively or preferentially isolated, separated, or captured based on their sizes. In some embodiments, the DNA fragments that are selectively or preferentially isolated, separated, or captured are between 250-600 bp, 250-275 bp, 275-300 bp, 300-325 bp, 325-350 bp, 350-375 bp, 375-400 bp, 400-425 bp, 425-450 bp, 450-475 bp, 475-500 bp, 500-525 bp, 525-550 bp, 550-575 bp, 575-600 bp, 300-400 bp, 400-500 bp, and/or 300-500 bp in length. In some embodiments, the DNA fragments that are selectively or preferentially isolated, separated, or captured are between 600-700 bp, 700-800 bp, 800-900 bp, 900-1000 bp, 1-2 kbp, 2-3 kbp, 3-4 kbp, 4-5 kbp, 5-6 kbp, 6-7 kbp, 7-8 kbp, 8-9 kbp, or 9-10 kbp. In some embodiments, the DNA fragments that are

selectively or preferentially isolated, separated, or captured are greater than 300, 400, 500, 600, 700, 800, 900, or 1000 bp in size.

[00163] In some embodiments, the DNA fragments are cell-free DNA fragments.

[00164] In various embodiments, an isolated or separated nucleic acid is a composition comprising nucleic acid that is free from at least 99% by mass of other materials, free from at least 99% by mass of residual cellular material (*e.g.*, from lysed cells from which the nucleic acid is obtained), free from at least 98% by mass of other materials, free from at least 98% by mass of residual cellular material, free from at least 95% by mass of other materials, free from at least 95% by mass of residual cellular material, free from at least 90% by mass of other materials, free from at least 90% by mass of residual cellular material, free from at least 80% by mass of other materials, free from at least 80% by mass of residual cellular material, free from at least 70% by mass of other materials, free from at least 70% by mass of residual cellular material, free from at least 60% by mass of other materials, free from at least 60% by mass of residual cellular material, free from at least 50% by mass of other materials, free from at least 50% by mass of residual cellular material, free from at least 30% by mass of other materials, free from at least 30% by mass of residual cellular material, free from at least 10% by mass of other materials, free from at least 10% by mass of residual cellular material, free from at least 5% by mass of other materials, or free from at least 5% by mass of residual cellular material.

[00165] In various embodiments, the nucleic acid has any suitable purity. For example, if a DNA sequencing procedure can work with nucleic acid samples having about 20% residual cellular material, then isolation of the nucleic acid to 80% is suitable. In some embodiments, the isolated nucleic acid comprises less than about 80%, less than about 70%, less than about 60%, less than about 50%, less than about 40%, less than about 30%, less than about 20%, less than about 10%, less than about 5%, or less than about 2% non-nucleic acid cellular material and/or protein by mass. In some embodiments, the isolated nucleic acid comprises greater than about 99%, greater than about 98%, greater than about 95%, greater than about 90%, greater than about 80%, greater than about 70%, greater than about 60%, greater than about 50%, greater than about 40%, greater than about 30%, greater than about 20%, or greater than about 10% nucleic acid by mass.

[00166] The nucleic acids are isolated in any suitable form including unmodified, derivatized, fragmented, non-fragmented, and the like. In some embodiments, the nucleic acid is collected in a form suitable for sequencing. In some embodiments, the nucleic acid is collected in a fragmented form suitable for shotgun-sequencing, amplification or other manipulation. The nucleic acid may be collected from the device in a solution comprising reagents used in, for example, a DNA sequencing procedure, such as nucleotides as used in sequencing by synthesis methods.

[00167] In some embodiments, the methods described herein result in an isolated nucleic acid sample that is approximately representative of the nucleic acid of the starting sample. In some embodiments, the devices and systems described herein are capable of isolating nucleic acid from a sample that is approximately representative of the nucleic acid of the starting sample. That is, the population of nucleic acids collected by the method, or capable of being collected by the device or system, are substantially in proportion to the population of nucleic acids present in the cells in the fluid. In some embodiments, this aspect is advantageous in applications in which the fluid is a complex mixture of many cell types and the practitioner desires a nucleic acid-based procedure for determining the relative populations of the various cell types.

[00168] In some embodiments, the nucleic acid isolated using the methods described herein or capable of being isolated by the devices described herein is high-quality and/or suitable for using directly in downstream procedures such as DNA sequencing, nucleic acid amplification, such as PCR, or other nucleic acid manipulation, such as ligation, cloning or further translation or transformation assays. In some embodiments, the collected nucleic acid comprises at most 0.01 % protein. In some embodiments, the collected nucleic acid comprises at most 0.5% protein. In some embodiments, the collected nucleic acid comprises at most 0.1 % protein. In some embodiments, the collected nucleic acid comprises at most 1 % protein. In some embodiments, the collected nucleic acid comprises at most 2% protein. In some embodiments, the collected nucleic acid comprises at most 3% protein. In some embodiments, the collected nucleic acid comprises at most 4% protein. In some embodiments, the collected nucleic acid comprises at most 5% protein.

[00169] In some embodiments, the nucleic acid isolated by the methods described herein or capable of being isolated by the devices described herein has a concentration of at least 0.5 ng/mL. In some embodiments, the nucleic acid isolated by the methods described herein or capable of being isolated by the devices described herein has a concentration of at least 1 ng/mL. In some embodiments, the nucleic acid isolated by the methods described herein or capable of being isolated by the devices described herein has a concentration of at least 5 ng/mL. In some embodiments, the nucleic acid isolated by the methods described herein or capable of being isolated by the devices described herein has a concentration of at least 10 ng/ml.

[00170] In some embodiments, about 50 pico-grams of nucleic acid is isolated from about 5,000 cells using the methods, systems or devices described herein. In some embodiments, the methods, systems or devices described herein yield at least 10 pico-grams of nucleic acid from about 5,000 cells. In some embodiments, the methods, systems or devices described herein yield at least 20 pico-grams of nucleic acid from about 5,000 cells. In some embodiments, the methods, systems or devices described herein yield at least 50 pico-grams of nucleic acid from about 5,000 cells. In

some embodiments, the methods, systems or devices described herein yield at least 75 pico-grams of nucleic acid from about 5,000 cells. In some embodiments, the methods, systems or devices described herein yield at least 100 pico-grams of nucleic acid from about 5,000 cells. In some embodiments, the methods, systems or devices described herein yield at least 200 pico-grams of nucleic acid from about 5,000 cells. In some embodiments, the methods, systems or devices described herein yield at least 300 pico-grams of nucleic acid from about 5,000 cells. In some embodiments, the methods, systems or devices described herein yield at least 400 pico-grams of nucleic acid from about 5,000 cells. In some embodiments, the methods, systems or devices described herein yield at least 500 pico-grams of nucleic acid from about 5,000 cells. In some embodiments, the methods, systems or devices described herein yield at least 1,000 pico-grams of nucleic acid from about 5,000 cells. In some embodiments, the methods, systems or devices described herein yield at least 10,000 pico-grams of nucleic acid from about 5,000 cells.

Assays and Applications

[00171] In some embodiments, the methods described herein further comprise optionally amplifying the isolated nucleic acid by polymerase chain reaction (PCR). In some embodiments, the PCR reaction is performed on or near the array of electrodes or in the device. In some embodiments, the device or system comprise a heater and/or temperature control mechanisms suitable for thermocycling.

[00172] PCR is optionally done using traditional thermocycling by placing the reaction chemistry analytes in between two efficient thermoconductive elements (*e.g.*, aluminum or silver) and regulating the reaction temperatures using TECs. Additional designs optionally use infrared heating through optically transparent material like glass or thermo polymers. In some instances, designs use smart polymers or smart glass that comprise conductive wiring networked through the substrate. This conductive wiring enables rapid thermal conductivity of the materials and (by applying appropriate DC voltage) provides the required temperature changes and gradients to sustain efficient PCR reactions. In certain instances, heating is applied using resistive chip heaters and other resistive elements that will change temperature rapidly and proportionally to the amount of current passing through them.

[00173] In some embodiments, used in conjunction with traditional fluorometry (ccd, pmt, other optical detector, and optical filters), fold amplification is monitored in real-time or on a timed interval. In certain instances, quantification of final fold amplification is reported via optical detection converted to AFU (arbitrary fluorescence units correlated to analyze doubling) or translated to electrical signal via impedance measurement or other electrochemical sensing.

[00174] Given the small size of the micro electrode array, these elements are optionally added around the micro electrode array and the PCR reaction will be performed in the main sample processing chamber (over the DEP array) or the analytes to be amplified are optionally transported via fluidics to another chamber within the fluidic cartridge to enable on-cartridge **Lab-On-Chip Processing**

[00175] In some instances, light delivery schemes are utilized to provide the optical excitation and/or emission and/or detection of fold amplification. In certain embodiments, this includes using the flow cell materials (thermal polymers like acrylic (PMMA) cyclic olefin polymer (COP), cyclic olefin co-polymer, (COC), etc.) as optical wave guides to remove the need to use external components. In addition, in some instances light sources - light emitting diodes - LEDs, vertical-cavity surface-emitting lasers - VCSELs, and other lighting schemes are integrated directly inside the flow cell or built directly onto the micro electrode array surface to have internally controlled and powered light sources. Miniature PMTs, CCDs, or CMOS detectors can also be built into the flow cell. This minimization and miniaturization enables compact devices capable of rapid signal delivery and detection while reducing the footprint of similar traditional devices (i.e. a standard bench top PCR/QPCR/Fluorometer).

Amplification on Chip

[00176] In some instances, silicon microelectrode arrays can withstand thermal cycling necessary for PCR. In some applications, on-chip PCR is advantageous because small amounts of target nucleic acids can be lost during transfer steps. In certain embodiments of devices, systems or processes described herein, any one or more of multiple PCR techniques are optionally used, such techniques optionally including any one or more of the following: thermal cycling in the flow cell directly; moving the material through microchannels with different temperature zones; and moving volume into a PCR tube that can be amplified on system or transferred to a PCR machine. In some instances, droplet PCR is performed if the outlet contains a T-junction that contains an immiscible fluid and interfacial stabilizers (surfactants, etc.). In certain embodiments, droplets are thermal cycled in by any suitable method.

[00177] In some embodiments, amplification is performed using an isothermal reaction, for example, transcription mediated amplification, nucleic acid sequence-based amplification, signal mediated amplification of RNA technology, strand displacement amplification, rolling circle amplification, loop-mediated isothermal amplification of DNA, isothermal multiple displacement amplification, helicase-dependent amplification, single primer isothermal amplification or circular helicase-dependent amplification.

[00178] In various embodiments, amplification is performed in homogenous solution or as heterogeneous system with anchored primer(s). In some embodiments of the latter, the resulting amplicons are directly linked to the surface for higher degree of multiplex. In some embodiments, the amplicon is denatured to render single stranded products on or near the electrodes. Hybridization reactions are then optionally performed to interrogate the genetic information, such as single nucleotide polymorphisms (SNPs), Short Tandem Repeats (STRs), mutations, insertions/deletions, methylation, etc. Methylation is optionally determined by parallel analysis where one DNA sample is bisulfite treated and one is not. Bisulfite depurinates unmodified C becoming a U. Methylated C is unaffected in some instances. In some embodiments, allele specific base extension is used to report the base of interest.

[00179] Rather than specific interactions, the surface is optionally modified with nonspecific moieties for capture. For example, surface could be modified with polycations, i.e., polylysine, to capture DNA molecules which can be released by reverse bias (-V). In some embodiments, modifications to the surface are uniform over the surface or patterned specifically for functionalizing the electrodes or non electrode regions. In certain embodiments, this is accomplished with photolithography, electrochemical activation, spotting, and the like.

[00180] In some applications, a chip may include multiple regions, each region configured to capture DNA fragments of a specific or different size. Chip regions can sometimes vary with respect to voltage, amperage, frequency, pitch, electrode diameter, the depth of the well, or other factors to selectively capture fragments of different sizes in different regions. In some embodiments, each region comprises an array of multiple electrodes.

[00181] In various embodiments, devices or regions are run sequentially or in parallel. In some embodiments, multiple chip designs are used to narrow the size range of material collected creating a band pass filter. In some instances, current chip geometry (*e.g.,* 80 um diameter electrodes on 200 um center-center pitch (80/200) acts as 500 bp cutoff filter (*e.g.,* using voltage and frequency conditions around 10 Vpp and 10 kHz). In such instances, a nucleic acid of greater than 500 bp is captured, and a nucleic acid of less than 500 bp is not. Alternate electrode diameter and pitch geometries have different cutoff sizes such that a combination of chips should provide a desired fragment size. In some instances, a 40 um diameter electrode on 100 um center-center pitch (40/100) has a lower cutoff threshold, whereas a 160 um diameter electrode on 400 um center-center pitch (160/400) has a higher cutoff threshold relative to the 80/200 geometry, under similar conditions. In various embodiments, geometries on a single chip or multiple chips are combined to select for a specific sized fragments or particles. For example a 600 bp cutoff chip would leave a nucleic acid of less than 600 bp in solution, then that material is optionally recaptured with a 500

bp cutoff chip (which is opposing the 600 bp chip). This leaves a nucleic acid population comprising 500-600 bp in solution. This population is then optionally amplified in the same chamber, a side chamber, or any other configuration. In some embodiments, size selection is accomplished using a single electrode geometry, wherein nucleic acid of >500 bp is isolated on the electrodes, followed by washing, followed by reduction of the ACEK high field strength (change voltage, frequency, conductivity)in order to release nucleic acids of <600 bp, resulting in a supernatant nucleic acid population between 500-600 bp. In some embodiments, the device is configured to selectively capture nucleic acid fragments between 250-600 bp, 250-275 bp, 275-300 bp, 300-325 bp, 325-350 bp, 350-375 bp, 375-400 bp, 400-425 bp, 425-450 bp, 450-475 bp, 475-500 bp, 500-525 bp, 525-550 bp, 550-575 bp, 575-600 bp, 300-400 bp, 400-500 bp, and/or 300-500 bp in length.

[00182] In some embodiments, the chip device is oriented vertically with a heater at the bottom edge which creates a temperature gradient column. In certain instances, the bottom is at denaturing temperature, the middle at annealing temperature, the top at extension temperature. In some instances, convection continually drives the process. In some embodiments, provided herein are methods or systems comprising an electrode design that specifically provides for electrothermal flows and acceleration of the process. In some embodiments, such design is optionally on the same device or on a separate device positioned appropriately. In some instances, active or passive cooling at the top, via fins or fans, or the like, provides a steep temperature gradient. In some instances, the device or system described herein comprises, or a method described herein uses, temperature sensors on the device or in the reaction chamber monitor temperature and such sensors are optionally used to adjust temperature on a feedback basis. In some instances, such sensors are coupled with materials possessing different thermal transfer properties to create continuous and/or discontinuous gradient profiles.

[00183] In some embodiments, the amplification proceeds at a constant temperature (i.e, isothermal amplification).

[00184] In some embodiments, the methods disclosed herein further comprise sequencing the nucleic acid isolated as disclosed herein. In some embodiments, the nucleic acid is sequenced by Sanger sequencing or next generation sequencing (NGS). In some embodiments, the next generation sequencing methods include, but are not limited to, pyrosequencing, ion semiconductor sequencing, polony sequencing, sequencing by ligation, DNA nanoball sequencing, sequencing by ligation, or single molecule sequencing.

[00185] In some embodiments, the isolated nucleic acids disclosed herein are used in Sanger sequencing. In some embodiments, Sanger sequencing is performed within the same device as the

nucleic acid isolation (Lab-on-Chip). Lab-on-Chip workflow for sample prep and Sanger sequencing results would incorporate the following steps: a) sample extraction using ACE chips; b) performing amplification of target sequences on chip; c) capture PCR products by ACE; d) perform cycle sequencing to enrich target strand; e) capture enriched target strands; f) perform Sanger chain termination reactions; perform electrophoretic separation of target sequences by capillary electrophoresis with on chip multi-color fluorescence detection. Washing nucleic acids, adding reagent, and turning off voltage is performed as necessary. Reactions can be performed on a single chip with plurality of capture zones or on separate chips and/or reaction chambers.

[00186] In some embodiments, the method disclosed herein further comprise performing a reaction on the nucleic acids (*e.g.*, fragmentation, restriction digestion, ligation of DNA or RNA). In some embodiments, the reaction occurs on or near the array or in a device, as disclosed herein.

Other Assays

[00187] The isolated nucleic acids disclosed herein may be further utilized in a variety of assay formats. For instance, devices which are addressed with nucleic acid probes or amplicons may be utilized in dot blot or reverse dot blot analyses, base-stacking single nucleotide polymorphism (SNP) analysis, SNP analysis with electronic stringency, or in STR analysis. In addition, such devices disclosed herein may be utilized in formats for enzymatic nucleic acid modification, or protein-nucleic acid interaction, such as, *e.g.*, gene expression analysis with enzymatic reporting, anchored nucleic acid amplification, or other nucleic acid modifications suitable for solid-phase formats including restriction endonuclease cleavage, endo- or exo-nuclease cleavage, minor groove binding protein assays, terminal transferase reactions, polynucleotide kinase or phosphatase reactions, ligase reactions, topoisomerase reactions, and other nucleic acid binding or modifying protein reactions.

[00188] In addition, the devices disclosed herein can be useful in immunoassays. For instance, in some embodiments, locations of the devices can be linked with antigens (*e.g.*, peptides, proteins, carbohydrates, lipids, proteoglycans, glycoproteins, etc.) in order to assay for antibodies in a bodily fluid sample by sandwich assay, competitive assay, or other formats. Alternatively, the locations of the device may be addressed with antibodies, in order to detect antigens in a sample by sandwich assay, competitive assay, or other assay formats. As the isoelectric point of antibodies and proteins can be determined fairly easily by experimentation or pH/charge computations, the electronic addressing and electronic concentration advantages of the devices may be utilized by simply adjusting the pH of the buffer so that the addressed or analyte species will be charged.

[00189] In additional aspects, the devices disclosed herein are useful in analysis of biomarkers via mass spectroscopy.

[00190] In some embodiments, the isolated nucleic acids are useful for use in immunoassay-type arrays or nucleic acid arrays.

Definitions and Abbreviations

[00191] The articles "a", "an" and "the" are non-limiting. For example, "the method" includes the broadest definition of the meaning of the phrase, which can be more than one method.

[00192] "Vpp" is the peak-to-peak voltage.

[00193] "DEP" is an abbreviation for dielectrophoresis.

EXAMPLES

EXAMPLE 1: Chip Construction

[00194] A 45x20 custom 80μm diameter circular platinum microelectrode array on 200 um center-center pitch was fabricated based upon previous results (see references 1-3, below). All 900 microelectrodes are activated together and AC biased to form a checkerboard field geometry. The positive DEP regions occur directly over microelectrodes, and negative low field regions occur between microelectrodes. The array is over-coated with a 200nm-500nm thick porous poly-Hema hydrogel layer (Procedure: 12% pHema in ethanol stock solution, purchased from PolySciences Inc., that is diluted to 5% using ethanol. 70uL of the 5% solution is spun on the above mentioned chip at a 6K RPM spin speed using a spin coater. The chip+hydrogel layer is then put in a 60 °C oven for 45 minutes) and enclosed in a microfluidic cartridge, forming a 50μL sample chamber covered with an acrylic window. Electrical connections to microelectrodes are accessed from Molex connectors from the PCB board in the flow cell. A function generator (HP 3245A) provided sinusoidal electrical signal at 10KHz and 10 - 14V peak-peak, depending on solution conductivity. Images were captured with a fluorescent microscope (Leica) and an EGFP cube (485 nm emission and 525 nm excitation bandpass filters). The excitation source was a PhotoFluor II 200W Hg arc lamp.

[00195] [1] R. Krishnan, B.D. Sullivan, R.L. Mifflin, S.C. Esener, and M.J. Heller, "Alternating current electrokinetic separation and detection of DNA nanoparticles in high-conductance solutions." Electrophoresis, vol. 29, pages 1765-1774, 2008.

[00196] [2] R. Krishnan and M.J. Heller, "An AC electrokinetic method for enhanced detection of DNA nanoparticles." J. Biophotonics, vol. 2, pages 253-261, 2009.

[00197] [3] R. Krishnan, D.A. Dehlinger, G.J. Gemmen, R.L. Mifflin, S.C. Esener, and M.J. Heller, "Interaction of nanoparticles at the DEP microelectrode interface under high conductance conditions" Electrochem. Comm., vol. 11, pages 1661-1666, 2009.

EXAMPLE 2: Biomarker Discovery Methods

[00198] A plasma sample was obtained from individuals having pancreatic cancer. Extracellular vesicles were isolated from a portion of the plasma samples and cell-free nucleic acids were obtained from the plasma sample using AC dielectrophoretic methods. Nucleic acids from the extracellular vesicles and the cell-free nucleic acids were subject to genomic profiling via next-generation sequencing. In parallel, proteins from the extracellular vesicles were subject to proteomic analysis via mass spectroscopy. Combined analysis when compared to plasma samples from healthy individuals lead to the discovery of biomarkers that were either overexpressed or under expressed in the sample were identified as biomarkers for pancreatic cancer. A flow diagram of the method is shown in FIG. 5. A cluster diagram and heat map of expression of various biomarkers is shown in FIG. 6.

EXAMPLE 3: Multi-Cancer Test

[00199] A multi-cancer test was developed to determine whether an individual has one of four different cancers with a single test. To validate this approach 247 early stage cancer patients and healthy controls were tested for various biomarkers. The breakdown of experimental subjects is shown in FIG. 7. The results are shown in FIG. 8 where 97% specificity and 87% sensitivity was shown overall with specificity for each cancer type and stage was established. This example shows that multiple cancers can be tested for in a single assay.

EXAMPLE 4: Detection of Cancer

[00200] Exosomes were isolated from blood plasma (FIG. 9A) of 134 treatment-naïve cancer patients (42-ovarian, 44-pancreatic, 48-bladder) and 110 healthy individuals (see Methods for details). All cancer patients were histopathologically confirmed per American Joint Commission on Cancer (AJCC) as stage I or stage II, with a median age of 59 years (Tables 1-2). Notably, 63% of the overall cancer (48%-pancreatic, 88%-ovarian and 56%-bladder) patients were stage I; the remaining 37%, stage II. There were also 25 stage IAs (60% of ovarian) in the ovarian cohort. The healthy individuals had no known history of cancer or autoimmune disease, with a median age of 53 years.

Table 1: Study Cohorts Overview

Group	Cohort	Histological subtype	n	%	Stage I (A/B/C)	Stage II (A/B)	Total, n	Gender	M:F	Age (Median)	BMI (Median)	Smokers (n, %)
Cancer	Pancreatic	adenocarcinoma	44	100%	21 (4/17/-)	23 (7/16)	44	12M, 32F	1:2.7	49-74 (62)	14.5-36.5 (24.7)	4 (9.1%)

	Ovarian Cancer	All Ovarian Cancers			37 (25/8/4)	5 (3/2)	42	0M, 42F	0:1	21-76 (51)	17.7-48.1 (29.2)	2 (4.8%)
		serous adenocarcinoma	22	52%	19 (13/4/2)	3 (1/2)						
		endometrioid adenocarcinoma	15	36%	13 (7/4/2)	2 (2/-)						
		mucinous adenocarcinoma	3	7%	3 (3/-/-)	-						
		clear cell adenocarcinoma	2	5%	2 (2/-/-)	-						
	Bladder Cancer	All Bladder Cancers			27	21	48	42M, 6F	7:1	40-76(62)	18-47.8 (27.2)	19(39.6%)
		urothelial carcinoma - low grade	15	31%	14	1						
		urothelial carcinoma - high grade	33	69%	13	20						
	All Cancer				85 (63%)	49 (37%)	134	54M, 80F	1:1.5	21-76 (59)	14.5-48.1 (27.0)	25 (18.7%)
Healthy	Healthy Controls	n/a	n/a	n/a	n/a	n/a	110	46M, 64F	1:1.4	40-71 (53)	21-37.8 (26.3)	12 (10.9%)
All	All	n/a	n/a	n/a	85	49	244	110 M, 144 F	1:1.3	21-76 (57)	14.5-48.1 (26.7)	37 (15.2%)

Table 2: Donor Histopathology and EXPLORE Performance

Subject Cohort ID	Age	Sex	Cohort	Histopathology	AJCC Stage	A/B/C	EXPLORE Logistic Regression*	At > 99% Specificity**	At 97% Specificity**	At 95% Specificity**
OVAR 001	52	F	ovarian cancer	serous adenocarcinoma	I	A	0.9270	Neg	Pos	Pos
OVAR 002	59	F	ovarian cancer	serous papillary cystadenocarcinoma	I	A	1.0000	Pos	Pos	Pos

OVAR 003	40	F	ovarian cancer	serous papillary cystadenocarcinoma	I	B	0.8777	Neg	Neg	Neg
OVAR 004	34	F	ovarian cancer	serous adenocarcinoma	I	A	0.9799	Neg	Pos	Pos
OVAR 005	63	F	ovarian cancer	serous papillary adenocarcinoma	I	C	0.9883	Pos	Pos	Pos
OVAR 006	23	F	ovarian cancer	serous papillary cystadenocarcinoma	I	A	0.0810	Neg	Neg	Neg
OVAR 007	26	F	ovarian cancer	serous papillary cystadenocarcinoma	I	A	1.0000	Pos	Pos	Pos
OVAR 008	59	F	ovarian cancer	serous cystadenocarcinoma	II	B	1.0000	Pos	Pos	Pos
OVAR 009	44	F	ovarian cancer	serous papillary adenocarcinoma	II	B	1.0000	Pos	Pos	Pos
OVAR 010	53	F	ovarian cancer	serous papillary cystadenocarcinoma	I	A	0.1335	Neg	Neg	Neg
OVAR 011	68	F	ovarian cancer	serous papillary cystadenocarcinoma	I	A	0.9981	Pos	Pos	Pos
OVAR 012	58	F	ovarian cancer	serous papillary cystadenocarcinoma	I	B	1.0000	Pos	Pos	Pos
OVAR 013	58	F	ovarian cancer	clear cell adenocarcinoma	I	A	0.1594	Neg	Neg	Neg
OVAR 014	44	F	ovarian cancer	endometrioid adenocarcinoma	I	B	0.9999	Pos	Pos	Pos
OVAR 015	67	F	ovarian cancer	endometrioid adenocarcinoma	I	B	1.0000	Pos	Pos	Pos
OVAR 016	61	F	ovarian cancer	endometrioid adenocarcinoma	I	A	0.9998	Pos	Pos	Pos
OVAR 017	47	F	ovarian cancer	endometrioid adenocarcinoma	I	A	0.9979	Pos	Pos	Pos
OVAR 018	48	F	ovarian cancer	endometrioid adenocarcinoma	I	A	0.9617	Neg	Pos	Pos

OVAR 019	64	F	ovarian cancer	serous adenocarcinoma	I	C	1.0000	Pos	Pos	Pos
OVAR 020	43	F	ovarian cancer	endometrioid adenocarcinoma	I	B	1.0000	Pos	Pos	Pos
OVAR 021	54	F	ovarian cancer	serous cystadenocarcinoma	I	A	0.9993	Pos	Pos	Pos
OVAR 022	61	F	ovarian cancer	Endometrioid adenocarcinoma	I	A	1.0000	Pos	Pos	Pos
OVAR 023	46	F	ovarian cancer	Endometrioid adenocarcinoma	II	A	0.9958	Pos	Pos	Pos
OVAR 024	74	F	ovarian cancer	Endometrioid adenocarcinoma	I	A	1.0000	Pos	Pos	Pos
OVAR 025	76	F	ovarian cancer	Endometrioid adenocarcinoma	I	C	1.0000	Pos	Pos	Pos
OVAR 026	48	F	ovarian cancer	endometrioid adenocarcinoma	I	C	0.5986	Neg	Neg	Neg
OVAR 027	40	F	ovarian cancer	serous adenocarcinoma	I	A	0.9767	Neg	Pos	Pos
OVAR 028	44	F	ovarian cancer	serous papillary adenocarcinoma	I	B	0.9854	Pos	Pos	Pos
OVAR 029	64	F	ovarian cancer	endometrioid adenocarcinoma	I	A	1.0000	Pos	Pos	Pos
OVAR 030	54	F	ovarian cancer	serous adenocarcinoma	I	B	0.9792	Neg	Pos	Pos
OVAR 032	68	F	ovarian cancer	mucinous adenocarcinoma	I	A	0.9988	Pos	Pos	Pos
OVAR 033	41	F	ovarian cancer	clear cell adenocarcinoma	I	A	0.9222	Neg	Pos	Pos
OVAR 034	59	F	ovarian cancer	serous adenocarcinoma	I	A	1.0000	Pos	Pos	Pos
OVAR 035	58	F	ovarian cancer	Mucinous adenocarcinoma	I	A	1.0000	Pos	Pos	Pos
OVAR 036	37	F	ovarian cancer	Mucinous cystadenocarcinoma	I	A	0.7666	Neg	Neg	Neg
OVAR 037	62	F	ovarian cancer	serous papillary cystadenocarcinoma	II	A	0.9662	Neg	Pos	Pos

OVAR 038	33	F	ovarian cancer	Serous and mucinous adenocarcinoma	I	A	0.9658	Neg	Pos	Pos
OVAR 039	67	F	ovarian cancer	serous adenocarcinoma	I	A	1.0000	Pos	Pos	Pos
OVAR 040	40	F	ovarian cancer	endometrioid adenocarcinoma	I	A	0.5037	Neg	Neg	Neg
OVAR 041	21	F	ovarian cancer	endometrioid adenocarcinoma	I	B	0.6192	Neg	Neg	Neg
OVAR 042	52	F	ovarian cancer	serous cystadenocarcinoma	I	A	0.9842	Pos	Pos	Pos
OVAR 043	52	F	ovarian cancer	endometrioid adenocarcinoma	II	A	1.0000	Pos	Pos	Pos
BLDR 001	65	M	bladder cancer	urothelial carcinoma	II		1.0000	Pos	Pos	Pos
BLDR 002	64	M	bladder cancer	urothelial carcinoma	I		0.9996	Pos	Pos	Pos
BLDR 003	70	M	bladder cancer	urothelial carcinoma	I		0.9995	Pos	Pos	Pos
BLDR 004	45	F	bladder cancer	urothelial carcinoma	I		0.9910	Pos	Pos	Pos
BLDR 005	57	M	bladder cancer	urothelial carcinoma	II		0.8134	Neg	Neg	Neg
BLDR 006	60	M	bladder cancer	urothelial carcinoma	I		0.7595	Neg	Neg	Neg
BLDR 007	72	F	bladder cancer	urothelial carcinoma	I		1.0000	Pos	Pos	Pos
BLDR 008	67	M	bladder cancer	urothelial carcinoma	II		0.5886	Neg	Neg	Neg
BLDR 009	76	M	bladder cancer	urothelial carcinoma	I		0.9632	Neg	Pos	Pos
BLDR 010	75	M	bladder cancer	urothelial carcinoma	II		0.8390	Neg	Neg	Neg
BLDR 011	63	M	bladder cancer	urothelial carcinoma	II		0.8272	Neg	Neg	Neg
BLDR 012	73	M	bladder cancer	urothelial carcinoma	II		0.1915	Neg	Neg	Neg
BLDR 013	57	M	bladder cancer	urothelial carcinoma	I		0.1970	Neg	Neg	Neg
BLDR 014	59	M	bladder cancer	urothelial carcinoma	I		0.9479	Neg	Pos	Pos

BLDR 015	70	M	bladder cancer	urothelial carcinoma	I		0.0090	Neg	Neg	Neg
BLDR 016	70	F	bladder cancer	urothelial carcinoma	I		0.7337	Neg	Neg	Neg
BLDR 017	48	M	bladder cancer	urothelial carcinoma	II		0.8991	Neg	Neg	Pos
BLDR 018	74	M	bladder cancer	urothelial carcinoma	I		0.9918	Pos	Pos	Pos
BLDR 019	62	M	bladder cancer	urothelial carcinoma	II		0.9995	Pos	Pos	Pos
BLDR 020	68	M	bladder cancer	urothelial carcinoma	II		0.9788	Neg	Pos	Pos
BLDR 021	62	M	bladder cancer	urothelial carcinoma	I		0.9999	Pos	Pos	Pos
BLDR 022	61	M	bladder cancer	urothelial carcinoma	I		0.0264	Neg	Neg	Neg
BLDR 023	63	M	bladder cancer	urothelial carcinoma	I		0.7452	Neg	Neg	Neg
BLDR 024	67	M	bladder cancer	urothelial carcinoma	I		0.9758	Neg	Pos	Pos
BLDR 025	60	F	bladder cancer	urothelial carcinoma	I		0.9689	Neg	Pos	Pos
BLDR 026	72	M	bladder cancer	urothelial carcinoma	II		1.0000	Pos	Pos	Pos
BLDR 027	66	M	bladder cancer	urothelial carcinoma	I		0.9996	Pos	Pos	Pos
BLDR 028	57	M	bladder cancer	urothelial carcinoma	I		0.2839	Neg	Neg	Neg
BLDR 029	54	M	bladder cancer	urothelial carcinoma	II		0.4066	Neg	Neg	Neg
BLDR 030	55	M	bladder cancer	urothelial carcinoma	II		0.8279	Neg	Neg	Neg
BLDR 031	53	M	bladder cancer	urothelial carcinoma	II		0.9331	Neg	Pos	Pos
BLDR 032	53	M	bladder cancer	urothelial carcinoma	II		0.2417	Neg	Neg	Neg
BLDR 033	72	M	bladder cancer	urothelial carcinoma	I		1.0000	Pos	Pos	Pos
BLDR 034	68	M	bladder cancer	urothelial carcinoma	II		0.9993	Pos	Pos	Pos
BLDR 035	63	M	bladder cancer	urothelial carcinoma	II		1.0000	Pos	Pos	Pos
BLDR 036	70	M	bladder cancer	urothelial carcinoma	I		1.0000	Pos	Pos	Pos

BLDR 037	58	M	bladder cancer	urothelial carcinoma	II		1.0000	Pos	Pos	Pos
BLDR 038	69	M	bladder cancer	urothelial carcinoma	II		1.0000	Pos	Pos	Pos
BLDR 039	73	M	bladder cancer	urothelial carcinoma	I		1.0000	Pos	Pos	Pos
BLDR 040	58	M	bladder cancer	urothelial carcinoma	I		0.9998	Pos	Pos	Pos
BLDR 041	40	F	bladder cancer	urothelial carcinoma	II		0.9927	Pos	Pos	Pos
BLDR 042	61	M	bladder cancer	urothelial carcinoma	II		0.2326	Neg	Neg	Neg
BLDR 043	63	M	bladder cancer	urothelial carcinoma	I		0.2862	Neg	Neg	Neg
BLDR 044	58	M	bladder cancer	urothelial carcinoma	I		0.9640	Neg	Pos	Pos
BLDR 045	63	M	bladder cancer	urothelial carcinoma	II		0.0154	Neg	Neg	Neg
BLDR 046	41	F	bladder cancer	urothelial carcinoma	I		0.3225	Neg	Neg	Neg
BLDR 047	68	M	bladder cancer	urothelial carcinoma	I		0.9998	Pos	Pos	Pos
BLDR 048	56	M	bladder cancer	urothelial carcinoma	I		0.9982	Pos	Pos	Pos
PDAC 001	60	F	pancreatic cancer	adenocarcinoma	I	A	0.9999	Pos	Pos	Pos
PDAC 002	49	F	pancreatic cancer	adenocarcinoma	II	B	0.9962	Pos	Pos	Pos
PDAC 003	65	F	pancreatic cancer	adenocarcinoma	II	A	1.0000	Pos	Pos	Pos
PDAC 004	60	F	pancreatic cancer	adenocarcinoma	II	A	1.0000	Pos	Pos	Pos
PDAC 005	58	F	pancreatic cancer	adenocarcinoma	II	A	0.8765	Neg	Neg	Neg
PDAC 006	56	F	pancreatic cancer	adenocarcinoma	II	B	0.9998	Pos	Pos	Pos
PDAC 007	66	F	pancreatic cancer	adenocarcinoma	II	A	1.0000	Pos	Pos	Pos
PDAC 008	63	F	pancreatic cancer	adenocarcinoma	II	B	1.0000	Pos	Pos	Pos
PDAC 009	59	F	pancreatic cancer	adenocarcinoma	II	B	1.0000	Pos	Pos	Pos
PDAC 010	65	F	pancreatic cancer	adenocarcinoma	I	B	1.0000	Pos	Pos	Pos

PDAC 011	57	M	pancreatic cancer	adenocarcinoma	II	B	1.0000	Pos	Pos	Pos
PDAC 012	64	F	pancreatic cancer	adenocarcinoma	I	B	0.9991	Pos	Pos	Pos
PDAC 013	55	F	pancreatic cancer	adenocarcinoma	I	B	1.0000	Pos	Pos	Pos
PDAC 014	66	F	pancreatic cancer	adenocarcinoma	II	A	1.0000	Pos	Pos	Pos
PDAC 015	68	F	pancreatic cancer	adenocarcinoma	II	B	0.9944	Pos	Pos	Pos
PDAC 016	68	M	pancreatic cancer	adenocarcinoma	I	B	1.0000	Pos	Pos	Pos
PDAC 017	59	F	pancreatic cancer	adenocarcinoma	II	B	0.9489	Neg	Pos	Pos
PDAC 018	66	M	pancreatic cancer	adenocarcinoma	II	B	1.0000	Pos	Pos	Pos
PDAC 019	68	F	pancreatic cancer	adenocarcinoma	II	B	1.0000	Pos	Pos	Pos
PDAC 020	52	M	pancreatic cancer	adenocarcinoma	I	A	1.0000	Pos	Pos	Pos
PDAC 021	64	F	pancreatic cancer	adenocarcinoma	I	B	1.0000	Pos	Pos	Pos
PDAC 022	56	F	pancreatic cancer	adenocarcinoma	II	B	1.0000	Pos	Pos	Pos
PDAC 023	50	F	pancreatic cancer	adenocarcinoma	II	B	0.9998	Pos	Pos	Pos
PDAC 024	49	M	pancreatic cancer	adenocarcinoma	II	B	1.0000	Pos	Pos	Pos
PDAC 025	63	F	pancreatic cancer	adenocarcinoma	II	B	1.0000	Pos	Pos	Pos
PDAC 026	70	F	pancreatic cancer	adenocarcinoma	II	B	0.9983	Pos	Pos	Pos
PDAC 027	57	F	pancreatic cancer	adenocarcinoma	II	B	0.9946	Pos	Pos	Pos
PDAC 028	61	F	pancreatic cancer	adenocarcinoma	II	B	1.0000	Pos	Pos	Pos
PDAC 029	71	F	pancreatic cancer	adenocarcinoma	I	B	1.0000	Pos	Pos	Pos
PDAC 030	59	M	pancreatic cancer	adenocarcinoma	I	B	1.0000	Pos	Pos	Pos
PDAC 031	61	F	pancreatic cancer	adenocarcinoma	I	B	0.9734	Neg	Pos	Pos
PDAC 032	60	F	pancreatic cancer	adenocarcinoma	I	A	0.9998	Pos	Pos	Pos

PDAC 033	72	M	pancreatic cancer	adenocarcinoma	I	B	1.0000	Pos	Pos	Pos
PDAC 034	64	M	pancreatic cancer	adenocarcinoma	I	B	1.0000	Pos	Pos	Pos
PDAC 035	70	F	pancreatic cancer	adenocarcinoma	I	B	1.0000	Pos	Pos	Pos
PDAC 036	72	F	pancreatic cancer	adenocarcinoma	I	B	1.0000	Pos	Pos	Pos
PDAC 037	58	M	pancreatic cancer	adenocarcinoma	I	B	1.0000	Pos	Pos	Pos
PDAC 038	64	F	pancreatic cancer	adenocarcinoma	I	B	0.9963	Pos	Pos	Pos
PDAC 039	74	M	pancreatic cancer	adenocarcinoma	I	A	1.0000	Pos	Pos	Pos
PDAC 040	66	F	pancreatic cancer	adenocarcinoma	I	B	0.9988	Pos	Pos	Pos
PDAC 041	69	M	pancreatic cancer	adenocarcinoma	I	B	0.9919	Pos	Pos	Pos
PDAC 042	59	F	pancreatic cancer	adenocarcinoma	I	B	0.9972	Pos	Pos	Pos
PDAC 043	74	F	pancreatic cancer	adenocarcinoma	II	A	1.0000	Pos	Pos	Pos
PDAC 044	59	M	pancreatic cancer	adenocarcinoma	II	A	1.0000	Pos	Pos	Pos
HC 001	61	F	healthy control				0.9854	Pos	Pos	Pos
HC 002	64	F	healthy control				0.0133	Neg	Neg	Neg
HC 003	71	F	healthy control				0.0001	Neg	Neg	Neg
HC 004	69	F	healthy control				0.8215	Neg	Neg	Neg
HC 005	70	F	healthy control				0.1141	Neg	Neg	Neg
HC 006	54	F	healthy control				0.0000	Neg	Neg	Neg
HC 007	50	F	healthy control				0.0544	Neg	Neg	Neg
HC 008	53	F	healthy control				0.0018	Neg	Neg	Neg
HC 009	62	M	healthy control				0.0049	Neg	Neg	Neg
HC 010	63	F	healthy control				0.0823	Neg	Neg	Neg
HC 011	60	M	healthy control				0.0108	Neg	Neg	Neg
HC 012	55	F	healthy control				0.0933	Neg	Neg	Neg
HC 013	65	F	healthy control				0.7494	Neg	Neg	Neg

HC 014	67	F	healthy control				0.0034	Neg	Neg	Neg
HC 015	63	F	healthy control				0.9028	Neg	Neg	Neg
HC 016	60	F	healthy control				0.0123	Neg	Neg	Neg
HC 017	65	M	healthy control				0.0061	Neg	Neg	Neg
HC 018	57	F	healthy control				0.0365	Neg	Neg	Neg
HC 019	55	F	healthy control				0.1680	Neg	Neg	Neg
HC 020	68	F	healthy control				0.0059	Neg	Neg	Neg
HC 021	65	F	healthy control				0.0672	Neg	Neg	Neg
HC 022	67	F	healthy control				0.0312	Neg	Neg	Neg
HC 023	70	F	healthy control				0.7480	Neg	Neg	Neg
HC 024	71	F	healthy control				0.0819	Neg	Neg	Neg
HC 025	60	M	healthy control				0.0006	Neg	Neg	Neg
HC 026	63	F	healthy control				0.1964	Neg	Neg	Neg
HC 028	65	M	healthy control				0.0001	Neg	Neg	Neg
HC 029	65	M	healthy control				0.8717	Neg	Neg	Neg
HC 030	61	F	healthy control				0.0025	Neg	Neg	Neg
HC 031	70	M	healthy control				0.3978	Neg	Neg	Neg
HC 032	60	M	healthy control				0.8952	Neg	Neg	Neg
HC 033	62	F	healthy control				0.0000	Neg	Neg	Neg
HC 034	65	F	healthy control				0.0074	Neg	Neg	Neg
HC 035	61	M	healthy control				0.0189	Neg	Neg	Neg
HC 036	67	F	healthy control				0.0000	Neg	Neg	Neg
HC 037	69	F	healthy control				0.0076	Neg	Neg	Neg
HC 038	70	M	healthy control				0.0000	Neg	Neg	Neg
HC 039	65	F	healthy control				0.0000	Neg	Neg	Neg
HC 040	71	F	healthy control				0.9821	Neg	Pos	Neg
HC 041	60	M	healthy control				0.0000	Neg	Neg	Neg
HC 042	63	M	healthy control				0.7679	Neg	Neg	Neg

HC 043	55	F	healthy control				0.0307	Neg	Neg	Neg
HC 044	60	M	healthy control				0.0002	Neg	Neg	Neg
HC 045	60	M	healthy control				0.0134	Neg	Neg	Neg
HC 046	54	F	healthy control				0.3174	Neg	Neg	Neg
HC 047	60	M	healthy control				0.4969	Neg	Neg	Neg
HC 048	59	F	healthy control				0.5460	Neg	Neg	Neg
HC 049	50	F	healthy control				0.0002	Neg	Neg	Neg
HC 050	50	M	healthy control				0.1443	Neg	Neg	Neg
HC 051	54	M	healthy control				0.0253	Neg	Neg	Neg
HC 052	54	F	healthy control				0.4239	Neg	Neg	Neg
HC 053	48	M	healthy control				0.1588	Neg	Neg	Neg
HC 054	44	M	healthy control				0.0006	Neg	Neg	Neg
HC 055	42	M	healthy control				0.0522	Neg	Neg	Neg
HC 056	46	M	healthy control				0.2665	Neg	Neg	Neg
HC 057	49	F	healthy control				0.0045	Neg	Neg	Neg
HC 058	42	F	healthy control				0.0000	Neg	Neg	Neg
HC 059	50	F	healthy control				0.0001	Neg	Neg	Neg
HC 060	49	F	healthy control				0.2130	Neg	Neg	Neg
HC 061	48	F	healthy control				0.2776	Neg	Neg	Neg
HC 062	48	M	healthy control				0.7137	Neg	Neg	Neg
HC 063	43	M	healthy control				0.9562	Neg	Pos	Neg
HC 064	48	M	healthy control				0.5076	Neg	Neg	Neg
HC 065	45	M	healthy control				0.0319	Neg	Neg	Neg
HC 066	44	F	healthy control				0.5744	Neg	Neg	Neg
HC 067	46	M	healthy control				0.0348	Neg	Neg	Neg
HC 068	42	M	healthy control				0.0000	Neg	Neg	Neg
HC 069	46	M	healthy control				0.0315	Neg	Neg	Neg
HC 070	47	M	healthy control				0.1190	Neg	Neg	Neg

HC 071	41	F	healthy control				0.0013	Neg	Neg	Neg
HC 072	49	M	healthy control				0.8005	Neg	Neg	Neg
HC 073	45	F	healthy control				0.0004	Neg	Neg	Neg
HC 074	46	F	healthy control				0.0057	Neg	Neg	Neg
HC 075	47	F	healthy control				0.0836	Neg	Neg	Neg
HC 076	50	M	healthy control				0.0002	Neg	Neg	Neg
HC 077	48	F	healthy control				0.0002	Neg	Neg	Neg
HC 078	48	F	healthy control				0.0019	Neg	Neg	Neg
HC 079	49	M	healthy control				0.0003	Neg	Neg	Neg
HC 080	47	F	healthy control				0.0008	Neg	Neg	Neg
HC 082	48	F	healthy control				0.0006	Neg	Neg	Neg
HC 084	43	M	healthy control				0.8909	Neg	Neg	Neg
HC 085	47	F	healthy control				0.0253	Neg	Neg	Neg
HC 086	49	M	healthy control				0.0041	Neg	Neg	Neg
HC 087	45	F	healthy control				0.0042	Neg	Neg	Neg
HC 088	45	F	healthy control				0.0552	Neg	Neg	Neg
HC 089	45	M	healthy control				0.1830	Neg	Neg	Neg
HC 090	43	M	healthy control				0.1206	Neg	Neg	Neg
HC 091	44	F	healthy control				0.0003	Neg	Neg	Neg
HC 092	40	M	healthy control				0.4735	Neg	Neg	Neg
HC 093	47	F	healthy control				0.0078	Neg	Neg	Neg
HC 094	48	M	healthy control				0.0668	Neg	Neg	Neg
HC 095	41	M	healthy control				0.0075	Neg	Neg	Neg
HC 096	48	M	healthy control				0.0000	Neg	Neg	Neg
HC 097	45	M	healthy control				0.0000	Neg	Neg	Neg
HC 098	45	F	healthy control				0.0075	Neg	Neg	Neg
HC 099	67	M	healthy control				0.0000	Neg	Neg	Neg
HC 100	60	F	healthy control				0.0006	Neg	Neg	Neg

HC 101	41	F	healthy control				0.4586	Neg	Neg	Neg
HC 102	45	F	healthy control				0.0065	Neg	Neg	Neg
HC 103	40	F	healthy control				0.1371	Neg	Neg	Neg
HC 104	45	F	healthy control				0.3566	Neg	Neg	Neg
HC 105	41	M	healthy control				0.0001	Neg	Neg	Neg
HC 106	44	M	healthy control				0.0000	Neg	Neg	Neg
HC 107	44	M	healthy control				0.0662	Neg	Neg	Neg
HC 108	41	F	healthy control				0.0001	Neg	Neg	Neg
HC 109	43	F	healthy control				0.3816	Neg	Neg	Neg
HC 110	42	F	healthy control				0.6466	Neg	Neg	Neg
HC 111	49	F	healthy control				0.4949	Neg	Neg	Neg
HC 112	40	F	healthy control				0.0169	Neg	Neg	Neg
HC 113	60	M	healthy control				0.2657	Neg	Neg	Neg
* Probability from representative logistic regression instance ** Pos/Neg Test results within confidence interval of Average ROC curve shown in Fig 2A										

[00201] Using existing literature on cancer-related proteins, 42 protein biomarkers were selected and 2 other factors (age and sex) for evaluation (Table 4). It was found that these proteins could be reproducibly evaluated through an immunoassay platform, and exo-protein levels of the 42 markers were measured in plasma of all subjects (Table 5). Particle size distribution and concentration confirmed equivalent exosome isolation in both cohorts (Table 3; FIG. 12). Protein abundance heatmaps for exo-proteins and free-proteins (total circulating plasma proteins) are shown in FIG. 13. All biomarkers in Table 4 were evaluated for inclusion into a logistic regression model developed to detect cancer at early stages - the EXPLORE test.

Table 3: Donor Histopathology and Exosome Characterization

Subject Cohort ID	Age	Sex	Cohort	Histopathology	AJCC Stage	A/B/C	EV particle concentration (particles/mL)	Median size of isolated EVs (nm)
OVAR 001	52	F	ovarian cancer	serous adenocarcinoma	I	A	4.31E+10	133.65

OVAR 002	59	F	ovarian cancer	serous papillary cystadenocarcinoma	I	A	2.73E+10	128.03
OVAR 003	40	F	ovarian cancer	serous papillary cystadenocarcinoma	I	B	2.65E+10	132.33
OVAR 004	34	F	ovarian cancer	serous adenocarcinoma	I	A	2.07E+10	134.67
OVAR 005	63	F	ovarian cancer	serous papillary adenocarcinoma	I	C	2.57E+10	149.88
OVAR 006	23	F	ovarian cancer	serous papillary cystadenocarcinoma	I	A	1.25E+10	130.35
OVAR 007	26	F	ovarian cancer	serous papillary cystadenocarcinoma	I	A	3.05E+10	125.13
OVAR 008	59	F	ovarian cancer	serous cystadenocarcinoma	II	B	3.10E+10	124.13
OVAR 009	44	F	ovarian cancer	serous papillary adenocarcinoma	II	B	2.80E+10	118.60
OVAR 010	53	F	ovarian cancer	serous papillary cystadenocarcinoma	I	A	1.21E+11	142.75
OVAR 011	68	F	ovarian cancer	serous papillary cystadenocarcinoma	I	A	3.30E+10	126.15
OVAR 012	58	F	ovarian cancer	serous papillary cystadenocarcinoma	I	B	2.14E+10	134.33
OVAR 013	58	F	ovarian cancer	clear cell adenocarcinoma	I	A	4.69E+10	111.95
OVAR 014	44	F	ovarian cancer	endometrioid adenocarcinoma	I	B	8.20E+10	102.55
OVAR 015	67	F	ovarian cancer	endometrioid adenocarcinoma	I	B	8.30E+10	106.05
OVAR 016	61	F	ovarian cancer	endometrioid adenocarcinoma	I	A	1.80E+11	121.58
OVAR 017	47	F	ovarian cancer	endometrioid adenocarcinoma	I	A	3.17E+11	113.33
OVAR 018	48	F	ovarian cancer	endometrioid adenocarcinoma	I	A	7.42E+10	119.73
OVAR 019	64	F	ovarian cancer	serous adenocarcinoma	I	C	2.00E+10	125.50
OVAR 020	43	F	ovarian cancer	endometrioid adenocarcinoma	I	B	2.35E+10	117.35
OVAR 021	54	F	ovarian cancer	serous cystadenocarcinoma	I	A	1.50E+10	122.75
OVAR 022	61	F	ovarian cancer	Endometrioid adenocarcinoma	I	A	6.10E+10	96.90
OVAR 023	46	F	ovarian cancer	Endometrioid adenocarcinoma	II	A	5.95E+10	109.95
OVAR 024	74	F	ovarian cancer	Endometrioid adenocarcinoma	I	A	5.90E+10	108.85
OVAR 025	76	F	ovarian cancer	Endometrioid adenocarcinoma	I	C	4.30E+10	110.20

OVAR 026	48	F	ovarian cancer	endometrioid adenocarcinoma	I	C	4.10E+10	111.05
OVAR 027	40	F	ovarian cancer	serous adenocarcinoma	I	A	5.00E+10	102.37
OVAR 028	44	F	ovarian cancer	serous papillary adenocarcinoma	I	B	1.45E+10	124.80
OVAR 029	64	F	ovarian cancer	endometrioid adenocarcinoma	I	A	2.31E+10	117.45
OVAR 030	54	F	ovarian cancer	serous adenocarcinoma	I	B	3.50E+10	119.85
OVAR 032	68	F	ovarian cancer	mucinous adenocarcinoma	I	A	5.18E+09	141.18
OVAR 033	41	F	ovarian cancer	clear cell adenocarcinoma	I	A	6.95E+09	130.85
OVAR 034	59	F	ovarian cancer	serous adenocarcinoma	I	A	7.55E+09	145.70
OVAR 035	58	F	ovarian cancer	Mucinous adenocarcinoma	I	A	7.70E+10	104.50
OVAR 036	37	F	ovarian cancer	Mucinous cystadenocarcinoma	I	A	4.30E+10	90.70
OVAR 037	62	F	ovarian cancer	serous papillary cystadenocarcinoma	II	A	1.05E+10	122.85
OVAR 038	33	F	ovarian cancer	Serous and mucinous adenocarcinoma	I	A	#N/A	#N/A
OVAR 039	67	F	ovarian cancer	serous adenocarcinoma	I	A	4.90E+09	161.70
OVAR 040	40	F	ovarian cancer	endometrioid adenocarcinoma	I	A	3.29E+10	137.23
OVAR 041	21	F	ovarian cancer	endometrioid adenocarcinoma	I	B	2.67E+10	164.53
OVAR 042	52	F	ovarian cancer	serous cystadenocarcinoma	I	A	6.13E+09	142.30
OVAR 043	52	F	ovarian cancer	endometrioid adenocarcinoma	II	A	7.83E+09	140.07
BLDR 001	65	M	bladder cancer	urothelial carcinoma	II		1.69E+11	124.18
BLDR 002	64	M	bladder cancer	urothelial carcinoma	I		1.37E+10	132.06
BLDR 003	70	M	bladder cancer	urothelial carcinoma	I		1.14E+11	112.30
BLDR 004	45	F	bladder cancer	urothelial carcinoma	I		1.35E+10	159.63
BLDR 005	57	M	bladder cancer	urothelial carcinoma	II		3.81E+11	114.20
BLDR 006	60	M	bladder cancer	urothelial carcinoma	I		1.98E+11	109.10
BLDR 007	72	F	bladder cancer	urothelial carcinoma	I		2.10E+10	112.70
BLDR 008	67	M	bladder cancer	urothelial carcinoma	II		2.16E+10	128.47
BLDR 009	76	M	bladder cancer	urothelial carcinoma	I		2.74E+10	129.80

BLDR 010	75	M	bladder cancer	urothelial carcinoma	II		5.05E+10	115.93
BLDR 011	63	M	bladder cancer	urothelial carcinoma	II		3.43E+10	136.43
BLDR 012	73	M	bladder cancer	urothelial carcinoma	II		7.60E+10	101.90
BLDR 013	57	M	bladder cancer	urothelial carcinoma	I		8.70E+10	122.40
BLDR 014	59	M	bladder cancer	urothelial carcinoma	I		5.88E+10	113.65
BLDR 015	70	M	bladder cancer	urothelial carcinoma	I		1.05E+11	132.67
BLDR 016	70	F	bladder cancer	urothelial carcinoma	I		2.00E+10	119.10
BLDR 017	48	M	bladder cancer	urothelial carcinoma	II		2.23E+10	135.93
BLDR 018	74	M	bladder cancer	urothelial carcinoma	I		1.30E+10	126.50
BLDR 019	62	M	bladder cancer	urothelial carcinoma	II		2.03E+10	123.97
BLDR 020	68	M	bladder cancer	urothelial carcinoma	II		1.90E+10	131.20
BLDR 021	62	M	bladder cancer	urothelial carcinoma	I		2.70E+11	129.33
BLDR 022	61	M	bladder cancer	urothelial carcinoma	I		1.96E+10	119.85
BLDR 023	63	M	bladder cancer	urothelial carcinoma	I		5.43E+09	134.17
BLDR 024	67	M	bladder cancer	urothelial carcinoma	I		7.78E+09	135.78
BLDR 025	60	F	bladder cancer	urothelial carcinoma	I		2.90E+10	117.03
BLDR 026	72	M	bladder cancer	urothelial carcinoma	II		9.60E+09	133.97
BLDR 027	66	M	bladder cancer	urothelial carcinoma	I		3.00E+07	109.90
BLDR 028	57	M	bladder cancer	urothelial carcinoma	I		2.35E+09	135.55
BLDR 029	54	M	bladder cancer	urothelial carcinoma	II		1.31E+10	130.50
BLDR 030	55	M	bladder cancer	urothelial carcinoma	II		1.31E+10	134.52
BLDR 031	53	M	bladder cancer	urothelial carcinoma	II		3.62E+10	113.85
BLDR 032	53	M	bladder cancer	urothelial carcinoma	II		4.50E+10	99.10
BLDR 033	72	M	bladder cancer	urothelial carcinoma	I		3.90E+10	122.55
BLDR 034	68	M	bladder cancer	urothelial carcinoma	II		1.43E+10	128.37
BLDR 035	63	M	bladder cancer	urothelial carcinoma	II		3.86E+10	115.72
BLDR 036	70	M	bladder cancer	urothelial carcinoma	I		5.00E+10	103.80
BLDR 037	58	M	bladder cancer	urothelial carcinoma	II		2.32E+10	118.30

BLDR 038	69	M	bladder cancer	urothelial carcinoma	II		2.83E+10	120.53
BLDR 039	73	M	bladder cancer	urothelial carcinoma	I		4.38E+10	102.60
BLDR 040	58	M	bladder cancer	urothelial carcinoma	I		1.66E+10	119.18
BLDR 041	40	F	bladder cancer	urothelial carcinoma	II		2.70E+10	118.70
BLDR 042	61	M	bladder cancer	urothelial carcinoma	II		8.27E+09	131.43
BLDR 043	63	M	bladder cancer	urothelial carcinoma	I		1.14E+10	124.03
BLDR 044	58	M	bladder cancer	urothelial carcinoma	I		4.70E+10	101.47
BLDR 045	63	M	bladder cancer	urothelial carcinoma	II		5.47E+09	156.10
BLDR 046	41	F	bladder cancer	urothelial carcinoma	I		1.70E+10	154.80
BLDR 047	68	M	bladder cancer	urothelial carcinoma	I		9.98E+09	129.48
BLDR 048	56	M	bladder cancer	urothelial carcinoma	I		6.05E+10	139.90
PDAC 001	60	F	pancreatic cancer	adenocarcinoma	I	A	6.50E+10	114.75
PDAC 002	49	F	pancreatic cancer	adenocarcinoma	II	B	1.25E+10	127.14
PDAC 003	65	F	pancreatic cancer	adenocarcinoma	II	A	1.97E+10	126.15
PDAC 004	60	F	pancreatic cancer	adenocarcinoma	II	A	3.40E+10	163.53
PDAC 005	58	F	pancreatic cancer	adenocarcinoma	II	A	5.46E+10	124.40
PDAC 006	56	F	pancreatic cancer	adenocarcinoma	II	B	9.03E+09	139.20
PDAC 007	66	F	pancreatic cancer	adenocarcinoma	II	A	7.76E+09	139.22
PDAC 008	63	F	pancreatic cancer	adenocarcinoma	II	B	1.00E+11	121.38
PDAC 009	59	F	pancreatic cancer	adenocarcinoma	II	B	1.38E+10	146.10
PDAC 010	65	F	pancreatic cancer	adenocarcinoma	I	B	9.73E+09	153.43
PDAC 011	57	M	pancreatic cancer	adenocarcinoma	II	B	3.23E+10	135.57
PDAC 012	64	F	pancreatic cancer	adenocarcinoma	I	B	2.30E+10	151.73
PDAC 013	55	F	pancreatic cancer	adenocarcinoma	I	B	2.00E+10	152.45
PDAC 014	66	F	pancreatic cancer	adenocarcinoma	II	A	7.40E+10	146.58
PDAC 015	68	F	pancreatic cancer	adenocarcinoma	II	B	5.40E+10	138.70
PDAC 016	68	M	pancreatic cancer	adenocarcinoma	I	B	2.21E+10	155.20
PDAC 017	59	F	pancreatic cancer	adenocarcinoma	II	B	6.58E+09	127.98

PDAC 018	66	M	pancreatic cancer	adenocarcinoma	II	B	2.63E+10	140.54
PDAC 019	68	F	pancreatic cancer	adenocarcinoma	II	B	2.03E+10	123.80
PDAC 020	52	M	pancreatic cancer	adenocarcinoma	I	A	5.41E+10	137.23
PDAC 021	64	F	pancreatic cancer	adenocarcinoma	I	B	7.13E+09	141.80
PDAC 022	56	F	pancreatic cancer	adenocarcinoma	II	B	1.81E+11	114.98
PDAC 023	50	F	pancreatic cancer	adenocarcinoma	II	B	3.70E+10	126.30
PDAC 024	49	M	pancreatic cancer	adenocarcinoma	II	B	1.60E+10	147.70
PDAC 025	63	F	pancreatic cancer	adenocarcinoma	II	B	1.00E+10	137.50
PDAC 026	70	F	pancreatic cancer	adenocarcinoma	II	B	7.75E+10	95.30
PDAC 027	57	F	pancreatic cancer	adenocarcinoma	II	B	1.01E+11	113.65
PDAC 028	61	F	pancreatic cancer	adenocarcinoma	II	B	7.53E+10	78.37
PDAC 029	71	F	pancreatic cancer	adenocarcinoma	I	B	2.24E+10	139.80
PDAC 030	59	M	pancreatic cancer	adenocarcinoma	I	B	2.86E+10	108.80
PDAC 031	61	F	pancreatic cancer	adenocarcinoma	I	B	3.48E+10	161.60
PDAC 032	60	F	pancreatic cancer	adenocarcinoma	I	A	1.95E+11	138.95
PDAC 033	72	M	pancreatic cancer	adenocarcinoma	I	B	2.28E+10	127.05
PDAC 034	64	M	pancreatic cancer	adenocarcinoma	I	B	2.57E+10	123.48
PDAC 035	70	F	pancreatic cancer	adenocarcinoma	I	B	7.37E+09	149.93
PDAC 036	72	F	pancreatic cancer	adenocarcinoma	I	B	3.53E+09	139.13
PDAC 037	58	M	pancreatic cancer	adenocarcinoma	I	B	3.70E+09	145.00
PDAC 038	64	F	pancreatic cancer	adenocarcinoma	I	B	1.03E+11	133.33
PDAC 039	74	M	pancreatic cancer	adenocarcinoma	I	A	2.63E+10	146.00
PDAC 040	66	F	pancreatic cancer	adenocarcinoma	I	B	2.33E+10	165.83
PDAC 041	69	M	pancreatic cancer	adenocarcinoma	I	B	5.13E+10	155.60
PDAC 042	59	F	pancreatic cancer	adenocarcinoma	I	B	3.17E+10	140.20
PDAC 043	74	F	pancreatic cancer	adenocarcinoma	II	A	5.36E+10	120.38
PDAC 044	59	M	pancreatic cancer	adenocarcinoma	II	A	4.45E+10	116.85
HC 001	61	F	healthy control				3.45E+10	102.10

HC 002	64	F	healthy control				7.50E+09	147.55
HC 003	71	F	healthy control				6.72E+11	129.75
HC 004	69	F	healthy control				4.85E+10	116.45
HC 005	70	F	healthy control				5.25E+10	125.55
HC 006	54	F	healthy control				2.90E+10	115.10
HC 007	50	F	healthy control				1.30E+10	141.05
HC 008	53	F	healthy control				5.30E+10	120.75
HC 009	62	M	healthy control				6.90E+09	136.75
HC 010	63	F	healthy control				4.40E+10	122.75
HC 011	60	M	healthy control				1.80E+10	123.10
HC 012	55	F	healthy control				#N/A	#N/A
HC 013	65	F	healthy control				3.40E+10	110.00
HC 014	67	F	healthy control				#N/A	#N/A
HC 015	63	F	healthy control				1.90E+10	115.20
HC 016	60	F	healthy control				1.26E+10	141.50
HC 017	65	M	healthy control				2.25E+10	130.55
HC 018	57	F	healthy control				1.95E+10	135.10
HC 019	55	F	healthy control				1.70E+10	152.90
HC 020	68	F	healthy control				5.40E+10	119.70
HC 021	65	F	healthy control				1.51E+11	116.33
HC 022	67	F	healthy control				1.13E+11	109.00
HC 023	70	F	healthy control				6.62E+11	105.55
HC 024	71	F	healthy control				1.74E+11	106.73
HC 025	60	M	healthy control				6.30E+10	113.05
HC 026	63	F	healthy control				9.63E+09	133.60
HC 028	65	M	healthy control				1.00E+11	114.20
HC 029	65	M	healthy control				7.60E+10	125.38
HC 030	61	F	healthy control				7.10E+10	90.10

HC 031	70	M	healthy control				8.07E+10	86.67
HC 032	60	M	healthy control				1.46E+10	121.23
HC 033	62	F	healthy control				7.30E+10	102.07
HC 034	65	F	healthy control				3.37E+10	105.73
HC 035	61	M	healthy control				3.70E+10	114.57
HC 036	67	F	healthy control				8.15E+10	100.28
HC 037	69	F	healthy control				5.33E+10	101.97
HC 038	70	M	healthy control				5.90E+10	111.33
HC 039	65	F	healthy control				9.10E+10	94.47
HC 040	71	F	healthy control				1.77E+14	116.43
HC 041	60	M	healthy control				5.27E+10	102.90
HC 042	63	M	healthy control				4.40E+14	102.90
HC 043	55	F	healthy control				1.14E+10	132.65
HC 044	60	M	healthy control				1.80E+10	132.30
HC 045	60	M	healthy control				2.15E+10	116.80
HC 046	54	F	healthy control				2.15E+10	125.20
HC 047	60	M	healthy control				2.20E+10	131.75
HC 048	59	F	healthy control				1.90E+10	114.25
HC 049	50	F	healthy control				2.90E+10	125.65
HC 050	50	M	healthy control				#N/A	#N/A
HC 051	54	M	healthy control				3.52E+10	112.75
HC 052	54	F	healthy control				#N/A	#N/A
HC 053	48	M	healthy control				1.30E+10	126.80
HC 054	44	M	healthy control				1.11E+10	132.58
HC 055	42	M	healthy control				3.78E+10	105.40
HC 056	46	M	healthy control				2.03E+14	103.63
HC 057	49	F	healthy control				3.32E+10	118.60
HC 058	42	F	healthy control				4.68E+10	118.43

HC 059	50	F	healthy control				2.45E+10	122.05
HC 060	49	F	healthy control				2.85E+11	113.80
HC 061	48	F	healthy control				3.25E+09	145.55
HC 062	48	M	healthy control				5.30E+09	142.70
HC 063	43	M	healthy control				4.70E+09	149.50
HC 064	48	M	healthy control				4.80E+09	140.00
HC 065	45	M	healthy control				4.30E+09	144.80
HC 066	44	F	healthy control				3.80E+09	158.90
HC 067	46	M	healthy control				3.60E+10	109.80
HC 068	42	M	healthy control				3.05E+10	132.80
HC 069	46	M	healthy control				6.68E+09	137.45
HC 070	47	M	healthy control				2.80E+10	132.23
HC 071	41	F	healthy control				9.50E+09	121.00
HC 072	49	M	healthy control				8.90E+10	119.90
HC 073	45	F	healthy control				8.50E+09	128.70
HC 074	46	F	healthy control				1.20E+10	119.90
HC 075	47	F	healthy control				4.12E+10	123.30
HC 076	50	M	healthy control				7.67E+09	149.73
HC 077	48	F	healthy control				4.60E+10	116.65
HC 078	48	F	healthy control				4.70E+10	113.80
HC 079	49	M	healthy control				3.52E+10	125.95
HC 080	47	F	healthy control				3.65E+10	124.30
HC 082	48	F	healthy control				3.50E+10	104.10
HC 084	43	M	healthy control				1.59E+10	139.38
HC 085	47	F	healthy control				8.40E+09	135.60
HC 086	49	M	healthy control				5.05E+10	122.10
HC 087	45	F	healthy control				3.40E+10	111.50
HC 088	45	F	healthy control				5.30E+09	147.85

HC 089	45	M	healthy control				1.58E+10	143.98
HC 090	43	M	healthy control				2.67E+10	134.60
HC 091	44	F	healthy control				4.00E+10	108.90
HC 092	40	M	healthy control				3.70E+10	135.30
HC 093	47	F	healthy control				9.13E+09	130.30
HC 094	48	M	healthy control				5.48E+10	119.35
HC 095	41	M	healthy control				3.67E+14	107.87
HC 096	48	M	healthy control				3.41E+11	107.90
HC 097	45	M	healthy control				3.90E+11	107.80
HC 098	45	F	healthy control				5.30E+09	136.90
HC 099	67	M	healthy control				2.98E+10	126.70
HC 100	60	F	healthy control				1.41E+10	141.43
HC 101	41	F	healthy control				#N/A	#N/A
HC 102	45	F	healthy control				3.40E+10	98.30
HC 103	40	F	healthy control				1.72E+10	137.33
HC 104	45	F	healthy control				3.70E+09	146.70
HC 105	41	M	healthy control				1.15E+10	120.35
HC 106	44	M	healthy control				7.88E+10	112.58
HC 107	44	M	healthy control				3.77E+09	128.93
HC 108	41	F	healthy control				5.67E+09	133.00
HC 109	43	F	healthy control				5.03E+09	138.23
HC 110	42	F	healthy control				2.25E+10	125.25
HC 111	49	F	healthy control				7.30E+09	128.90
HC 112	40	F	healthy control				8.70E+09	139.30
HC 113	60	M	healthy control				6.67E+13	134.93

Table 4: Proteins Measured in Immunoassay

Protein biomarker	Evaluated in cancer and healthy individuals	Included in EXPLORE test	Patient-related biomarker	Evaluated in cancer and healthy individuals	Included in EXPLORE test
Tenascin C	Yes	No	Age at time of collection	Yes	Yes
sAXL	Yes	No	Sex of individual	Yes	No
sE-selectin	Yes	Yes			
sHGFR/c-Met	Yes	No			
sHer2	Yes	Yes			
sHer3	Yes	No			
sIL-6Ra	Yes	No			
sNeuropilin-1	Yes	Yes			
sPECAM-1	Yes	No			
sVEGFR1	Yes	Yes			
sVEGFR3	Yes	No			
sc-kit/SCFR	Yes	Yes			
CA 125	Yes	No			
CA 15-3	Yes	No			
CA 19-9	Yes	Yes			
CEA	Yes	No			
FGF2	Yes	No			
HE4	Yes	No			
HGF	Yes	No			
IL-6	Yes	No			
IL-8	Yes	No			
Leptin	Yes	No			
MIF	Yes	No			
OPN	Yes	No			
Prolactin	Yes	No			
SCF	Yes	No			
TNFa	Yes	No			
TRAIL	Yes	No			
Total PSA	Yes	No			
VEGF	Yes	No			
b-HCG	Yes	No			
sFAS	Yes	Yes			
Cathepsin D	Yes	Yes			
FAP alpha	Yes	No			
Ferritin	Yes	Yes			
Galectin-3	Yes	No			
IGFBP3	Yes	Yes			
MIA	Yes	Yes			

MPO	Yes	Yes			
SHBG	Yes	No			
TIMP1	Yes	Yes			
TIMP2	Yes	No			

Table 5: Protein concentrations in plasma samples for cancer donors and healthy controls

Subject Cohort ID	Sample Type	Tumor type	AJCC Stage	A/B/C	Tenascin C	sAXL	sE-selectin
OVAR 001	Exosomal Protein	Ovarian	I	A	570.84	5.60	529.35
OVAR 002	Exosomal Protein	Ovarian	I	A	909.63	5.60	277.22
OVAR 003	Exosomal Protein	Ovarian	I	B	871.12	5.60	366.33
OVAR 004	Exosomal Protein	Ovarian	I	A	20.20	5.60	247.80
OVAR 005	Exosomal Protein	Ovarian	I	C	755.39	5.60	751.42
OVAR 006	Exosomal Protein	Ovarian	I	A	1493.60	5.60	291.26
OVAR 007	Exosomal Protein	Ovarian	I	A	762.23	5.60	291.26
OVAR 008	Exosomal Protein	Ovarian	II	B	20.20	5.60	247.80
OVAR 009	Exosomal Protein	Ovarian	II	B	1200.95	5.60	247.80
OVAR 010	Exosomal Protein	Ovarian	I	A	20.20	5.60	247.80
OVAR 011	Exosomal Protein	Ovarian	I	A	91.82	5.60	247.80
OVAR 012	Exosomal Protein	Ovarian	I	B	803.31	5.60	247.80
OVAR 013	Exosomal Protein	Ovarian	I	A	20.20	8.72	1537.83
OVAR 014	Exosomal Protein	Ovarian	I	B	1235.54	5.60	1074.19
OVAR 015	Exosomal Protein	Ovarian	I	B	20.20	5.60	410.09
OVAR 016	Exosomal Protein	Ovarian	I	A	20.20	5.60	247.80
OVAR 017	Exosomal Protein	Ovarian	I	A	20.20	5.60	615.92
OVAR 018	Exosomal Protein	Ovarian	I	A	515.16	5.60	256.02
OVAR 019	Exosomal Protein	Ovarian	I	C	685.70	5.60	247.80
OVAR 020	Exosomal Protein	Ovarian	I	B	404.70	5.60	247.80

OVAR 021	Exosomal Protein	Ovarian	I	A	253.39	8.62	496.83
OVAR 022	Exosomal Protein	Ovarian	I	A	213.09	5.60	496.83
OVAR 023	Exosomal Protein	Ovarian	II	A	388.52	15.83	12692.00
OVAR 024	Exosomal Protein	Ovarian	I	A	631.36	9.93	586.58
OVAR 025	Exosomal Protein	Ovarian	I	C	731.02	5.60	435.29
OVAR 026	Exosomal Protein	Ovarian	I	C	301.26	14.51	273.13
OVAR 027	Exosomal Protein	Ovarian	I	A	20.20	6.97	2333.89
OVAR 028	Exosomal Protein	Ovarian	I	B	484.35	5.60	391.24
OVAR 029	Exosomal Protein	Ovarian	I	A	531.91	5.60	247.80
OVAR 030	Exosomal Protein	Ovarian	I	B	754.37	5.60	977.96
OVAR 031	Exosomal Protein	Ovarian	I	A	2513.03	5.60	1220.41
OVAR 032	Exosomal Protein	Ovarian	I	A	692.66	5.60	247.80
OVAR 033	Exosomal Protein	Ovarian	I	A	252.77	5.60	247.80
OVAR 034	Exosomal Protein	Ovarian	I	A	914.14	5.60	559.24
OVAR 035	Exosomal Protein	Ovarian	I	A	20.20	12.35	1220.41
OVAR 036	Exosomal Protein	Ovarian	I	A	2797.86	6.10	1220.41
OVAR 037	Exosomal Protein	Ovarian	II	A	20.20	5.60	247.80
OVAR 038	Exosomal Protein	Ovarian	I	A	336.88	5.60	247.80
OVAR 039	Exosomal Protein	Ovarian	I	A	20.20	5.60	247.80
OVAR 040	Exosomal Protein	Ovarian	I	A	20.20	8.11	483.75
OVAR 041	Exosomal Protein	Ovarian	I	B	258.96	5.60	259.94
OVAR 042	Exosomal Protein	Ovarian	I	A	953.99	6.24	410.09

OVAR 043	Exosomal Protein	Ovarian	II	A	20.20	5.60	410.09
OVAR 044	Exosomal Protein	Ovarian	I	C2	376.44	5.60	638.62
BLDR 001	Exosomal Protein	Bladder	II		20.20	7.60	371.26
BLDR 002	Exosomal Protein	Bladder	I		760.85	5.60	277.22
BLDR 003	Exosomal Protein	Bladder	I		623.45	5.60	247.80
BLDR 004	Exosomal Protein	Bladder	I		20.20	5.60	559.24
BLDR 005	Exosomal Protein	Bladder	II		20.20	7.85	1445.50
BLDR 006	Exosomal Protein	Bladder	I		20.20	5.60	1553.06
BLDR 007	Exosomal Protein	Bladder	I		819.94	5.60	421.41
BLDR 008	Exosomal Protein	Bladder	II		20.20	5.60	398.87
BLDR 009	Exosomal Protein	Bladder	I		760.85	5.60	247.80
BLDR 010	Exosomal Protein	Bladder	II		20.20	5.60	247.80
BLDR 011	Exosomal Protein	Bladder	II		663.94	5.60	528.29
BLDR 012	Exosomal Protein	Bladder	II		20.20	57.54	3091.22
BLDR 013	Exosomal Protein	Bladder	I		547.88	14.30	1012.37
BLDR 014	Exosomal Protein	Bladder	I		20.20	5.60	435.29
BLDR 015	Exosomal Protein	Bladder	I		1034.60	5.60	709.25
BLDR 016	Exosomal Protein	Bladder	I		585.84	5.60	270.54
BLDR 017	Exosomal Protein	Bladder	II		1029.49	5.60	788.30
BLDR 018	Exosomal Protein	Bladder	I		1958.90	5.60	1334.78
BLDR 019	Exosomal Protein	Bladder	II		20.20	5.60	371.26
BLDR 020	Exosomal Protein	Bladder	II		20.20	5.60	247.80

BLDR 021	Exosomal Protein	Bladder	I		412.15	5.60	391.24
BLDR 022	Exosomal Protein	Bladder	I		20.20	5.60	450.82
BLDR 023	Exosomal Protein	Bladder	I		698.46	5.60	615.92
BLDR 024	Exosomal Protein	Bladder	I		1016.96	5.60	247.80
BLDR 025	Exosomal Protein	Bladder	I		20.20	5.60	247.80
BLDR 026	Exosomal Protein	Bladder	II		20.20	6.24	311.32
BLDR 027	Exosomal Protein	Bladder	I		20.20	5.60	455.35
BLDR 028	Exosomal Protein	Bladder	I		20.20	7.02	754.26
BLDR 029	Exosomal Protein	Bladder	II		305.85	5.60	247.80
BLDR 030	Exosomal Protein	Bladder	II		20.20	5.60	366.33
BLDR 031	Exosomal Protein	Bladder	II		20.20	5.60	490.03
BLDR 032	Exosomal Protein	Bladder	II		216.25	14.14	642.34
BLDR 033	Exosomal Protein	Bladder	I		20.20	5.60	247.80
BLDR 034	Exosomal Protein	Bladder	II		20.20	5.60	247.80
BLDR 035	Exosomal Protein	Bladder	II		20.20	5.63	1412.22
BLDR 036	Exosomal Protein	Bladder	I		835.18	5.99	273.13
BLDR 037	Exosomal Protein	Bladder	II		20.20	5.60	564.22
BLDR 038	Exosomal Protein	Bladder	II		385.67	5.60	289.62
BLDR 039	Exosomal Protein	Bladder	I		20.20	5.60	371.26
BLDR 040	Exosomal Protein	Bladder	I		20.20	5.60	247.80
BLDR 041	Exosomal Protein	Bladder	II		20.20	6.24	1140.86
BLDR 042	Exosomal Protein	Bladder	II		497.48	5.60	531.84

BLDR 043	Exosomal Protein	Bladder	I		20.20	9.95	1140.86
BLDR 044	Exosomal Protein	Bladder	I		20.20	11.18	638.62
BLDR 045	Exosomal Protein	Bladder	II		1359.62	5.62	638.62
BLDR 046	Exosomal Protein	Bladder	I		20.20	5.60	1101.76
BLDR 047	Exosomal Protein	Bladder	I		20.20	5.60	247.80
BLDR 048	Exosomal Protein	Bladder	I		1015.29	5.60	247.80
PDAC 001	Exosomal Protein	Pancreatic	I	A	903.37	5.60	559.24
PDAC 002	Exosomal Protein	Pancreatic	II	B	20.20	7.85	1958.37
PDAC 003	Exosomal Protein	Pancreatic	II	A	20.20	5.60	391.24
PDAC 004	Exosomal Protein	pancreatic	II	A	20.20	5.60	247.80
PDAC 005	Exosomal Protein	Pancreatic	II	A	20.20	5.60	977.96
PDAC 006	Exosomal Protein	Pancreatic	II	B	748.51	5.60	339.72
PDAC 007	Exosomal Protein	Pancreatic	II	A	1289.36	5.60	339.72
PDAC 008	Exosomal Protein	Pancreatic	II	B	684.32	5.60	483.75
PDAC 009	Exosomal Protein	Pancreatic	II	B	20.20	5.60	247.80
PDAC 010	Exosomal Protein	pancreatic	I	B	826.24	5.60	365.27
PDAC 011	Exosomal Protein	Pancreatic	II	B	1254.43	5.60	692.21
PDAC 012	Exosomal Protein	pancreatic	I	B	20.20	5.60	247.80
PDAC 013	Exosomal Protein	pancreatic	I	B	20.20	5.60	1101.76
PDAC 014	Exosomal Protein	pancreatic	II	A	20.20	5.60	247.80
PDAC 015	Exosomal Protein	Pancreatic	II	B	944.44	9.01	1386.39
PDAC 016	Exosomal Protein	pancreatic	I	B	424.84	5.60	366.33

PDAC 017	Exosomal Protein	Pancreatic	II	B	297.57	5.60	247.80
PDAC 018	Exosomal Protein	Pancreatic	II	B	20.20	5.60	247.80
PDAC 019	Exosomal Protein	Pancreatic	II	B	20.20	5.60	339.72
PDAC 020	Exosomal Protein	pancreatic	I	A	1122.65	5.60	977.96
PDAC 021	Exosomal Protein	pancreatic	I	B	887.02	5.60	247.80
PDAC 022	Exosomal Protein	Pancreatic	II	B	20.20	21.08	964.96
PDAC 023	Exosomal Protein	Pancreatic	II	B	20.20	5.60	306.76
PDAC 024	Exosomal Protein	Pancreatic	II	B	808.67	5.60	641.67
PDAC 025	Exosomal Protein	Pancreatic	II	B	20.20	5.60	559.24
PDAC 026	Exosomal Protein	Pancreatic	II	B	20.20	5.60	740.89
PDAC 027	Exosomal Protein	Pancreatic	II	B	20.20	6.97	709.25
PDAC 028	Exosomal Protein	Pancreatic	II	B	854.89	5.60	895.77
PDAC 029	Exosomal Protein	pancreatic	I	B	779.49	5.60	331.51
PDAC 030	Exosomal Protein	pancreatic	I	B	20.20	5.60	250.40
PDAC 031	Exosomal Protein	pancreatic	I	B	214.01	5.60	247.80
PDAC 032	Exosomal Protein	pancreatic	I	A	428.69	5.60	601.91
PDAC 033	Exosomal Protein	pancreatic	I	B	339.94	5.60	247.80
PDAC 034	Exosomal Protein	pancreatic	I	B	1051.29	8.74	1038.77
PDAC 035	Exosomal Protein	pancreatic	I	B	185.93	5.60	371.26
PDAC 036	Exosomal Protein	pancreatic	I	B	286.63	5.60	247.80
PDAC 037	Exosomal Protein	pancreatic	I	B	592.37	5.60	247.80
PDAC 038	Exosomal Protein	pancreatic	I	B	1298.18	5.94	1388.07

PDAC 039	Exosomal Protein	pancreatic	I	A	1292.75	5.60	247.80
PDAC 040	Exosomal Protein	pancreatic	I	B	673.97	5.60	247.80
PDAC 041	Exosomal Protein	Pancreatic	I	B	20.20	5.60	825.64
PDAC 042	Exosomal Protein	pancreatic	I	B	1185.51	5.60	319.28
PDAC 043	Exosomal Protein	pancreatic	II	A	1279.57	5.60	247.80
PDAC 044	Exosomal Protein	Pancreatic	II	A	20.20	5.60	247.80
HC 001	Exosomal Protein				20.20	5.60	366.33
HC 002	Exosomal Protein				412.88	5.60	247.80
HC 003	Exosomal Protein				757.43	12.71	1777.33
HC 004	Exosomal Protein				552.75	6.65	814.86
HC 005	Exosomal Protein				743.10	5.60	366.33
HC 006	Exosomal Protein				20.20	5.60	247.80
HC 007	Exosomal Protein				20.20	5.60	322.61
HC 008	Exosomal Protein				20.20	5.60	605.74
HC 009	Exosomal Protein				1833.91	5.60	709.25
HC 010	Exosomal Protein				1475.91	5.60	567.89
HC 011	Exosomal Protein				20.20	6.54	1101.76
HC 012	Exosomal Protein				1216.68	10.93	715.77
HC 013	Exosomal Protein				1040.83	12.00	889.90
HC 014	Exosomal Protein				1027.67	8.44	661.37
HC 015	Exosomal Protein				711.08	5.60	247.80
HC 016	Exosomal Protein				1626.82	5.60	529.35

HC 017	Exosomal Protein				20.20	8.74	2513.21
HC 018	Exosomal Protein				1101.16	5.60	605.74
HC 019	Exosomal Protein				671.65	5.60	247.80
HC 020	Exosomal Protein				1035.98	24.88	3932.25
HC 021	Exosomal Protein				687.27	5.60	449.85
HC 022	Exosomal Protein				781.34	5.60	449.85
HC 023	Exosomal Protein				20.20	5.60	322.61
HC 024	Exosomal Protein				566.80	5.60	366.33
HC 025	Exosomal Protein				985.00	5.60	977.96
HC 026	Exosomal Protein				849.84	5.60	277.22
HC 027	Exosomal Protein				513.45	5.60	306.76
HC 028	Exosomal Protein				20.20	5.60	559.24
HC 029	Exosomal Protein				801.13	5.60	496.83
HC 030	Exosomal Protein				20.20	8.72	910.24
HC 031	Exosomal Protein				20.20	9.95	1029.26
HC 032	Exosomal Protein				20.20	5.60	638.62
HC 033	Exosomal Protein				638.15	5.60	867.94
HC 034	Exosomal Protein				897.62	5.60	735.65
HC 035	Exosomal Protein				947.22	13.65	1884.81
HC 036	Exosomal Protein				446.29	6.86	1061.08
HC 037	Exosomal Protein				680.39	5.60	910.24
HC 038	Exosomal Protein				20.20	18.57	2149.70

HC 039	Exosomal Protein				276.10	5.60	638.62
HC 040	Exosomal Protein				20.20	5.60	440.95
HC 041	Exosomal Protein				707.67	18.57	1829.48
HC 042	Exosomal Protein				20.20	5.60	311.32
HC 043	Exosomal Protein				20.20	5.60	709.25
HC 044	Exosomal Protein				1536.39	5.60	2054.64
HC 045	Exosomal Protein				1534.28	5.60	1553.06
HC 046	Exosomal Protein				2369.98	5.60	1220.41
HC 047	Exosomal Protein				1480.80	5.60	977.96
HC 048	Exosomal Protein				20.20	5.60	709.25
HC 049	Exosomal Protein				20.20	5.60	247.80
HC 050	Exosomal Protein				585.52	5.60	391.24
HC 051	Exosomal Protein				1965.45	12.35	2054.64
HC 052	Exosomal Protein				20.20	5.60	1101.76
HC 053	Exosomal Protein				1462.57	5.60	709.65
HC 054	Exosomal Protein				20.20	6.97	2601.08
HC 055	Exosomal Protein				1593.33	5.60	1334.78
HC 056	Exosomal Protein				20.20	7.31	1168.91
HC 057	Exosomal Protein				656.68	5.63	455.35
HC 058	Exosomal Protein				20.20	17.91	3025.14
HC 059	Exosomal Protein				20.20	5.60	977.96
HC 060	Exosomal Protein				1381.98	18.79	3461.91

HC 061	Exosomal Protein				20.20	5.60	847.76
HC 062	Exosomal Protein				20.20	5.60	709.25
HC 063	Exosomal Protein				20.20	15.11	1278.09
HC 064	Exosomal Protein				20.20	7.04	1094.81
HC 065	Exosomal Protein				700.07	6.10	977.96
HC 066	Exosomal Protein				870.19	5.60	709.25
HC 067	Exosomal Protein				644.77	8.79	972.99
HC 068	Exosomal Protein				1140.77	5.60	709.25
HC 069	Exosomal Protein				785.91	5.60	496.83
HC 070	Exosomal Protein				447.96	5.60	247.80
HC 071	Exosomal Protein				608.64	5.60	366.33
HC 072	Exosomal Protein				528.22	5.60	1038.77
HC 073	Exosomal Protein				20.20	5.60	247.80
HC 074	Exosomal Protein				692.71	5.60	408.67
HC 075	Exosomal Protein				711.08	7.73	567.89
HC 076	Exosomal Protein				854.89	5.60	410.56
HC 077	Exosomal Protein				297.46	5.60	247.80
HC 078	Exosomal Protein				20.20	5.60	247.80
HC 079	Exosomal Protein				378.75	5.60	488.03
HC 080	Exosomal Protein				499.61	5.60	277.22
HC 081	Exosomal Protein				20.20	5.60	247.80
HC 082	Exosomal Protein				1092.83	5.60	642.97

HC 083	Exosomal Protein				376.79	5.60	247.80
HC 084	Exosomal Protein				1628.59	6.48	1388.07
HC 085	Exosomal Protein				1027.67	5.60	605.74
HC 086	Exosomal Protein				881.96	5.60	371.26
HC 087	Exosomal Protein				347.46	5.60	256.02
HC 088	Exosomal Protein				578.26	5.60	247.80
HC 089	Exosomal Protein				20.20	5.60	250.40
HC 090	Exosomal Protein				20.20	5.94	805.20
HC 091	Exosomal Protein				1236.22	5.60	679.63
HC 092	Exosomal Protein				20.20	10.79	1593.23
HC 093	Exosomal Protein				20.20	5.60	247.80
HC 094	Exosomal Protein				20.20	5.60	247.80
HC 095	Exosomal Protein				817.10	5.60	355.73
HC 096	Exosomal Protein				1180.18	15.11	1860.27
HC 097	Exosomal Protein				1627.22	5.60	709.25
HC 098	Exosomal Protein				614.05	5.60	322.61
HC 099	Exosomal Protein				2291.18	8.74	1760.16
HC 100	Exosomal Protein				20.20	5.60	247.80
HC 101	Exosomal Protein				20.20	5.60	322.61
HC 102	Exosomal Protein				737.65	9.51	855.85
HC 103	Exosomal Protein				722.65	5.60	247.80
HC 104	Exosomal Protein				438.15	5.60	247.80

HC 105	Exosomal Protein				20.20	5.60	1101.76
HC 106	Exosomal Protein				2422.03	5.60	1101.76
HC 107	Exosomal Protein				3095.59	5.60	559.24
HC 108	Exosomal Protein				20.20	37.88	4576.75
HC 109	Exosomal Protein				939.94	5.60	277.22
HC 110	Exosomal Protein				355.95	5.60	642.97
HC 111	Exosomal Protein				998.62	5.60	322.61
HC 112	Exosomal Protein				531.81	5.60	490.03
HC 113	Exosomal Protein				20.20	6.24	788.30
OVAR 001	Free Protein	Ovarian	I	A	9510.12	733.82	78647.04
OVAR 002	Free Protein	Ovarian	I	A	8205.87	2098.20	53569.75
OVAR 003	Free Protein	Ovarian	I	B	14483.34	2044.44	107764.02
OVAR 004	Free Protein	Ovarian	I	A	5461.09	1726.04	52041.59
OVAR 005	Free Protein	Ovarian	I	C	16121.68	798.20	85453.25
OVAR 006	Free Protein	Ovarian	I	A	9834.44	717.79	56600.25
OVAR 007	Free Protein	Ovarian	I	A	9665.85	1487.26	72901.05
OVAR 008	Free Protein	Ovarian	II	B	10759.53	1843.12	85048.69
OVAR 009	Free Protein	Ovarian	II	B	15580.58	2068.31	35813.88
OVAR 010	Free Protein	Ovarian	I	A	14307.91	1635.69	43889.09
OVAR 011	Free Protein	Ovarian	I	A	10116.63	1966.18	40741.02
OVAR 012	Free Protein	Ovarian	I	B	9721.85	957.67	112640.82
OVAR 013	Free Protein	Ovarian	I	A	3480.07	1890.24	80787.55
OVAR 014	Free Protein	Ovarian	I	B	11122.99	1459.25	149507.14
OVAR 015	Free Protein	Ovarian	I	B	19717.57	1078.32	41617.73
OVAR 016	Free Protein	Ovarian	I	A	20.20	1226.43	57091.94
OVAR 017	Free Protein	Ovarian	I	A	20.20	5.60	247.80

OVAR 018	Free Protein	Ovarian	I	A	5891.62	650.82	48730.97
OVAR 019	Free Protein	Ovarian	I	C	12094.09	1768.85	54221.95
OVAR 020	Free Protein	Ovarian	I	B	10817.10	1766.91	92803.52
OVAR 021	Free Protein	Ovarian	I	A	4951.46	728.47	51219.12
OVAR 022	Free Protein	Ovarian	I	A	8600.58	1328.02	62148.70
OVAR 023	Free Protein	Ovarian	II	A	32187.40	2471.81	1000320.26
OVAR 024	Free Protein	Ovarian	I	A	6143.91	1884.34	66409.64
OVAR 025	Free Protein	Ovarian	I	C	1992.07	1041.51	62042.87
OVAR 026	Free Protein	Ovarian	I	C	8572.13	1458.68	39823.54
OVAR 027	Free Protein	Ovarian	I	A	10264.54	1494.90	134295.27
OVAR 028	Free Protein	Ovarian	I	B	8812.50	374.04	47956.05
OVAR 029	Free Protein	Ovarian	I	A	12267.91	1389.42	77048.30
OVAR 030	Free Protein	Ovarian	I	B	12392.13	1809.38	110045.51
OVAR 031	Free Protein	Ovarian	I	#N/A	9836.16	1028.24	61402.26
OVAR 032	Free Protein	Ovarian	I	A	16071.09	757.43	37215.20
OVAR 033	Free Protein	Ovarian	I	A	10584.29	1782.17	59534.18
OVAR 034	Free Protein	Ovarian	I	A	13548.99	1836.60	39759.29
OVAR 035	Free Protein	Ovarian	I	A	16573.79	2886.65	68878.89
OVAR 036	Free Protein	Ovarian	I	A	34971.78	1362.03	62180.24
OVAR 037	Free Protein	Ovarian	II	A	9580.06	1272.12	36684.56
OVAR 038	Free Protein	Ovarian	I	A	9154.64	485.93	41271.97
OVAR 039	Free Protein	Ovarian	I	A	10139.77	1149.55	36298.04
OVAR 040	Free Protein	Ovarian	I	A	14099.43	2768.81	56976.80
OVAR 041	Free Protein	Ovarian	I	B	6540.74	462.48	45793.43
OVAR 042	Free Protein	Ovarian	I	A	7292.36	2022.93	75767.20
OVAR 043	Free Protein	Ovarian	II	A	9156.31	1395.41	76195.13
OVAR 044	Free Protein	Ovarian	I	#N/A	8041.98	1405.09	52232.79
BLDR 001	Free Protein	Bladder	II		12819.34	2359.31	70693.89
BLDR 002	Free Protein	Bladder	I		9670.57	857.72	102523.35

BLDR 003	Free Protein	Bladder	I		9892.45	1086.90	33430.88
BLDR 004	Free Protein	Bladder	I		18279.84	811.04	61356.47
BLDR 005	Free Protein	Bladder	II		16090.64	1134.78	54131.06
BLDR 006	Free Protein	Bladder	I		12112.23	638.77	90920.07
BLDR 007	Free Protein	Bladder	I		19747.75	1019.49	74497.44
BLDR 008	Free Protein	Bladder	II		7926.95	1327.18	60459.29
BLDR 009	Free Protein	Bladder	I		10099.04	523.34	45546.13
BLDR 010	Free Protein	Bladder	II		17064.98	2655.77	41095.46
BLDR 011	Free Protein	Bladder	II		10456.64	1108.97	52230.47
BLDR 012	Free Protein	Bladder	II		8016.51	1325.15	68344.30
BLDR 013	Free Protein	Bladder	I		12084.87	1855.78	57522.59
BLDR 014	Free Protein	Bladder	I		2538.87	1002.67	67606.57
BLDR 015	Free Protein	Bladder	I		10692.41	2541.45	98314.17
BLDR 016	Free Protein	Bladder	I		17063.28	1286.65	62360.27
BLDR 017	Free Protein	Bladder	II		6732.49	1302.80	99282.04
BLDR 018	Free Protein	Bladder	I		15219.45	1934.25	106373.75
BLDR 019	Free Protein	Bladder	II		11921.69	2299.04	76303.36
BLDR 020	Free Protein	Bladder	II		6842.19	1790.65	69961.56
BLDR 021	Free Protein	Bladder	I		13153.52	730.74	52150.72
BLDR 022	Free Protein	Bladder	I		7988.40	1099.93	106471.38
BLDR 023	Free Protein	Bladder	I		8566.60	1466.80	130602.70
BLDR 024	Free Protein	Bladder	I		15369.74	1512.20	104378.24
BLDR 025	Free Protein	Bladder	I		14007.30	1923.61	43151.73
BLDR 026	Free Protein	Bladder	II		9939.78	1449.48	33405.56
BLDR 027	Free Protein	Bladder	I		12113.41	1640.81	101897.04
BLDR 028	Free Protein	Bladder	I		13288.46	2325.33	83732.42
BLDR 029	Free Protein	Bladder	II		13805.56	1286.56	134992.84
BLDR 030	Free Protein	Bladder	II		8545.49	1144.48	105567.88
BLDR 031	Free Protein	Bladder	II		16529.10	2178.42	107374.38

BLDR 032	Free Protein	Bladder	II		12010.43	1949.35	67559.03
BLDR 033	Free Protein	Bladder	I		10896.77	1192.86	60896.40
BLDR 034	Free Protein	Bladder	II		8310.44	739.84	51342.30
BLDR 035	Free Protein	Bladder	II		17363.90	2453.42	174926.86
BLDR 036	Free Protein	Bladder	I		11729.96	2162.77	81306.18
BLDR 037	Free Protein	Bladder	II		11067.93	375.17	39927.05
BLDR 038	Free Protein	Bladder	II		9519.56	2612.65	76662.84
BLDR 039	Free Protein	Bladder	I		6369.52	1417.74	110554.90
BLDR 040	Free Protein	Bladder	I		10615.98	900.69	45687.95
BLDR 041	Free Protein	Bladder	II		11663.75	1716.98	73497.90
BLDR 042	Free Protein	Bladder	II		6928.13	2159.00	57813.52
BLDR 043	Free Protein	Bladder	I		11573.22	1979.94	59235.27
BLDR 044	Free Protein	Bladder	I		9255.10	2185.63	101173.81
BLDR 045	Free Protein	Bladder	II		10412.43	1489.16	70472.12
BLDR 046	Free Protein	Bladder	I		3902.82	981.61	69056.36
BLDR 047	Free Protein	Bladder	I		15309.59	368.01	82870.39
BLDR 048	Free Protein	Bladder	I		14314.18	1068.43	103568.72
PDAC 001	Free Protein	Pancreatic	I	A	7912.80	581.80	68132.54
PDAC 002	Free Protein	Pancreatic	II	B	9640.42	1264.15	116191.04
PDAC 003	Free Protein	Pancreatic	II	A	12713.00	1148.58	73828.58
PDAC 004	Free Protein	pancreatic	II	A	18951.54	2108.18	28356.13
PDAC 005	Free Protein	Pancreatic	II	A	7944.29	848.56	107664.72
PDAC 006	Free Protein	Pancreatic	II	B	10286.87	1675.61	70004.29
PDAC 007	Free Protein	Pancreatic	II	A	11599.03	1594.56	39065.21
PDAC 008	Free Protein	Pancreatic	II	B	10724.36	1784.46	59653.02
PDAC 009	Free Protein	Pancreatic	II	B	7212.18	336.53	35634.38
PDAC 010	Free Protein	pancreatic	I	B	17949.92	2727.49	113875.30
PDAC 011	Free Protein	Pancreatic	II	B	19339.11	2525.03	132217.61
PDAC 012	Free Protein	pancreatic	I	B	11438.55	1354.42	40462.42

PDAC 013	Free Protein	pancreatic	I	B	8101.82	1407.39	58959.40
PDAC 014	Free Protein	pancreatic	II	A	9684.93	1533.14	60876.61
PDAC 015	Free Protein	Pancreatic	II	B	10849.08	1847.04	108061.89
PDAC 016	Free Protein	pancreatic	I	B	8929.64	1714.39	89085.41
PDAC 017	Free Protein	Pancreatic	II	B	8989.82	1731.87	51164.19
PDAC 018	Free Protein	Pancreatic	II	B	12078.00	2459.55	40578.31
PDAC 019	Free Protein	Pancreatic	II	B	15534.74	1215.54	70730.12
PDAC 020	Free Protein	pancreatic	I	A	11512.35	2927.71	128508.39
PDAC 021	Free Protein	pancreatic	I	B	13923.99	1782.51	73210.41
PDAC 022	Free Protein	Pancreatic	II	B	11660.04	2246.56	74857.25
PDAC 023	Free Protein	Pancreatic	II	B	11708.22	583.55	54330.50
PDAC 024	Free Protein	Pancreatic	II	B	11663.25	2365.88	157913.53
PDAC 025	Free Protein	Pancreatic	II	B	14066.93	1396.02	43336.35
PDAC 026	Free Protein	Pancreatic	II	B	19235.45	2012.68	115695.92
PDAC 027	Free Protein	Pancreatic	II	B	3814.48	1718.27	45264.89
PDAC 028	Free Protein	Pancreatic	II	B	11727.50	1290.41	102195.82
PDAC 029	Free Protein	pancreatic	I	B	10548.29	1251.81	38201.23
PDAC 030	Free Protein	pancreatic	I	B	13735.06	2223.12	73096.07
PDAC 031	Free Protein	pancreatic	I	B	8995.24	1073.98	32748.55
PDAC 032	Free Protein	pancreatic	I	A	9412.70	1376.32	49551.17
PDAC 033	Free Protein	pancreatic	I	B	13632.63	1425.28	53437.20
PDAC 034	Free Protein	pancreatic	I	B	8193.01	1278.76	66630.84
PDAC 035	Free Protein	pancreatic	I	B	4931.79	2030.21	69861.10
PDAC 036	Free Protein	pancreatic	I	B	3311.89	1478.14	52473.14
PDAC 037	Free Protein	pancreatic	I	B	20177.04	4564.67	92716.26
PDAC 038	Free Protein	pancreatic	I	B	9922.17	1459.25	127061.61
PDAC 039	Free Protein	pancreatic	I	A	9770.39	598.32	70563.78
PDAC 040	Free Protein	pancreatic	I	B	8156.89	829.24	34485.30
PDAC 041	Free Protein	Pancreatic	I	B	12165.21	2419.85	114683.92

PDAC 042	Free Protein	pancreatic	I	B	17255.67	2049.07	83363.45
PDAC 043	Free Protein	pancreatic	II	A	8946.90	346.51	49223.56
PDAC 044	Free Protein	Pancreatic	II	A	10835.68	2609.45	56091.68
HC 001	Free Protein				11374.06	1784.89	71265.12
HC 002	Free Protein				11982.08	1892.70	74455.38
HC 003	Free Protein				8995.24	911.71	97408.83
HC 004	Free Protein				11466.02	756.23	93378.41
HC 005	Free Protein				8202.04	1421.51	60896.40
HC 006	Free Protein				10719.69	2298.15	79884.73
HC 007	Free Protein				13125.58	1752.28	75149.98
HC 008	Free Protein				11165.82	656.26	94723.82
HC 009	Free Protein				13885.40	959.51	62443.67
HC 010	Free Protein				11208.67	659.89	92608.68
HC 011	Free Protein				14489.92	893.35	61413.15
HC 012	Free Protein				8971.07	1376.32	46134.26
HC 013	Free Protein				8235.15	1715.89	56881.72
HC 014	Free Protein				9467.22	1706.33	53009.31
HC 015	Free Protein				8313.45	1629.98	54821.68
HC 016	Free Protein				11880.56	847.54	97983.25
HC 017	Free Protein				10829.58	754.41	94051.37
HC 018	Free Protein				11760.68	919.05	102377.37
HC 019	Free Protein				12031.33	1161.21	99800.24
HC 020	Free Protein				11591.79	1096.22	105234.88
HC 021	Free Protein				7363.64	1077.69	57249.48
HC 022	Free Protein				7183.72	1245.10	56513.38
HC 023	Free Protein				8482.18	1455.47	67238.87
HC 024	Free Protein				8862.33	1263.79	58766.91
HC 025	Free Protein				9776.46	1198.45	83309.55
HC 026	Free Protein				13907.27	2037.98	92897.41

HC 027	Free Protein			#N/A	12388.90	3034.95	94435.69
HC 028	Free Protein				12432.12	2973.96	95827.49
HC 029	Free Protein				9539.93	1756.11	101518.93
HC 030	Free Protein				8543.81	1851.40	77232.64
HC 031	Free Protein				10115.27	3897.47	112119.50
HC 032	Free Protein				9375.96	1515.09	87549.15
HC 033	Free Protein				8431.19	747.85	92666.18
HC 034	Free Protein				10810.02	1033.59	97699.51
HC 035	Free Protein				10088.45	1263.48	80996.76
HC 036	Free Protein				8188.90	721.35	90909.15
HC 037	Free Protein				1362.26	18.80	7062.58
HC 038	Free Protein				10331.01	1789.01	90531.41
HC 039	Free Protein				8287.25	862.65	93619.73
HC 040	Free Protein				13742.47	1745.55	120792.37
HC 041	Free Protein				8660.72	2433.30	110369.01
HC 042	Free Protein				11937.04	2857.68	127688.26
HC 043	Free Protein				11377.12	2018.55	78360.90
HC 044	Free Protein				7303.65	674.40	104235.41
HC 045	Free Protein				7264.67	721.64	106661.53
HC 046	Free Protein				9455.10	1077.69	83992.04
HC 047	Free Protein				13459.99	2005.55	109278.43
HC 048	Free Protein				13135.70	1988.19	110062.97
HC 049	Free Protein				14727.12	1489.55	126385.11
HC 050	Free Protein				20668.35	2534.90	49837.19
HC 051	Free Protein				21307.89	2439.71	50531.41
HC 052	Free Protein				14485.11	1286.52	116042.49
HC 053	Free Protein				19429.46	1096.76	162202.71
HC 054	Free Protein				29377.22	1450.58	217940.88
HC 055	Free Protein				8483.54	659.92	80974.18

HC 056	Free Protein				7994.89	433.38	63255.72
HC 057	Free Protein				13881.77	2638.21	77164.78
HC 058	Free Protein				16604.30	2207.24	83749.05
HC 059	Free Protein				17267.61	2748.30	105011.37
HC 060	Free Protein				11111.57	1008.50	113120.30
HC 061	Free Protein				15251.77	1304.58	145766.28
HC 062	Free Protein				23689.89	7807.86	127221.66
HC 063	Free Protein				23285.33	7739.19	128338.13
HC 064	Free Protein				6455.45	855.78	73519.59
HC 065	Free Protein				22717.06	5106.94	122728.07
HC 066	Free Protein				18627.27	3380.42	137113.59
HC 067	Free Protein				13058.73	1266.03	91197.40
HC 068	Free Protein				19933.93	4486.96	97839.49
HC 069	Free Protein				24318.99	1218.69	222561.25
HC 070	Free Protein				17450.85	4889.28	88807.09
HC 071	Free Protein				17869.96	2951.15	88768.43
HC 072	Free Protein				16378.61	4153.98	79049.04
HC 073	Free Protein				16766.86	2525.80	71398.59
HC 074	Free Protein				16192.78	2546.28	69939.22
HC 075	Free Protein				16719.27	2745.99	73280.97
HC 076	Free Protein				6620.24	4083.08	104503.41
HC 077	Free Protein				14781.83	2934.71	109396.08
HC 078	Free Protein				15699.80	3024.17	110180.69
HC 079	Free Protein				6912.64	4689.67	112183.78
HC 080	Free Protein				14064.67	2541.72	99084.12
HC 081	Free Protein			#N/A	7152.65	4857.63	120112.28
HC 082	Free Protein				12704.77	1750.37	130974.66
HC 083	Free Protein			#N/A	20100.02	2709.02	100174.06
HC 084	Free Protein				11855.72	1710.24	139733.40

HC 085	Free Protein				12000.56	1983.86	133818.69
HC 086	Free Protein				14891.33	2649.18	171061.29
HC 087	Free Protein				12336.77	1206.78	136872.12
HC 088	Free Protein				15126.28	2507.62	73473.10
HC 089	Free Protein				19489.15	2580.49	95896.86
HC 090	Free Protein				19537.61	2460.04	91128.30
HC 091	Free Protein				13166.54	1979.52	133337.43
HC 092	Free Protein				20014.93	2857.50	97139.85
HC 093	Free Protein				14711.49	3443.48	84366.15
HC 094	Free Protein				14165.76	4726.29	88072.66
HC 095	Free Protein				13181.52	2602.80	67391.33
HC 096	Free Protein				14200.77	4847.09	91941.45
HC 097	Free Protein				14867.86	4012.46	79510.94
HC 098	Free Protein				12345.80	1851.87	78046.77
HC 099	Free Protein				11497.99	1273.11	75315.24
HC 100	Free Protein				8576.36	1246.31	74765.28
HC 101	Free Protein				8933.18	1242.49	59740.78
HC 102	Free Protein				9089.91	1328.77	60991.62
HC 103	Free Protein				9611.32	1700.21	69310.72
HC 104	Free Protein				13088.27	1700.21	66783.66
HC 105	Free Protein				18643.14	1189.04	94702.96
HC 106	Free Protein				16587.23	1118.69	87318.14
HC 107	Free Protein				15845.94	887.18	69869.51
HC 108	Free Protein				16817.79	2085.94	119895.17
HC 109	Free Protein				9177.75	1296.12	79958.14
HC 110	Free Protein				16985.22	1925.86	119468.49
HC 111	Free Protein				9227.96	1255.88	76275.70
HC 112	Free Protein				17881.28	2037.77	123814.45
HC 113	Free Protein				18001.04	1280.47	133344.58

Subject Cohort ID	sHGFR/c-Met	sHer2	sHer3	sIL-6Ra	sNeuropilin-1	sPECAM-1	sVEGFR1
OVAR 001	426.44	247.02	43.30	297.27	3479.92	78.82	11.51
OVAR 002	479.15	965.97	17.90	364.22	2017.59	1025.42	9.50
OVAR 003	701.38	1588.43	37.94	139.27	1388.99	1636.11	5.10
OVAR 004	88.26	168.41	17.90	58.87	151.00	15.50	5.10
OVAR 005	507.81	900.51	105.46	343.20	6281.80	363.32	6.53
OVAR 006	335.58	592.18	17.90	116.74	3267.60	725.84	5.10
OVAR 007	329.90	1001.79	17.90	372.05	3727.17	1337.68	5.10
OVAR 008	192.58	246.70	34.70	78.97	1131.09	228.35	5.95
OVAR 009	329.90	11.90	17.90	133.78	5703.26	469.90	5.10
OVAR 010	335.58	11.90	17.90	32.47	151.00	293.28	5.10
OVAR 011	164.69	368.60	17.90	317.99	729.70	117.12	5.10
OVAR 012	257.27	11.90	17.90	593.89	2761.19	142.25	5.10
OVAR 013	1327.93	11.90	17.90	15.10	11111.24	15.50	5.97
OVAR 014	398.90	651.28	17.90	411.22	5152.80	15.50	5.10
OVAR 015	439.01	11.90	17.90	315.44	4611.10	526.17	9.51
OVAR 016	336.27	875.66	17.90	262.41	1655.76	15.50	5.10
OVAR 017	348.14	11.90	17.90	389.09	5290.46	15.50	9.30
OVAR 018	218.59	347.81	17.90	111.99	1170.86	94.02	5.10
OVAR 019	322.45	421.82	70.34	170.81	6930.85	94.02	5.10
OVAR 020	175.97	903.67	17.90	57.53	151.00	364.47	5.10
OVAR 021	815.09	11.90	45.34	517.93	8355.69	15.50	5.10
OVAR 022	24.20	11.90	17.90	15.10	2895.12	15.50	5.10
OVAR 023	1354.12	683.31	17.90	681.25	52622.19	15.50	9.30
OVAR 024	788.37	661.27	17.90	304.13	4995.51	799.66	6.20
OVAR 025	1068.01	936.45	36.89	281.47	3148.43	620.55	5.10
OVAR 026	1250.56	601.54	17.90	851.33	14697.12	591.50	5.10
OVAR 027	550.44	11.90	46.57	377.02	7746.54	355.89	17.23

OVAR 028	136.40	515.42	161.77	50.92	151.00	121.50	7.64
OVAR 029	115.22	220.54	17.90	84.52	463.00	94.85	5.10
OVAR 030	273.98	470.62	136.65	183.25	299.42	225.73	17.23
OVAR 031	836.09	394.15	39.95	348.61	7613.55	251.61	5.10
OVAR 032	187.56	251.16	17.90	144.27	319.73	146.29	5.10
OVAR 033	201.33	70.76	49.75	80.88	1104.03	43.93	5.10
OVAR 034	242.71	11.90	38.31	264.29	2075.02	44.64	7.23
OVAR 035	887.86	301.76	209.10	15.10	19178.63	101.97	25.61
OVAR 036	510.30	11.90	77.02	407.86	9953.16	1231.25	9.32
OVAR 037	226.42	11.90	17.90	115.74	3325.95	642.66	5.10
OVAR 038	135.80	1022.69	17.90	43.60	151.00	1183.59	5.10
OVAR 039	81.94	288.86	17.90	43.13	151.00	193.79	5.10
OVAR 040	475.41	844.66	83.06	205.64	5627.66	745.12	5.10
OVAR 041	87.57	483.66	44.29	78.45	151.00	634.12	5.10
OVAR 042	632.35	1121.83	61.86	69.88	151.00	1209.57	9.51
OVAR 043	94.53	11.90	17.90	52.76	151.00	962.02	13.04
OVAR 044	244.65	601.53	17.90	136.72	322.68	776.47	14.81
BLDR 001	758.88	423.79	93.52	883.72	29523.38	188.96	10.14
BLDR 002	360.92	1106.44	17.90	123.30	896.45	572.58	5.55
BLDR 003	275.66	165.54	17.90	175.04	1873.49	79.38	5.10
BLDR 004	173.81	11.90	75.31	87.13	151.00	48.66	5.10
BLDR 005	861.95	11.90	136.65	1189.32	26759.18	427.56	15.43
BLDR 006	651.57	278.63	17.90	433.28	10330.17	123.68	10.17
BLDR 007	226.77	1059.99	17.90	142.22	2484.91	1293.09	5.10
BLDR 008	756.64	11.90	17.90	15.10	2157.50	15.50	26.02
BLDR 009	252.74	416.37	17.90	15.10	151.00	50.93	5.10
BLDR 010	268.29	203.33	17.90	112.77	151.00	115.67	5.10
BLDR 011	302.70	529.39	78.74	234.29	2781.82	425.26	5.53
BLDR 012	3487.33	11.90	17.90	3302.70	43680.78	15.50	10.85

BLDR 013	1418.60	538.72	17.90	817.91	12606.79	276.74	5.10
BLDR 014	1320.25	11.90	28.99	210.16	2304.12	692.59	5.10
BLDR 015	211.67	822.01	124.20	261.06	1143.62	289.85	14.53
BLDR 016	394.90	350.33	75.18	65.73	151.00	252.85	5.10
BLDR 017	702.67	709.64	70.62	479.09	4085.62	197.79	11.65
BLDR 018	465.37	575.15	129.53	389.62	5909.99	212.92	20.91
BLDR 019	658.36	882.91	17.90	366.50	5599.96	304.04	7.77
BLDR 020	168.14	11.90	17.90	330.02	1209.19	900.74	5.10
BLDR 021	113.29	1061.47	84.78	98.70	151.00	575.32	11.89
BLDR 022	479.67	400.66	17.90	386.53	1754.58	169.01	5.10
BLDR 023	485.69	538.57	28.99	186.74	2719.24	78.12	5.10
BLDR 024	730.97	819.85	31.60	129.28	1500.32	102.05	5.10
BLDR 025	324.42	11.90	17.90	130.49	1796.91	853.00	5.10
BLDR 026	455.71	320.16	17.90	390.09	5389.80	311.68	10.85
BLDR 027	639.58	11.90	43.58	131.94	3375.82	621.58	5.34
BLDR 028	566.85	815.66	65.15	244.45	9722.25	895.48	9.31
BLDR 029	33.59	356.66	17.90	23.58	151.00	135.74	5.10
BLDR 030	347.87	711.08	53.77	169.51	1756.66	884.17	8.50
BLDR 031	428.63	259.81	17.90	344.68	2031.27	15.50	15.57
BLDR 032	865.62	357.54	17.90	324.90	9645.58	123.98	6.18
BLDR 033	171.60	11.90	17.90	167.19	153.68	233.40	5.10
BLDR 034	199.64	11.90	17.90	99.79	1313.83	75.37	5.10
BLDR 035	975.64	11.90	17.90	466.30	7422.35	760.66	19.55
BLDR 036	387.81	1159.80	36.89	221.55	5105.60	2018.97	10.36
BLDR 037	531.52	472.57	32.46	286.22	5381.79	241.86	5.10
BLDR 038	193.63	427.37	37.63	200.31	3459.00	698.94	5.10
BLDR 039	309.17	11.90	17.90	196.75	2557.74	15.50	8.94
BLDR 040	234.17	850.82	17.90	87.49	1017.98	624.73	5.10
BLDR 041	502.39	11.90	22.24	444.80	3992.76	1450.57	30.70

BLDR 042	159.90	1102.94	22.24	85.12	151.00	907.18	8.92
BLDR 043	678.99	1249.29	65.48	754.70	8249.27	1687.19	24.81
BLDR 044	217.64	11.90	17.90	238.42	460.61	522.84	60.80
BLDR 045	738.97	1004.79	64.88	127.15	151.00	930.86	29.52
BLDR 046	490.30	340.81	136.65	392.23	5989.05	51.70	6.82
BLDR 047	381.49	11.90	23.68	94.70	3948.67	53.37	5.10
BLDR 048	483.44	11.90	17.90	29.57	151.00	55.89	5.10
PDAC 001	129.44	242.76	97.81	118.11	641.06	19.31	5.10
PDAC 002	555.47	244.92	129.53	503.54	15611.35	59.86	11.03
PDAC 003	127.13	140.37	44.91	99.04	151.00	41.64	6.82
PDAC 004	154.38	11.90	17.90	100.52	1298.09	245.27	5.10
PDAC 005	337.11	341.93	17.90	301.12	3456.17	25.96	5.22
PDAC 006	362.00	628.70	98.37	155.69	3211.78	480.40	5.69
PDAC 007	312.59	1226.06	43.63	134.83	1655.76	439.98	5.10
PDAC 008	387.17	801.20	88.60	227.64	3136.76	679.67	5.10
PDAC 009	435.63	855.47	17.90	245.92	3577.98	139.23	5.10
PDAC 010	591.24	310.40	67.43	317.42	6431.23	147.04	5.10
PDAC 011	612.74	1007.25	42.82	146.74	3645.29	1232.43	5.10
PDAC 012	580.19	11.90	17.90	155.25	4063.28	317.63	5.10
PDAC 013	802.56	11.90	118.89	521.44	11499.19	145.78	7.23
PDAC 014	134.04	149.89	17.90	34.57	485.21	72.71	5.10
PDAC 015	1234.41	598.62	17.90	339.45	16308.57	307.69	5.10
PDAC 016	244.15	924.59	17.90	96.12	603.86	1194.33	10.50
PDAC 017	171.87	93.33	17.90	64.34	3431.76	29.96	5.10
PDAC 018	242.12	508.50	75.15	96.52	1897.73	212.76	5.10
PDAC 019	535.97	332.72	31.93	252.90	5094.95	91.56	5.10
PDAC 020	356.68	456.59	70.17	157.96	2355.03	184.14	5.10
PDAC 021	234.17	11.90	17.90	64.73	151.00	641.52	5.10
PDAC 022	2294.11	1235.66	81.26	926.89	23634.93	219.68	8.26

PDAC 023	540.00	1391.88	18.86	287.50	4195.29	1195.57	5.10
PDAC 024	416.95	367.28	141.14	77.63	2030.28	108.50	5.10
PDAC 025	400.94	575.15	136.65	401.15	6668.69	117.13	5.10
PDAC 026	24.20	310.37	17.90	100.33	3243.49	15.50	5.10
PDAC 027	510.30	11.90	49.90	530.99	4376.62	196.74	5.22
PDAC 028	1110.61	1199.06	17.90	647.57	11919.98	1324.68	6.40
PDAC 029	763.11	175.61	29.69	279.20	13173.13	125.87	6.85
PDAC 030	463.59	11.90	17.90	258.28	7666.32	356.49	7.77
PDAC 031	364.18	390.37	17.90	236.78	10871.61	246.98	5.10
PDAC 032	396.96	413.15	32.46	650.75	1183.12	244.42	5.10
PDAC 033	110.83	305.20	17.90	78.03	151.00	66.15	5.10
PDAC 034	1168.62	365.39	29.14	879.71	42449.70	238.47	8.23
PDAC 035	135.72	1075.42	17.90	123.72	331.86	343.41	5.10
PDAC 036	178.56	806.28	17.90	126.22	2636.60	321.28	5.10
PDAC 037	253.12	520.81	17.90	129.21	3293.16	390.87	13.72
PDAC 038	580.19	804.47	39.20	556.45	11771.83	838.98	5.10
PDAC 039	189.06	203.33	17.90	65.94	632.84	222.50	5.10
PDAC 040	154.38	267.28	28.59	78.03	331.86	146.03	5.10
PDAC 041	305.19	11.90	17.90	136.72	1973.70	573.07	10.69
PDAC 042	339.34	294.30	44.68	177.77	1799.85	111.64	5.71
PDAC 043	483.44	482.58	17.90	119.97	2278.75	215.03	5.10
PDAC 044	141.05	11.90	17.90	42.43	151.00	18.37	5.10
HC 001	378.35	619.98	86.76	310.48	2521.45	447.26	15.57
HC 002	175.75	739.91	22.90	135.62	1014.83	526.47	5.10
HC 003	1251.43	1746.40	43.30	926.82	15239.92	1739.30	12.52
HC 004	588.50	1024.34	62.45	299.59	4015.21	542.51	6.20
HC 005	209.87	902.23	34.14	116.05	151.00	1350.48	12.52
HC 006	1367.77	11.90	26.99	715.89	15627.30	15.50	22.80
HC 007	175.75	698.39	22.17	97.22	151.00	1530.46	8.50
HC 008	439.59	877.33	17.90	184.32	1336.50	2242.56	11.51
HC 009	500.29	11.90	199.94	128.58	1320.06	2235.69	15.43
HC 010	625.37	1422.83	21.43	227.41	1746.32	1330.60	11.51
HC 011	540.39	11.90	17.90	15.10	3845.23	15.50	17.23

HC 012	634.29	1239.34	58.08	492.57	7849.26	1783.34	17.11
HC 013	789.08	1059.48	55.73	552.80	9961.47	804.44	10.50
HC 014	490.16	1862.04	68.34	344.38	5770.97	2482.95	16.59
HC 015	133.34	1309.70	17.90	89.52	391.91	1623.54	6.53
HC 016	419.86	943.54	25.13	170.08	1632.35	453.32	8.50
HC 017	887.86	681.05	170.81	767.71	16068.20	251.61	17.23
HC 018	448.37	802.90	17.90	217.60	2079.13	159.68	5.55
HC 019	120.68	519.68	17.90	36.89	438.02	111.51	5.10
HC 020	2280.42	564.69	52.60	1550.21	55227.09	377.49	7.51
HC 021	363.10	1589.33	17.90	206.67	1479.66	1505.99	8.01
HC 022	291.53	934.93	17.90	168.94	714.69	1324.77	12.52
HC 023	214.14	553.00	17.90	128.33	197.42	1196.57	15.06
HC 024	261.35	1095.99	18.86	142.36	457.11	2171.43	12.52
HC 025	346.89	11.90	272.06	218.70	3069.10	822.88	10.17
HC 026	248.45	865.33	211.00	167.81	1000.54	901.61	11.51
HC 027	253.70	1224.46	17.90	86.08	275.70	603.07	5.19
HC 028	136.40	11.90	35.04	82.53	151.00	397.14	5.10
HC 029	397.75	471.04	76.51	190.43	3303.29	148.22	9.30
HC 030	552.39	11.90	17.90	678.38	3966.90	15.50	25.99
HC 031	237.90	11.90	17.90	161.62	151.00	1760.69	31.87
HC 032	659.00	11.90	17.90	53.71	151.00	539.52	8.33
HC 033	321.95	1552.19	17.90	280.81	399.20	2346.77	19.52
HC 034	285.04	11.90	17.90	232.65	844.63	1501.93	5.97
HC 035	572.38	11.90	83.56	283.65	5397.37	2395.88	97.64
HC 036	465.69	1282.24	27.16	404.29	729.98	1812.66	19.52
HC 037	452.36	1286.26	22.24	281.72	1702.07	1687.19	9.51
HC 038	579.04	11.90	62.46	359.80	8458.15	1391.68	119.18
HC 039	204.10	846.98	17.90	114.24	151.00	869.18	23.63
HC 040	434.34	11.90	17.90	199.27	857.28	2418.59	5.10
HC 041	432.34	656.33	168.55	320.26	1286.01	1464.90	68.50
HC 042	24.20	11.90	17.90	15.10	455.87	15.50	5.10
HC 043	470.35	11.90	30.17	157.27	545.71	181.86	5.10
HC 044	550.44	1140.52	156.37	601.78	5082.10	308.01	12.33
HC 045	415.75	555.94	133.09	477.36	4306.47	79.62	9.32
HC 046	950.24	801.83	158.17	203.89	6559.74	61.92	18.60
HC 047	746.02	11.90	106.56	133.33	3650.45	33.73	9.32
HC 048	605.93	540.40	133.09	87.13	1884.21	49.67	14.09
HC 049	124.03	234.62	17.90	37.96	151.00	22.61	5.10
HC 050	104.12	83.57	75.31	62.40	151.00	22.14	5.61
HC 051	717.86	251.40	17.90	684.02	21529.63	188.71	11.89
HC 052	510.30	770.44	28.56	434.79	1483.01	150.25	11.89
HC 053	679.50	696.67	213.31	135.96	2039.16	242.85	5.10
HC 054	535.37	872.76	223.81	449.81	8670.65	304.37	12.77
HC 055	435.56	684.75	176.25	294.59	6342.42	201.35	6.82

HC 056	1114.99	903.40	17.90	597.93	12240.17	211.48	5.10
HC 057	259.67	484.40	101.57	214.90	1261.64	404.84	7.03
HC 058	1165.48	11.90	113.59	1860.89	34042.76	1695.07	11.03
HC 059	298.17	11.90	17.90	385.54	3255.49	1395.54	10.17
HC 060	2019.69	591.94	53.95	1295.94	35651.96	304.67	5.10
HC 061	332.23	364.52	158.17	181.16	258.12	136.90	25.61
HC 062	320.04	11.90	106.56	156.59	2191.03	286.24	18.15
HC 063	475.33	564.33	54.92	420.55	10237.62	226.90	19.06
HC 064	985.82	509.24	17.90	485.60	15066.22	804.86	5.10
HC 065	245.11	567.94	75.31	231.45	6675.96	163.71	8.48
HC 066	298.17	467.11	101.30	147.66	1707.28	121.50	5.22
HC 067	820.16	570.18	30.24	359.68	18277.46	869.19	6.18
HC 068	235.53	193.86	203.60	155.90	1170.76	61.92	10.17
HC 069	417.67	622.66	17.90	156.66	1436.66	218.32	5.10
HC 070	57.34	94.37	17.90	44.00	151.00	58.42	5.10
HC 071	422.05	385.23	17.90	395.43	5259.06	174.57	5.10
HC 072	352.70	11.90	17.90	335.77	4392.24	75.37	5.10
HC 073	199.19	1030.84	22.17	138.99	986.24	162.64	6.53
HC 074	417.68	1433.47	65.96	390.07	3701.99	658.93	6.53
HC 075	701.38	1461.88	97.30	705.72	7713.70	1045.81	7.51
HC 076	114.11	11.90	17.90	87.50	755.24	496.51	6.62
HC 077	422.05	1408.65	17.90	88.98	151.00	455.92	9.50
HC 078	479.15	1322.04	17.90	153.36	418.86	462.88	9.50
HC 079	97.85	171.28	17.90	70.56	1695.68	64.85	5.10
HC 080	532.11	907.39	17.90	157.04	1388.99	265.29	14.55
HC 081	24.20	11.90	17.90	15.10	151.00	15.50	5.10
HC 082	510.01	1035.18	17.90	289.66	1014.83	430.89	7.51
HC 083	144.16	23.66	17.90	75.68	3007.03	15.50	5.10
HC 084	882.74	1086.82	59.96	501.91	27528.77	969.14	5.10
HC 085	380.53	1097.73	17.90	155.90	2761.79	359.99	5.10
HC 086	168.14	11.90	17.90	152.93	151.00	182.56	5.10
HC 087	330.35	489.52	17.90	82.77	151.00	89.10	5.10
HC 088	141.80	146.25	30.36	125.53	532.80	57.86	5.10
HC 089	463.59	11.90	41.46	85.36	1131.09	274.70	5.10
HC 090	818.37	11.90	70.61	421.33	12486.35	414.05	5.95
HC 091	470.34	1152.66	21.43	331.98	2140.60	446.39	10.00
HC 092	1276.71	11.90	71.20	833.85	36025.01	15.50	6.85
HC 093	137.57	850.76	29.61	97.77	151.00	313.26	5.55
HC 094	185.55	11.90	44.31	90.37	872.98	133.26	5.10
HC 095	466.39	1052.43	43.37	176.03	1819.60	256.61	9.23
HC 096	1128.52	936.78	172.62	781.62	18379.33	677.44	12.77
HC 097	269.16	355.46	194.45	232.16	1891.01	170.49	5.22
HC 098	330.50	363.20	59.65	265.71	2927.30	107.93	5.10
HC 099	784.54	11.90	233.04	645.30	12020.86	2352.89	16.33

HC 100	280.74	576.39	17.90	189.18	674.23	139.06	9.50
HC 101	330.50	317.73	17.90	243.61	457.11	74.61	9.00
HC 102	746.29	537.99	17.90	781.08	4489.50	349.24	7.51
HC 103	226.99	677.26	17.90	103.29	151.00	860.74	5.10
HC 104	141.80	232.69	101.38	121.07	950.40	62.73	5.10
HC 105	633.80	11.90	75.31	296.76	3110.48	91.26	6.82
HC 106	893.04	11.90	123.31	238.56	1877.40	72.28	5.22
HC 107	440.52	374.74	106.56	145.61	484.31	71.24	5.22
HC 108	2490.10	515.52	30.36	1697.19	46735.14	462.88	8.50
HC 109	554.25	928.04	17.90	164.40	1566.53	240.21	5.10
HC 110	308.83	332.31	81.92	211.84	2673.86	201.73	5.10
HC 111	505.60	667.97	17.90	164.69	1853.01	195.66	5.55
HC 112	226.99	471.58	40.23	118.84	996.97	281.14	5.55
HC 113	881.11	11.90	86.74	313.23	2665.75	232.19	8.41
OVAR 001	27355.35	6039.27	3006.57	22056.04	590685.13	4494.08	328.82
OVAR 002	30362.35	4824.40	2756.66	23947.85	407469.53	6292.20	1750.75
OVAR 003	33703.40	5955.74	4302.60	24356.62	396344.59	9565.46	1130.59
OVAR 004	23188.86	3015.63	1044.12	12350.16	490870.79	4967.45	1211.97
OVAR 005	9792.32	4086.30	2154.52	23211.16	579291.70	4375.73	261.31
OVAR 006	19437.96	3678.49	1130.87	14851.21	337200.75	3543.28	211.46
OVAR 007	39115.65	5306.90	3824.87	33394.10	1098306.08	5840.31	773.27
OVAR 008	58333.19	7275.79	9292.16	19361.11	215937.47	6976.28	1481.99
OVAR 009	35585.49	4746.29	2661.69	17156.24	501697.91	6745.32	1321.86
OVAR 010	25590.59	4779.44	2255.40	20297.17	923608.80	5935.90	272.34
OVAR 011	36756.86	11.90	4774.00	44763.42	883538.17	5719.71	409.91
OVAR 012	50225.42	6790.87	3381.31	36199.28	989591.44	10605.53	406.02
OVAR 013	51622.80	7519.14	2674.91	23375.50	1112069.37	7367.81	1105.10
OVAR 014	27734.57	10514.47	4847.61	34679.70	969860.71	12233.79	446.92
OVAR 015	61198.88	5051.47	1873.63	27351.54	1217800.61	6196.62	184.79
OVAR 016	36195.41	6095.86	1641.51	15.10	986695.19	15.50	262.70
OVAR 017	23302.36	11.90	1547.76	25693.08	629372.86	4790.08	5.10
OVAR 018	20982.68	4721.41	1486.77	19985.76	597182.17	5394.74	208.87
OVAR 019	35545.84	5666.16	3696.11	26163.65	1130446.35	6647.24	1209.64
OVAR 020	27965.73	5369.92	2014.45	15692.07	300166.76	8701.31	2216.42

OVAR 021	26468.78	4279.67	1972.27	20383.15	452692.54	4903.79	536.78
OVAR 022	44819.76	4668.27	2421.23	29410.07	700273.63	5562.70	665.43
OVAR 023	47401.18	3647.83	17.90	23367.38	1393897.82	6463.44	273.88
OVAR 024	54567.49	11.90	1573.61	14459.86	577797.90	5214.81	701.25
OVAR 025	58635.88	6238.55	2086.44	30275.44	642532.16	8413.06	365.10
OVAR 026	48805.87	5149.59	2723.47	31217.69	1027051.23	6767.19	927.85
OVAR 027	30710.81	5232.13	2870.00	12204.27	481511.87	8323.81	1652.87
OVAR 028	39276.79	4769.71	2852.18	13699.75	473980.63	5150.11	207.34
OVAR 029	36753.32	6237.03	4586.46	34602.69	907098.78	8177.19	381.93
OVAR 030	53527.14	6692.73	1835.98	29063.19	412617.68	7243.18	161.19
OVAR 031	48352.79	6162.30	1598.84	19677.38	402572.35	5967.67	38.69
OVAR 032	25543.25	4122.46	1244.83	40424.23	517317.82	4601.98	172.90
OVAR 033	26461.57	5458.87	3404.22	16267.03	940059.37	7794.14	728.18
OVAR 034	25079.65	3837.23	629.53	28663.04	723801.90	6652.30	762.27
OVAR 035	73189.17	4748.75	3408.97	27023.58	1138977.48	8325.44	1177.64
OVAR 036	27479.65	4987.96	2776.01	26708.75	776057.83	9515.62	167.04
OVAR 037	14269.09	4091.54	1122.65	16239.63	445761.91	6389.86	659.81
OVAR 038	36897.93	4914.35	679.83	9942.49	681200.54	5229.77	532.37
OVAR 039	32676.58	4842.75	692.01	19007.29	740836.74	8580.41	557.05
OVAR 040	51665.06	6438.40	398.96	25869.98	1060218.59	6992.89	412.43
OVAR 041	25629.30	2953.06	740.05	27676.34	316876.93	6727.45	354.36
OVAR 042	33812.75	5182.10	2253.25	21637.61	662379.36	6697.49	906.80
OVAR 043	18078.38	11.90	927.55	11579.95	388142.50	13139.40	992.06
OVAR 044	45603.87	6788.20	1906.71	23540.78	788058.16	11733.85	283.29
BLDR 001	38389.16	4666.64	4096.54	26366.58	975589.58	7869.73	1755.31
BLDR 002	21559.22	5477.26	2114.01	41551.01	641313.91	6285.94	138.00
BLDR 003	42732.03	4776.15	2671.74	28194.41	510181.31	4471.79	314.68
BLDR 004	64237.77	5019.41	3291.52	26721.39	926398.95	6028.82	414.65
BLDR 005	39282.35	4948.68	2655.20	36534.41	1118746.28	6348.22	342.56

BLDR 006	46070.46	6467.22	1210.96	24142.37	862670.89	7123.51	353.45
BLDR 007	24958.92	5247.86	425.41	27896.12	874007.01	4123.41	375.82
BLDR 008	45876.71	7772.91	662.77	30398.65	277263.45	12388.68	670.41
BLDR 009	25662.28	3287.38	723.53	21876.03	544762.73	4210.32	235.37
BLDR 010	39913.17	6870.40	2173.49	42839.34	672941.66	11961.86	296.21
BLDR 011	41725.56	4862.35	614.03	26377.04	452590.61	6353.42	345.67
BLDR 012	41427.18	5358.59	658.75	36742.62	491737.81	6561.59	345.78
BLDR 013	53730.86	11.90	2306.75	25646.40	321989.37	7355.63	930.09
BLDR 014	45412.48	5019.41	835.20	28370.45	407915.99	9237.47	468.63
BLDR 015	34092.55	6684.66	1934.79	46948.33	983005.36	8856.20	931.65
BLDR 016	25787.77	5436.96	3094.45	22262.26	983241.55	5871.44	316.08
BLDR 017	53719.71	6082.22	3917.54	29932.59	410453.18	7319.80	793.02
BLDR 018	59505.24	8644.53	1287.34	34518.81	669306.56	9159.49	497.43
BLDR 019	63758.71	7552.60	3350.17	28296.48	795223.22	10032.52	1398.30
BLDR 020	46366.40	11.90	3133.43	38382.62	1083176.68	10802.25	542.64
BLDR 021	3791.99	8055.29	1886.59	28445.42	790007.80	9388.90	893.09
BLDR 022	37909.62	5566.63	1540.13	23297.69	881365.51	6311.96	231.91
BLDR 023	53840.81	7398.33	2338.84	26660.38	765281.11	8454.01	218.46
BLDR 024	41025.00	8071.05	5276.98	28790.62	1009774.72	13571.80	802.18
BLDR 025	44326.68	11.90	3158.47	26116.37	1124629.33	8640.47	274.27
BLDR 026	34566.26	5211.71	63.97	23759.08	550106.51	6014.71	243.95
BLDR 027	53927.89	7592.30	3895.47	20985.44	892418.94	8652.99	1586.26
BLDR 028	39115.65	7000.97	2054.64	21084.28	1261080.50	6196.62	690.04
BLDR 029	45631.78	5929.72	1630.41	34824.52	1133333.39	8398.92	846.77
BLDR 030	57116.97	5147.43	2470.76	23969.38	589887.61	7610.42	817.97
BLDR 031	49228.35	6900.45	4847.61	42949.71	1171874.48	7943.04	1097.34
BLDR 032	31435.45	6238.55	2838.81	18554.85	728944.62	5319.88	527.98
BLDR 033	35546.38	4674.99	1747.27	29408.37	451124.15	5627.77	468.37
BLDR 034	48503.16	6033.51	1811.00	25804.44	970584.77	6170.13	153.43

BLDR 035	38847.34	7017.11	3461.86	34401.60	1418768.58	8508.69	1834.61
BLDR 036	64693.93	8465.74	3355.93	27880.04	1122638.15	11310.14	1139.10
BLDR 037	52162.95	8457.84	1524.87	21993.73	707789.36	8798.92	1151.03
BLDR 038	27697.90	6610.33	3048.99	32148.42	1680220.10	10088.57	772.33
BLDR 039	42251.33	8347.23	980.21	27007.60	689509.13	14986.44	1780.85
BLDR 040	26964.45	6779.13	1452.54	23914.66	1106708.75	7739.51	324.51
BLDR 041	29630.58	4418.37	2265.93	13737.04	660708.89	5720.15	676.98
BLDR 042	30753.95	5762.15	3076.38	16644.42	653808.75	9077.23	1268.24
BLDR 043	31468.09	6113.87	1844.15	30780.04	1501358.89	8967.35	628.89
BLDR 044	37101.20	8051.22	4621.91	32836.62	1088760.40	7821.46	998.17
BLDR 045	37409.23	6128.58	1576.71	22172.06	422834.55	9667.79	827.92
BLDR 046	32994.25	4033.99	1793.59	25020.24	998551.73	4996.07	239.60
BLDR 047	51986.22	7331.60	2547.17	27425.79	1283199.28	11662.80	1286.47
BLDR 048	19804.53	6607.09	2307.00	30142.42	470458.40	10580.26	1318.39
PDAC 001	12287.00	4302.91	3071.87	23746.78	824302.67	4151.23	162.43
PDAC 002	36738.44	6763.35	2103.43	24034.28	1007223.98	5491.50	786.83
PDAC 003	18496.23	6043.25	2723.47	22071.88	434748.82	7131.90	1945.24
PDAC 004	28859.40	5295.09	1024.48	28817.13	1175508.11	4385.17	530.18
PDAC 005	44600.07	6896.16	3085.42	32284.54	645767.11	4338.07	130.30
PDAC 006	59227.71	11.90	3395.13	27758.30	762692.74	7710.03	203.23
PDAC 007	19075.05	4380.47	1934.42	17335.64	591714.42	6778.14	1834.61
PDAC 008	76243.34	6298.45	3489.54	41104.24	1104230.67	8276.37	813.99
PDAC 009	26191.02	4722.87	1423.01	26730.13	477349.16	3784.96	286.50
PDAC 010	68959.93	7396.47	4303.76	28477.46	1216132.17	8657.16	582.39
PDAC 011	59661.47	8913.07	2981.86	18323.24	634412.23	10915.36	1543.55
PDAC 012	51496.07	6390.39	2464.68	23416.17	792898.19	5100.53	598.64
PDAC 013	58189.15	6430.40	1786.06	24302.75	519279.06	6739.86	904.99
PDAC 014	51425.68	4279.67	2295.90	20857.82	1065762.66	5160.05	829.87
PDAC 015	73580.20	7698.10	2696.96	8432.32	873518.60	8187.73	902.71

PDAC 016	51425.68	11.90	2050.40	15281.90	941838.20	5603.53	868.51
PDAC 017	26860.88	4957.41	1942.82	21419.09	1316117.02	6452.69	1135.23
PDAC 018	31124.57	5896.13	2630.89	17116.86	1056437.51	7481.20	764.24
PDAC 019	57671.17	7231.27	735.39	30528.12	1122095.61	7131.90	207.34
PDAC 020	48499.28	6502.47	3004.32	21836.90	219002.75	9780.67	2426.26
PDAC 021	5920.40	5326.59	702.79	27753.86	791453.58	6463.44	1714.90
PDAC 022	110769.32	5721.60	4823.37	35667.39	1121001.84	4894.02	316.08
PDAC 023	50372.00	5674.07	1947.02	29208.60	1244156.97	6260.28	594.21
PDAC 024	38726.69	6430.40	3121.58	18213.33	1243229.34	5840.31	918.70
PDAC 025	22249.06	4039.98	2434.26	24429.23	586341.09	9067.36	1446.56
PDAC 026	32318.85	7114.01	1182.41	18538.27	779653.15	5562.70	475.41
PDAC 027	45672.83	5212.47	1769.44	36620.38	638741.93	3685.96	484.14
PDAC 028	45287.23	8541.61	2186.53	29787.71	641070.19	8430.96	466.68
PDAC 029	43900.80	4539.23	822.32	14701.98	611300.38	3128.10	259.87
PDAC 030	72921.38	8065.48	3225.32	24984.28	1143176.67	10236.51	2243.53
PDAC 031	27832.57	5862.18	1437.34	14963.57	1099830.14	6737.95	548.51
PDAC 032	38694.24	11.90	710.32	30010.47	1056024.29	9619.13	782.44
PDAC 033	71813.23	11.90	1948.84	27794.56	1210430.88	8263.25	613.20
PDAC 034	52557.60	6056.89	2652.28	32590.99	1232333.80	7112.32	542.64
PDAC 035	34595.35	5512.23	1259.54	23645.61	819047.15	10061.16	1674.49
PDAC 036	38952.07	11.90	2563.30	29180.00	1079918.39	8159.84	1059.60
PDAC 037	43217.84	8485.84	4242.71	23282.35	1179112.98	11026.57	2247.10
PDAC 038	27869.34	5741.57	1697.20	28979.73	417667.32	6333.06	272.34
PDAC 039	27795.82	3594.98	898.18	8871.82	429407.88	3905.04	132.51
PDAC 040	29407.15	3849.03	650.85	23430.23	391893.76	3803.26	289.71
PDAC 041	37756.20	4952.24	2294.48	21809.82	620446.75	8945.44	1906.08
PDAC 042	57480.24	4901.33	3048.93	22031.65	771081.77	6617.17	756.04
PDAC 043	44010.30	4806.53	1570.68	19442.76	783616.68	5480.54	98.44
PDAC 044	25881.58	4269.30	1154.24	17329.21	813488.66	4129.22	124.92

HC 001	31841.74	5100.90	1958.59	34796.71	1142911.93	15.50	984.20
HC 002	32317.03	6916.11	1950.79	35980.28	1154768.48	10643.49	1139.10
HC 003	26027.23	6259.60	2297.07	27466.19	442885.96	7543.36	336.13
HC 004	26781.52	6626.63	2386.69	29192.54	430973.97	6997.69	239.60
HC 005	25275.84	7159.01	3377.07	23172.93	306888.94	10278.80	332.26
HC 006	28274.19	11.90	2352.78	16730.78	786553.51	7829.75	996.09
HC 007	26027.23	5015.65	1913.80	17636.59	213027.68	5735.07	821.92
HC 008	22836.08	5457.86	2231.63	25325.52	274229.22	6333.06	155.34
HC 009	18040.40	11.90	1841.97	14018.02	453267.37	15.50	340.01
HC 010	23098.97	6185.51	2251.43	27131.89	280954.13	6975.93	162.97
HC 011	17390.74	5905.00	1937.15	15330.51	502913.24	7271.60	309.03
HC 012	24768.49	9926.83	2794.80	23553.73	396646.98	10141.78	140.11
HC 013	24720.24	7363.00	2672.57	21272.51	381609.48	10872.40	355.52
HC 014	27477.53	7555.45	3217.05	24847.14	516441.55	7841.05	170.60
HC 015	25760.28	11.90	2934.39	22148.62	399423.38	8240.23	243.45
HC 016	22513.96	11.90	1553.49	19791.36	476234.79	7660.85	164.87
HC 017	44696.30	5294.82	3419.44	29125.68	691029.26	4971.42	239.60
HC 018	23805.81	5831.05	1774.28	19210.40	447676.34	6507.91	212.71
HC 019	23997.96	5889.43	1890.47	21222.26	517223.94	8552.88	444.97
HC 020	23589.88	5504.46	1731.85	19408.02	448820.85	6694.96	343.88
HC 021	30075.08	7206.06	2988.07	24399.76	266920.49	6759.47	147.72
HC 022	31554.59	7382.63	2948.83	24864.43	291274.60	7762.04	136.31
HC 023	33509.85	8434.13	3360.16	27047.66	394403.63	10079.74	394.36
HC 024	37281.29	6267.40	3585.67	27741.72	380992.93	4035.46	151.53
HC 025	27123.12	11.90	3054.36	22218.01	695821.62	9274.57	332.26
HC 026	30099.86	7127.65	3029.47	29726.47	995745.99	9358.76	1458.21
HC 027	30422.26	7010.09	3212.86	17066.76	607617.32	7079.51	672.13
HC 028	31629.46	6220.60	3330.60	18026.91	524015.40	6164.89	723.30
HC 029	26610.95	8552.70	2928.21	21596.69	639405.25	10042.59	601.43
HC 030	30041.88	5711.09	2959.20	27271.53	611828.95	5931.67	1089.89
HC 031	34269.09	8807.62	4403.16	21371.66	505768.59	10191.87	1323.86
HC 032	15115.63	7065.20	2126.74	10733.03	498130.70	10915.78	707.08
HC 033	19149.02	5174.93	2399.43	22900.71	254864.80	9714.92	306.96
HC 034	15571.44	5225.34	1831.65	18841.38	353601.09	7968.36	295.12
HC 035	15782.15	7185.48	2456.83	11428.37	516783.45	9544.07	497.18
HC 036	20286.01	5175.07	2434.54	24003.15	279609.98	8007.40	215.59
HC 037	1727.10	1324.23	17.90	2417.45	19877.60	465.67	5.10
HC 038	16327.46	6735.98	2771.40	11319.83	767898.65	9735.54	840.04
HC 039	18629.61	5732.96	2196.25	21909.98	271084.25	10880.27	395.92
HC 040	21237.55	7665.10	1891.95	25600.70	446860.83	7600.98	419.07
HC 041	38296.83	4909.28	3909.75	20392.54	510339.63	7293.76	1757.68
HC 042	61263.15	7533.98	5178.36	30300.53	920451.68	7332.23	1762.87
HC 043	41103.09	5488.93	1704.90	26185.29	745564.34	5194.36	162.97
HC 044	19992.51	5263.78	1654.94	19155.05	254010.45	6412.35	262.70

HC 045	20427.98	5691.01	1874.94	19387.18	289004.51	6269.83	285.85
HC 046	33976.21	5248.26	762.36	17730.98	1005158.81	4956.66	178.24
HC 047	51706.09	6660.60	1369.01	20843.50	1491433.43	7013.30	315.09
HC 048	50785.62	6002.48	1353.78	20926.35	1431872.39	6880.13	379.82
HC 049	33183.60	7101.68	5296.69	27534.17	504793.27	8466.52	641.03
HC 050	24717.21	6687.49	743.30	21516.07	1273402.69	8012.99	126.15
HC 051	22353.55	6490.69	789.78	21186.28	1546192.85	9955.05	367.17
HC 052	36215.15	7592.45	6320.05	30588.31	611099.85	7864.43	249.98
HC 053	47887.13	7231.27	1600.24	24766.70	858136.22	7606.72	576.49
HC 054	64033.49	7683.86	3214.13	33649.93	1121566.60	8408.27	310.96
HC 055	28130.81	7319.20	3468.97	12379.60	624021.42	6610.65	458.99
HC 056	27727.36	7796.36	1674.43	16970.58	465825.84	5944.36	122.76
HC 057	28475.89	5224.27	3344.67	29017.03	909945.36	7929.95	1786.66
HC 058	30063.31	7074.56	6724.23	36571.68	1109799.59	7571.18	186.87
HC 059	34258.87	7319.20	8007.33	36885.79	1579157.23	8642.43	315.09
HC 060	37297.15	6158.77	1461.51	26178.70	538439.26	7311.37	440.59
HC 061	62884.33	6885.13	3048.93	35006.45	752912.48	8612.99	348.30
HC 062	47329.19	8625.31	6740.75	31829.93	1154663.18	6578.10	645.57
HC 063	45714.60	9455.11	6962.90	32035.13	1173495.19	10810.96	809.90
HC 064	22101.16	6286.46	1921.82	12724.97	518009.08	6302.85	798.14
HC 065	23753.91	8420.87	3176.33	28296.28	1337237.84	7878.52	682.10
HC 066	80434.98	9469.27	8501.46	33565.51	1499410.39	9750.67	723.55
HC 067	35704.49	6550.56	535.15	18376.45	751411.20	4830.66	71.67
HC 068	72032.06	6768.24	6408.38	30368.06	1128797.64	6333.03	365.07
HC 069	57943.59	7885.52	3360.19	33113.76	673007.01	8554.26	506.97
HC 070	54181.30	7002.30	5560.69	25104.03	1407769.68	6840.40	420.22
HC 071	37236.05	6571.10	5994.81	35125.41	1123521.06	11093.36	1564.45
HC 072	52235.68	5887.90	4881.54	24531.17	1115965.11	5848.54	286.38
HC 073	33629.73	5747.30	5189.19	33056.22	1426989.91	9165.51	1311.66
HC 074	32835.80	5791.19	4697.91	32416.63	1532146.95	10386.49	1345.02
HC 075	34300.88	5967.19	5236.57	28530.72	1158245.74	6435.73	1561.80
HC 076	40502.19	7083.60	4006.06	14999.30	1068571.23	7337.53	1569.75
HC 077	97498.41	7720.46	5503.24	32977.85	387305.61	9287.20	2619.47
HC 078	101360.68	7867.16	5439.54	32305.54	389083.86	10993.25	2885.97
HC 079	41703.50	7310.12	4124.10	15123.81	1053558.83	10145.64	1598.99
HC 080	85260.93	6678.52	4688.60	29915.12	377938.94	8205.91	2441.75
HC 081	43407.83	7982.05	4484.71	15894.34	1258219.55	11354.23	1725.18
HC 082	34749.62	7346.46	6036.92	26603.41	411875.83	10483.66	1162.27
HC 083	53069.98	10205.59	1752.62	26280.87	821006.42	5512.25	65.13
HC 084	36753.32	8737.13	5804.38	14386.67	1026223.01	10402.65	950.67
HC 085	35833.63	7446.53	5862.36	14271.38	1067138.87	6695.59	1134.79
HC 086	49598.31	6575.57	6767.21	27720.19	622117.01	9891.93	1258.10
HC 087	38576.54	8774.46	6173.31	29987.06	451707.46	11160.37	695.88
HC 088	32183.70	5646.55	4169.65	32543.48	768937.07	10305.88	1438.26

HC 089	28428.76	6250.34	4206.16	21617.09	833421.91	9478.93	1612.32
HC 090	29981.21	5233.12	4261.01	21083.87	917130.64	6578.10	1535.34
HC 091	33239.31	7720.46	5535.15	28170.98	465418.74	10943.37	1240.34
HC 092	30748.98	6090.84	4608.09	21778.67	900442.27	8716.23	1894.73
HC 093	34048.92	6602.40	5484.12	32665.41	1267133.15	10893.62	2247.10
HC 094	56448.08	6201.54	5516.00	24839.64	1191544.07	6800.77	695.88
HC 095	53252.98	8629.11	3684.05	28671.09	624675.83	7834.57	415.67
HC 096	58067.28	6786.20	5420.46	25811.92	1202440.56	8627.70	718.93
HC 097	48341.81	5773.63	4414.02	22591.24	780094.12	4909.72	647.85
HC 098	32219.97	5743.56	2994.58	29637.01	988063.59	9290.25	1300.79
HC 099	22789.49	5814.92	2139.86	15512.49	518312.27	9911.81	1044.10
HC 100	34098.67	4299.20	1169.46	30622.44	417092.83	7143.41	251.35
HC 101	33838.26	3462.67	1400.47	30167.31	274546.73	4671.77	114.02
HC 102	33708.17	3794.06	1364.98	32463.76	296915.54	5395.53	97.67
HC 103	33682.16	4842.56	1719.53	31125.36	284800.59	7746.82	291.02
HC 104	31380.27	5739.16	3649.51	34848.13	1133226.35	9332.93	1329.15
HC 105	44416.04	6010.60	1948.14	29468.25	750846.01	5111.30	132.30
HC 106	41100.39	5293.76	1616.33	26396.45	517281.53	4219.98	99.49
HC 107	36772.94	5858.81	1515.56	26294.92	620656.89	4427.69	117.67
HC 108	41006.33	5898.73	3329.33	29601.05	886748.44	9824.71	1222.78
HC 109	40402.53	6018.60	1899.32	28022.56	900230.31	7883.29	987.61
HC 110	41396.26	5675.40	3218.86	31274.29	1129417.12	9078.79	867.22
HC 111	41382.80	6383.11	1806.13	29357.87	881844.20	7448.52	843.25
HC 112	43219.88	6672.53	3378.06	32196.36	1277496.83	9713.17	995.67
HC 113	53595.20	8997.71	1977.06	32024.31	504970.40	8179.41	292.51
Subject Cohort ID	**sVEGFR3**	**sc-kit/SCFR**	**CA 125**	**CA 15-3**	**CA 19-9**	**CEA**	**FGF2**
OVAR 001	1342.36	411.09	2.09	0.08	1.05	5.20	3.60
OVAR 002	1025.29	333.61	0.20	0.04	4.44	5.20	3.60
OVAR 003	1104.11	228.26	0.20	0.12	0.81	5.20	3.60
OVAR 004	233.00	53.12	10.78	0.12	1.19	5.20	12.15
OVAR 005	643.65	263.99	4.41	0.53	0.30	8.52	3.60
OVAR 006	233.00	249.04	1.32	0.28	2.25	5.20	3.60
OVAR 007	473.59	347.00	11.92	0.05	71.06	5.20	6.65
OVAR 008	233.00	81.03	78.03	2.09	95.71	5.20	6.65
OVAR 009	233.00	140.17	27.09	32.70	22.23	24.36	9.27
OVAR 010	242.17	47.44	0.70	0.03	2.24	5.20	11.02
OVAR 011	233.00	99.29	7.71	0.14	3.00	5.20	12.15

OVAR 012	233.00	149.01	39.43	0.16	82.74	5.20	3.60
OVAR 013	233.00	785.74	8.64	0.24	1.07	9.17	3.60
OVAR 014	233.00	226.88	37.79	2.07	127.18	9.57	10.31
OVAR 015	233.00	164.22	18.97	0.92	3182.93	11.43	9.25
OVAR 016	1193.88	149.55	3.17	0.20	12.69	8.42	3.60
OVAR 017	1521.92	175.17	10.62	0.66	8.72	5.20	3.60
OVAR 018	1429.66	186.30	9.65	0.50	16.36	5.84	3.60
OVAR 019	653.92	231.07	3.90	1.02	5.05	5.20	10.24
OVAR 020	973.37	87.35	4.87	0.03	28.32	5.20	3.60
OVAR 021	1740.51	30.50	1.06	0.03	0.89	5.20	10.24
OVAR 022	1548.34	30.50	1.49	0.27	5.29	5.20	8.12
OVAR 023	1800.37	351.60	10.45	0.12	13.20	8.85	8.12
OVAR 024	1083.33	364.47	1.18	0.41	3.53	5.20	11.63
OVAR 025	1807.03	325.20	16.89	0.37	27.48	13.95	8.12
OVAR 026	921.84	971.04	28.19	0.13	24.89	9.41	14.36
OVAR 027	410.05	567.59	51.08	2.20	17.50	12.41	10.98
OVAR 028	284.17	74.03	13.26	0.57	6.63	10.53	10.81
OVAR 029	473.84	69.37	24.50	0.76	205.88	5.20	9.65
OVAR 030	323.70	317.49	18.21	0.62	14.50	5.20	7.90
OVAR 031	233.00	761.88	2.12	0.19	1.80	5.20	9.26
OVAR 032	793.67	86.00	0.56	0.03	0.48	5.20	3.60
OVAR 033	1218.87	186.94	0.20	0.09	14.29	5.20	3.60
OVAR 034	451.03	286.62	5.97	0.10	17.61	7.51	10.98
OVAR 035	267.40	433.51	4.36	0.40	1880.47	85.72	4.60
OVAR 036	301.05	178.93	98.12	1.17	5.82	10.61	4.60
OVAR 037	233.00	143.37	15.96	0.10	3.12	5.20	9.25
OVAR 038	782.87	52.95	25.96	0.24	28.66	62.84	4.60
OVAR 039	233.00	51.69	36.37	2.14	74.21	5.20	12.15
OVAR 040	321.66	160.97	0.63	0.24	0.69	5.20	3.60

OVAR 041	835.21	133.99	2.40	0.05	9.65	5.20	15.74
OVAR 042	812.39	81.92	7.06	1.53	38.22	23.89	46.17
OVAR 043	464.43	38.14	34.68	0.09	49.28	6.20	15.74
OVAR 044	934.28	202.96	1.11	1.37	2.66	128.81	41.44
BLDR 001	233.00	839.21	0.70	0.50	11.46	9.93	6.00
BLDR 002	1082.58	152.02	0.28	0.17	0.71	5.20	9.65
BLDR 003	233.00	205.81	0.28	0.19	1.73	5.20	6.00
BLDR 004	312.35	130.59	2.36	0.13	133.15	10.93	6.00
BLDR 005	233.00	730.15	0.39	0.70	2.39	20.10	6.00
BLDR 006	451.03	410.08	0.45	0.42	1.84	9.86	6.00
BLDR 007	786.51	66.93	5.93	1.40	36.01	22037.96	12.10
BLDR 008	233.00	257.65	0.20	0.27	2.90	5.20	13.72
BLDR 009	382.18	30.50	1.49	0.21	0.30	5.20	11.68
BLDR 010	233.00	116.38	3.43	0.06	0.30	5.20	16.27
BLDR 011	520.80	230.36	0.23	0.05	0.39	5.20	9.65
BLDR 012	261.09	1519.26	1.86	0.11	0.47	5.20	3.60
BLDR 013	394.54	977.41	1.00	0.29	0.54	5.20	8.52
BLDR 014	306.00	184.91	1.17	0.03	0.43	5.20	3.60
BLDR 015	630.77	215.24	0.55	0.10	0.30	9.96	7.60
BLDR 016	1003.10	137.25	0.90	0.05	0.39	5.20	6.56
BLDR 017	572.52	437.49	0.76	0.22	0.85	5.20	13.72
BLDR 018	1179.90	343.17	1.21	0.25	2.81	29.86	6.56
BLDR 019	233.00	408.17	0.63	0.05	2.04	5.20	10.31
BLDR 020	351.03	161.17	2.54	0.18	1.64	5.20	13.48
BLDR 021	427.56	119.34	0.78	0.58	5.27	20.14	6.56
BLDR 022	233.00	454.35	0.53	0.08	0.33	5.20	3.60
BLDR 023	453.46	303.15	0.23	0.06	0.30	5.20	3.60
BLDR 024	515.69	139.21	0.61	0.09	0.30	5.20	3.60
BLDR 025	233.00	194.66	0.84	0.16	0.30	5.20	3.78

BLDR 026	653.58	238.48	0.79	0.21	2.24	5.20	13.72
BLDR 027	233.00	168.18	0.67	0.16	3.34	5.20	8.52
BLDR 028	2762.42	167.38	2.46	0.04	0.30	5.20	8.52
BLDR 029	637.34	30.50	1.43	0.07	0.47	5.20	13.72
BLDR 030	1444.17	187.24	0.87	0.12	1.09	5.20	9.65
BLDR 031	1068.24	259.22	0.83	0.19	13.76	49.86	9.65
BLDR 032	727.97	472.63	0.20	0.14	0.30	5.20	10.07
BLDR 033	251.06	129.00	1.13	1.56	5.56	40.07	13.63
BLDR 034	233.00	116.38	0.20	0.03	9.38	5.20	13.63
BLDR 035	336.26	30.50	0.77	0.20	3.25	5.20	9.65
BLDR 036	2688.94	329.48	0.28	0.07	0.84	5.20	3.60
BLDR 037	233.00	514.06	2.36	1.34	1156.00	5.20	9.65
BLDR 038	1175.93	60.18	0.36	0.03	10.86	7.33	15.74
BLDR 039	570.53	138.56	1.44	0.10	2.16	6.90	11.02
BLDR 040	3091.45	135.77	0.43	0.14	0.48	7.30	3.60
BLDR 041	1687.24	30.50	12.61	0.29	16.87	7.10	15.74
BLDR 042	1996.94	127.50	2.17	0.16	1.59	7.10	15.74
BLDR 043	1494.29	756.12	2.98	0.32	0.93	10.79	15.74
BLDR 044	675.74	156.67	0.80	1.74	5.17	31.48	50.60
BLDR 045	1048.86	123.17	0.89	0.47	0.93	59.43	20.20
BLDR 046	369.49	570.42	2.01	0.21	3.37	5.20	3.60
BLDR 047	407.06	170.98	0.24	0.35	1.22	5.20	9.65
BLDR 048	233.00	30.50	0.78	0.11	3.61	5.20	9.65
PDAC 001	618.60	114.36	0.54	0.46	2.08	5.20	3.60
PDAC 002	233.00	681.33	0.75	0.08	20.62	5.20	3.60
PDAC 003	546.11	123.08	1.37	4.78	154.64	46.23	18.60
PDAC 004	233.00	87.07	2.98	0.08	12.26	15.14	6.65
PDAC 005	522.17	262.65	1.18	0.06	5.16	5.20	4.64
PDAC 006	992.73	164.76	1.27	0.13	12.49	22.79	3.60

PDAC 007	269.65	151.62	0.68	0.32	1702.03	10.49	4.64
PDAC 008	967.32	134.69	1.85	0.17	221.51	15.92	7.90
PDAC 009	342.58	173.78	2.22	0.05	86.11	5.20	10.98
PDAC 010	360.92	334.26	0.49	0.08	5.56	5.20	3.60
PDAC 011	2459.74	109.42	1.19	0.13	16.98	7.58	10.98
PDAC 012	492.81	236.23	3.63	0.32	2.30	5.20	16.65
PDAC 013	261.84	1269.88	3.47	0.16	74.18	5.20	6.00
PDAC 014	233.00	53.12	1.56	0.06	119.25	5.20	6.65
PDAC 015	1176.21	477.66	2.56	0.03	3.27	5.20	7.90
PDAC 016	783.86	170.77	0.84	0.19	385.41	50.70	11.02
PDAC 017	687.91	87.22	0.20	0.21	3.55	5.20	9.44
PDAC 018	785.97	104.34	0.98	0.12	2.55	10.42	9.44
PDAC 019	233.00	294.63	4.56	0.80	84.05	5.20	9.44
PDAC 020	942.11	269.29	0.62	0.18	107.15	13.02	6.00
PDAC 021	641.28	67.20	1.03	0.14	13.41	5.20	9.20
PDAC 022	1246.08	569.73	2.97	0.15	258.33	5.20	9.44
PDAC 023	819.22	279.04	1.38	0.38	10.01	8.96	9.25
PDAC 024	1742.13	90.66	2.12	0.29	25.16	5.20	9.25
PDAC 025	233.00	343.17	2.06	0.08	72.02	7.04	9.25
PDAC 026	1735.59	30.50	2.68	0.08	1.35	17.70	9.25
PDAC 027	510.24	249.41	0.40	0.16	5.74	6.67	4.13
PDAC 028	233.00	625.43	3.22	0.31	48.47	5.20	13.63
PDAC 029	609.88	372.05	0.20	0.54	3.76	24.00	11.02
PDAC 030	644.55	270.57	1.32	0.41	68.16	5.20	12.43
PDAC 031	233.00	346.11	1.02	0.38	1.43	5.20	3.60
PDAC 032	233.00	358.61	3.05	0.42	6.95	9.03	16.27
PDAC 033	233.00	67.64	0.80	0.13	175.48	5.20	14.21
PDAC 034	512.12	1015.07	0.77	0.45	211.04	29.87	13.48
PDAC 035	233.00	111.69	0.72	0.06	40.52	5.20	3.60

PDAC 036	351.03	263.66	0.64	0.05	13.77	5.20	3.60
PDAC 037	381.17	170.90	3.78	0.08	134.39	5.20	9.65
PDAC 038	314.23	684.92	0.59	0.17	0.93	5.20	3.60
PDAC 039	233.00	142.57	3.52	0.30	18.57	5.20	3.60
PDAC 040	233.00	50.27	1.03	0.22	4.41	5.20	3.60
PDAC 041	1903.91	30.50	0.69	0.19	0.30	5.20	15.74
PDAC 042	233.00	109.56	0.67	0.09	1.39	5.20	9.65
PDAC 043	233.00	117.95	1.23	0.17	730.63	17.30	16.65
PDAC 044	233.00	81.25	0.50	0.23	7.73	5.20	3.60
HC 001	2003.15	30.50	2.15	0.13	0.98	5.20	11.02
HC 002	622.76	159.04	0.45	0.07	0.30	5.20	3.60
HC 003	1678.31	943.53	1.18	0.25	1.82	5.20	24.40
HC 004	1442.83	387.40	0.20	0.54	2.65	5.33	24.40
HC 005	2887.75	193.53	1.35	0.42	3.79	5.67	24.40
HC 006	748.66	869.14	0.88	0.05	0.30	5.20	3.60
HC 007	1914.25	124.85	1.93	0.25	2.51	5.20	3.60
HC 008	1973.49	194.31	0.95	0.13	1.13	5.20	41.13
HC 009	1069.96	211.32	1.64	0.08	0.30	5.20	3.60
HC 010	4026.15	217.18	0.87	0.08	1.30	5.20	24.40
HC 011	233.00	486.24	1.58	0.50	0.68	8.96	11.49
HC 012	629.72	924.29	0.84	0.10	0.77	5.20	24.40
HC 013	484.49	1048.41	0.33	0.23	0.77	6.98	24.40
HC 014	1168.83	481.82	0.51	0.16	0.77	5.20	24.40
HC 015	546.48	174.68	0.57	0.17	0.77	5.20	24.40
HC 016	2766.81	214.02	0.33	0.11	0.40	8.26	24.40
HC 017	233.00	1263.86	0.20	0.13	0.30	5.20	9.29
HC 018	1899.46	263.99	0.39	0.10	0.30	5.82	24.40
HC 019	484.49	66.73	0.21	0.08	0.30	5.20	24.40
HC 020	567.23	1773.72	0.49	0.06	0.40	5.20	24.40
HC 021	734.61	430.56	0.54	0.10	0.98	5.20	3.60
HC 022	911.23	360.17	0.53	0.15	0.98	5.20	6.65
HC 023	996.71	256.83	1.05	0.12	1.14	5.20	11.02
HC 024	769.77	285.53	1.23	0.10	1.14	5.20	6.65
HC 025	1128.03	490.42	4.03	0.64	0.92	21.39	6.00
HC 026	1364.14	166.85	0.20	0.06	0.81	5.20	8.06
HC 027	768.16	180.73	1.16	0.12	20.08	30.69	3.60
HC 028	233.00	178.93	1.92	0.10	0.30	12.23	3.60
HC 029	1272.23	439.20	1.44	0.09	0.30	5.20	3.60
HC 030	233.00	30.50	1.23	0.20	1.37	8.47	24.02
HC 031	233.00	30.50	2.83	0.22	0.30	19.92	24.02

HC 032	494.51	136.15	2.52	0.14	0.30	8.47	15.74
HC 033	1041.21	224.44	0.47	0.91	0.93	5.20	19.88
HC 034	1248.11	288.71	0.36	0.09	0.30	8.01	15.74
HC 035	842.82	459.26	0.97	3.08	3.08	12.20	30.60
HC 036	873.36	418.71	1.07	0.91	2.43	11.94	37.31
HC 037	2916.21	301.54	1.03	0.12	0.48	12.91	24.02
HC 038	873.29	590.90	1.88	1.26	1.81	132.32	41.44
HC 039	675.74	133.99	0.58	0.09	1.37	6.65	24.02
HC 040	233.00	176.32	0.20	0.12	0.30	5.20	13.72
HC 041	2276.58	288.71	0.36	0.03	0.30	5.20	15.74
HC 042	233.00	30.50	0.20	0.03	0.47	5.20	13.72
HC 043	233.00	143.19	0.89	0.07	1.23	5.20	8.85
HC 044	636.86	487.63	0.57	0.14	0.57	5.20	10.24
HC 045	233.00	378.55	0.54	0.11	0.30	5.20	4.60
HC 046	847.39	367.64	1.92	0.20	3.08	6.77	3.60
HC 047	691.97	232.27	1.79	0.25	3.49	15.36	3.60
HC 048	1057.10	160.98	1.61	0.19	2.97	6.30	3.60
HC 049	323.38	30.89	1.60	0.09	0.58	5.20	3.60
HC 050	284.17	55.04	4.45	0.38	1.31	5.60	3.60
HC 051	278.57	681.33	3.84	0.57	1.98	10.35	3.60
HC 052	630.77	421.09	0.20	0.36	4.10	5.20	3.60
HC 053	1259.56	175.01	3.38	0.17	1.44	7.77	13.60
HC 054	392.61	704.27	2.52	0.20	0.97	9.09	13.72
HC 055	415.88	531.00	2.52	1.07	3.40	20.96	12.35
HC 056	355.95	805.08	5.07	0.29	1.22	5.25	13.72
HC 057	1198.41	197.13	1.46	0.20	0.63	5.20	10.98
HC 058	234.19	1084.45	2.08	0.05	2.03	5.20	9.44
HC 059	233.00	171.22	3.97	0.49	4.96	8.74	3.60
HC 060	335.98	736.60	1.25	0.10	1.29	9.68	7.90
HC 061	1037.84	128.08	1.02	0.13	1.53	10.12	14.36
HC 062	1199.41	160.98	1.15	0.29	1.54	6.64	4.13
HC 063	381.03	480.67	1.00	0.31	1.66	6.72	12.57
HC 064	600.80	667.66	2.81	0.82	3.34	18.93	19.17
HC 065	233.00	326.93	0.20	0.03	0.30	5.20	3.60
HC 066	267.40	158.43	0.20	0.03	0.30	5.20	3.60
HC 067	936.84	291.05	1.10	0.11	5.57	22.51	14.36
HC 068	278.57	359.47	9.70	0.21	1.07	8.77	9.25
HC 069	1102.80	167.54	2.45	0.12	0.76	5.20	8.65
HC 070	233.00	113.25	2.61	0.26	0.70	19.45	17.72
HC 071	925.45	431.37	0.49	0.03	0.48	5.20	6.99
HC 072	233.00	694.58	1.56	0.85	1.06	26.07	19.44
HC 073	463.93	188.81	0.39	0.03	0.48	5.20	6.99
HC 074	341.65	440.30	1.65	0.05	0.93	5.20	6.99
HC 075	288.02	766.74	2.19	0.11	1.39	5.20	6.99

HC 076	233.00	193.28	1.51	0.18	1.51	5.20	11.18
HC 077	546.48	75.04	0.98	0.03	0.93	5.20	6.99
HC 078	233.00	103.27	1.03	0.03	1.03	5.20	8.72
HC 079	233.00	180.85	0.74	0.14	0.94	5.20	9.40
HC 080	1700.35	134.14	2.07	0.05	0.95	5.20	12.15
HC 081	233.00	30.50	1.56	0.17	1.29	5.20	8.65
HC 082	1082.58	306.33	0.80	0.03	0.48	5.20	4.37
HC 083	233.00	54.56	0.63	0.04	1.51	5.20	4.46
HC 084	233.00	996.90	8.30	0.82	3.31	29.76	15.72
HC 085	657.60	299.92	2.77	0.23	0.76	5.20	3.60
HC 086	233.00	94.68	0.34	0.19	1.51	5.20	8.65
HC 087	1469.17	76.58	1.06	0.06	0.57	5.20	6.99
HC 088	546.48	154.36	0.58	0.03	0.57	5.20	6.99
HC 089	795.54	122.67	2.59	0.13	1.04	5.20	8.65
HC 090	233.00	491.73	2.95	0.19	0.58	5.20	8.65
HC 091	2450.75	284.73	0.87	0.05	0.30	5.20	3.60
HC 092	233.00	30.50	3.11	0.19	0.58	5.20	4.46
HC 093	1648.93	127.17	0.76	0.10	0.30	5.20	8.28
HC 094	233.00	175.91	2.26	0.40	0.70	21.11	11.18
HC 095	427.72	328.13	3.03	0.18	0.47	16.19	13.72
HC 096	233.00	1730.19	2.13	0.55	0.68	24.46	6.00
HC 097	233.00	531.00	2.24	0.18	0.30	14.00	3.60
HC 098	953.92	322.36	1.18	0.09	0.39	5.20	8.28
HC 099	233.00	901.52	1.98	0.16	0.30	7.00	6.00
HC 100	2271.13	202.98	0.69	0.27	0.76	7.03	8.28
HC 101	1075.41	275.15	1.33	6.69	72.30	96.43	166.83
HC 102	463.93	887.50	1.18	1.99	9.91	42.16	122.56
HC 103	615.80	117.13	1.32	0.13	0.76	5.20	3.60
HC 104	395.74	184.10	1.40	0.05	0.83	5.20	19.06
HC 105	323.70	430.75	1.91	0.06	0.30	5.20	3.60
HC 106	301.05	384.02	1.57	0.10	0.33	5.20	3.60
HC 107	335.09	217.85	3.34	0.05	0.74	5.20	3.60
HC 108	233.00	2479.31	0.57	0.08	1.20	13.53	3.60
HC 109	1553.68	188.81	0.35	0.67	0.61	23.08	29.83
HC 110	1140.04	340.04	0.78	0.24	1.93	51.63	8.28
HC 111	1751.86	250.47	0.22	0.11	0.30	5.20	3.60
HC 112	671.57	233.01	0.50	0.10	0.98	19.59	3.60
HC 113	233.00	308.89	4.08	0.10	0.85	5.20	13.72
OVAR 001	3491.05	26911.82	135.31	6.95	75.32	477.86	82.30
OVAR 002	13284.49	23829.48	33.36	3.42	9.06	532.00	123.09
OVAR 003	17065.04	37306.84	16.21	15.19	29.12	269.28	82.30
OVAR 004	9830.14	13421.94	5.17	6.81	7.73	262.73	125.93

OVAR 005	1399.94	19869.15	24.36	27.53	7.35	707.66	82.30
OVAR 006	2890.65	27217.54	12.95	15.55	43.79	146.49	141.82
OVAR 007	8961.62	43602.74	154.95	7.11	95.21	109.57	72.89
OVAR 008	23414.78	26023.22	2235.84	54.80	2184.60	192.88	97.63
OVAR 009	12234.80	15218.78	383.71	124.53	231.88	2819.27	182.10
OVAR 010	11361.26	21799.09	3.70	2.28	41.70	195.28	141.82
OVAR 011	4393.17	19370.71	99.17	9.52	23.86	286.27	162.64
OVAR 012	4057.41	31185.73	76.68	11.19	69.52	340.89	67.09
OVAR 013	14471.74	22664.41	50.60	6.76	16.50	336.24	116.32
OVAR 014	14135.29	15492.26	513.62	30.93	2512.62	481.20	175.20
OVAR 015	2474.98	15736.96	293.78	8.40	5237.94	1053.29	84.24
OVAR 016	6762.13	21253.54	23.30	18.36	476.73	1048.47	213.60
OVAR 017	5438.60	30.50	139.17	37.05	196.39	511.82	269.86
OVAR 018	2260.34	28928.24	158.62	42.34	306.04	1104.21	269.86
OVAR 019	12824.57	26251.88	46.37	43.91	58.86	111.98	24.67
OVAR 020	19178.42	16234.06	46.62	4.96	1349.79	1125.24	332.58
OVAR 021	6453.06	19156.01	3.33	2.80	13.35	127.84	94.71
OVAR 022	6170.82	16212.24	17.16	20.94	210.70	456.15	57.13
OVAR 023	5453.35	15863.35	57.34	8.50	70.45	1758.02	255.25
OVAR 024	6515.89	22682.17	3.28	19.30	74.08	268.43	57.13
OVAR 025	6390.27	25561.88	108.74	15.97	527.93	1582.38	68.09
OVAR 026	12300.25	33225.34	404.02	9.43	117.58	2365.90	115.03
OVAR 027	7780.22	7286.01	251.44	23.79	111.50	279.08	116.44
OVAR 028	4772.67	20208.59	33.96	13.02	31.78	207.10	93.40
OVAR 029	3192.32	34058.65	329.78	23.32	2338.40	207.24	82.30
OVAR 030	1712.90	39273.38	645.60	16.83	107.98	101.87	56.04
OVAR 031	237.57	36861.88	6.46	9.00	34.32	254.43	234.19
OVAR 032	3586.35	19634.10	5.48	7.06	55.01	474.30	175.20
OVAR 033	9946.89	21202.46	53.96	5.23	463.27	215.34	120.75

OVAR 034	8802.25	35636.35	153.51	7.26	259.62	2196.81	112.37
OVAR 035	14261.59	21022.70	79.54	6.88	23291.45	1815.05	68.09
OVAR 036	2640.92	11740.98	926.89	39.14	145.39	390.91	68.09
OVAR 037	9468.52	18038.11	174.46	6.03	53.95	324.85	145.47
OVAR 038	3491.05	7646.22	65.09	4.29	129.19	1901.08	151.01
OVAR 039	6557.49	23081.15	141.30	6.91	486.99	386.04	110.91
OVAR 040	1773.14	15170.92	5.84	15.19	44.83	120.83	93.02
OVAR 041	7086.28	20118.12	15.09	8.43	50.62	140.35	183.61
OVAR 042	10372.70	27422.84	2.80	10.04	33.47	164.45	94.45
OVAR 043	6432.56	6972.70	548.96	13.74	328.48	107.78	303.62
OVAR 044	2171.98	16492.57	39.68	12.15	106.03	405.54	144.15
BLDR 001	26475.67	36370.60	3.36	12.09	176.40	508.14	68.94
BLDR 002	8138.57	46763.31	1.95	20.44	46.53	193.58	82.30
BLDR 003	2267.29	33081.94	2.02	11.65	94.05	398.26	82.17
BLDR 004	6688.55	32151.54	20.54	10.69	1147.53	1898.62	114.04
BLDR 005	3968.36	16588.20	1.93	25.63	62.63	684.06	55.71
BLDR 006	4802.37	12418.04	2.52	16.04	31.46	713.31	36.01
BLDR 007	3733.14	10517.33	18.57	18.96	235.92	151833.12	196.40
BLDR 008	10262.41	27507.92	4.55	13.12	51.49	260.75	122.45
BLDR 009	577.77	16826.56	2.52	13.16	4.77	141.57	82.30
BLDR 010	8669.30	42443.17	3.30	4.45	33.08	402.11	106.30
BLDR 011	9001.87	19023.25	1.81	4.57	26.14	334.48	82.30
BLDR 012	1344.76	15968.01	3.16	3.95	11.46	699.97	153.58
BLDR 013	9771.11	36638.62	4.78	46.70	15.88	261.17	68.41
BLDR 014	3396.11	19762.91	1.95	3.09	9.87	350.86	150.88
BLDR 015	7543.62	23383.82	1.57	4.36	14.03	458.75	62.94
BLDR 016	3189.94	61709.31	3.05	4.54	37.73	306.18	72.08
BLDR 017	11280.50	22793.61	3.86	10.90	41.07	360.46	122.45
BLDR 018	8403.72	28286.73	3.14	4.11	37.89	1016.09	51.13

BLDR 019	12494.87	32987.40	3.34	4.64	59.87	511.82	57.89
BLDR 020	9568.48	27134.48	5.73	24.01	113.98	347.91	70.10
BLDR 021	6694.06	32581.24	2.57	9.95	138.34	775.53	129.42
BLDR 022	1084.59	21194.33	3.18	14.06	54.32	397.19	114.37
BLDR 023	3455.12	36965.02	1.40	14.30	9.87	217.89	3.60
BLDR 024	9843.69	20094.41	2.41	9.23	21.63	596.87	3.60
BLDR 025	4527.69	27806.98	4.15	8.12	14.74	133.57	51.13
BLDR 026	2781.81	15424.78	4.55	14.59	88.49	284.56	122.45
BLDR 027	17935.31	20853.05	3.00	14.24	156.03	640.41	67.96
BLDR 028	6390.27	21742.12	23.24	6.86	24.64	868.18	114.40
BLDR 029	19224.75	16988.87	14.84	8.61	37.54	2455.82	180.10
BLDR 030	13752.84	22708.15	6.71	9.83	92.22	671.33	82.30
BLDR 031	19027.11	38042.01	13.67	5.52	550.38	3828.25	113.41
BLDR 032	15399.51	16290.79	71.26	3.69	8.99	297.69	114.95
BLDR 033	6489.97	26111.20	3.33	11.80	51.32	987.88	141.82
BLDR 034	1604.06	13507.39	5.79	4.28	114.35	238.57	79.52
BLDR 035	9507.87	19384.77	2.66	15.50	172.01	778.73	123.09
BLDR 036	15110.16	38435.72	1.22	6.45	23.35	157.97	3.60
BLDR 037	15145.01	43559.11	3.51	90.83	17624.01	324.00	109.79
BLDR 038	8388.18	21156.05	2.80	6.04	144.30	582.89	183.61
BLDR 039	15179.86	21629.94	5.01	13.19	52.11	194.50	145.57
BLDR 040	8469.99	35753.60	2.04	16.83	35.63	118.97	3.60
BLDR 041	6740.02	26415.21	13.36	8.74	31.00	308.17	144.15
BLDR 042	9790.85	15028.75	3.47	4.78	132.35	446.80	183.61
BLDR 043	7741.31	24248.81	5.99	26.83	45.74	741.41	144.15
BLDR 044	16578.18	24141.23	5.49	6.99	120.39	2936.03	94.45
BLDR 045	10916.40	8719.53	2.47	5.42	23.53	491.77	183.61
BLDR 046	7853.88	27438.99	5.73	14.14	52.58	254.01	181.43
BLDR 047	17135.29	33260.61	3.16	37.29	53.66	322.13	66.09

BLDR 048	10050.25	22568.64	2.88	5.42	99.00	331.77	125.79
PDAC 001	13547.76	20702.87	1.20	17.67	65.76	176.17	68.09
PDAC 002	11483.86	23357.66	3.62	6.42	190.74	805.41	46.18
PDAC 003	8289.78	21206.65	3.62	16.08	655.20	269.13	57.13
PDAC 004	5422.28	27087.13	14.42	9.58	66.75	234.65	85.26
PDAC 005	1428.44	24132.48	5.97	4.04	101.46	170.68	54.40
PDAC 006	5515.51	19213.19	15.42	8.83	186.07	2112.17	57.13
PDAC 007	5577.71	16151.16	8.27	14.96	3313.02	815.08	140.81
PDAC 008	12169.38	32327.66	6.46	12.36	1609.95	1755.03	76.54
PDAC 009	3854.57	19178.00	13.36	9.71	1348.41	562.27	813.09
PDAC 010	4884.79	41589.95	2.64	6.48	498.49	142.38	57.89
PDAC 011	25055.20	9105.48	5.45	7.95	90.77	585.94	77.45
PDAC 012	12693.36	32547.24	2.99	3.79	315.20	576.25	125.93
PDAC 013	11255.92	51321.87	14.22	8.07	1007.76	373.22	55.71
PDAC 014	12693.36	21675.70	8.29	5.38	1911.22	756.83	125.79
PDAC 015	8737.31	25391.83	4.40	2.49	50.11	126.68	98.99
PDAC 016	10282.45	38961.84	5.99	20.19	1973.74	2427.05	82.30
PDAC 017	11321.01	23273.16	1.62	16.17	108.06	113.65	71.84
PDAC 018	11549.03	25311.31	2.12	19.48	39.03	1575.06	118.09
PDAC 019	5639.96	37115.88	9.14	35.98	566.06	503.80	61.89
PDAC 020	31890.93	29963.88	3.53	6.86	1311.41	1080.92	123.83
PDAC 021	21985.40	25857.42	3.62	10.73	531.97	853.36	97.63
PDAC 022	4680.31	17492.90	28.56	4.08	1472.75	811.01	49.33
PDAC 023	4834.30	23718.15	3.26	9.67	155.49	204.05	69.90
PDAC 024	20291.50	18628.63	9.52	13.60	514.80	242.37	62.94
PDAC 025	11288.46	19156.01	13.19	2.46	1790.55	352.54	129.42
PDAC 026	4281.46	16526.53	10.45	5.85	12.14	591.17	72.36
PDAC 027	2712.00	15867.71	2.43	11.27	160.80	245.12	72.62
PDAC 028	8481.40	27789.27	18.22	24.20	385.18	566.03	117.32

PDAC 029	2911.51	17432.28	2.15	12.66	127.39	1109.75	107.47
PDAC 030	30582.80	33073.90	9.81	7.59	629.18	292.72	97.63
PDAC 031	5337.15	16430.14	403.86	21.06	397.48	133.90	141.04
PDAC 032	8127.54	18261.30	3.77	10.71	54.37	76.30	82.30
PDAC 033	8984.42	25532.01	3.61	9.97	72.35	275.94	94.30
PDAC 034	6830.22	43316.54	3.61	7.87	360.26	389.00	67.09
PDAC 035	12503.39	20686.74	7.98	3.50	2003.00	311.56	106.30
PDAC 036	7853.88	51787.63	4.97	2.77	111.65	1377.23	103.74
PDAC 037	25440.11	26329.92	32.83	5.64	5143.00	356.54	82.30
PDAC 038	2425.36	29457.37	2.24	15.36	59.24	111.63	113.41
PDAC 039	2458.40	19413.04	7.89	19.12	182.15	365.16	123.09
PDAC 040	1865.78	11628.44	3.24	29.76	145.42	264.48	165.77
PDAC 041	16695.82	21167.03	4.14	18.03	10.83	257.32	94.45
PDAC 042	6563.12	16683.60	3.20	7.24	50.20	487.36	3.60
PDAC 043	4797.08	15538.97	7.04	3.29	11082.99	489.12	100.56
PDAC 044	3655.56	25916.72	4.13	9.94	79.23	516.84	219.11
HC 001	12572.71	27815.44	4.02	8.37	16.11	18.72	195.12
HC 002	14901.10	30473.79	1.95	7.19	8.21	7.25	120.05
HC 003	14274.44	25405.19	4.28	11.52	21.77	158.84	601.33
HC 004	14344.03	26013.96	3.58	12.63	18.85	139.25	564.82
HC 005	4931.94	37734.09	4.18	17.60	64.66	119.47	120.75
HC 006	16226.55	21904.80	4.75	2.74	3.47	234.62	145.26
HC 007	11050.34	20454.06	4.39	12.65	90.53	161.85	149.40
HC 008	10739.67	25037.41	4.80	9.65	20.80	143.54	529.73
HC 009	1604.06	13192.44	3.53	10.13	16.34	699.47	122.98
HC 010	12122.33	25963.23	4.11	8.76	19.83	142.46	566.24
HC 011	667.80	13558.45	3.70	10.43	16.99	700.33	104.25
HC 012	2425.36	37990.68	4.11	13.44	30.35	137.57	246.79
IIC 013	5506.26	38992.56	4.11	14.60	32.24	130.56	246.79
HC 014	3521.90	42723.78	3.93	13.60	31.30	127.31	196.59
HC 015	4191.62	39301.24	3.93	12.06	26.56	117.10	246.79
HC 016	5438.60	18820.33	3.58	7.30	48.33	730.66	529.73
HC 017	3055.26	30431.42	0.69	3.33	1.76	442.58	68.94
HC 018	5201.98	19717.78	2.35	4.83	11.75	554.27	281.50
HC 019	10119.14	18659.42	2.70	5.98	24.19	683.54	454.90
HC 020	5946.65	19150.58	3.06	7.14	18.86	777.75	491.42

HC 021	2590.70	39241.20	3.48	14.72	43.92	128.58	102.70
HC 022	2194.43	40623.96	3.55	16.27	48.45	131.25	111.73
HC 023	5878.83	43065.47	3.62	14.34	43.90	121.03	92.50
HC 024	3121.80	43619.78	3.90	16.05	48.11	139.30	111.73
HC 025	6286.06	38666.95	4.71	15.52	23.37	589.08	93.21
HC 026	17065.33	32352.06	3.06	8.79	11.40	7.10	120.75
HC 027	6150.23	22429.11	2.97	10.48	11.18	24.63	3.60
HC 028	5743.27	22966.04	2.97	12.14	9.54	32.81	3.60
HC 029	11983.84	38401.47	2.92	9.49	12.83	396.22	162.32
HC 030	10139.87	22675.91	1.97	7.32	8.23	13.82	144.15
HC 031	10217.47	20068.32	5.15	14.92	23.53	84.59	183.61
HC 032	3454.49	9642.78	3.47	9.26	18.50	744.90	183.61
HC 033	9132.50	18198.33	3.64	8.34	22.24	415.64	210.59
HC 034	5359.07	13756.35	2.47	7.09	13.41	829.13	217.80
HC 035	2322.15	10195.54	3.13	9.05	21.02	143.34	277.03
HC 036	7760.79	18170.37	3.30	9.18	21.00	449.86	243.62
HC 037	686.53	2423.83	2.97	7.81	13.41	894.70	303.62
HC 038	4404.52	10147.67	2.80	9.17	15.97	744.90	183.61
HC 039	9713.32	17342.61	3.13	9.79	28.52	167.49	328.76
HC 040	15555.92	18434.53	3.16	6.49	9.42	803.49	153.58
HC 041	16382.14	19626.18	1.81	1.97	2.86	343.59	144.15
HC 042	28918.91	27114.92	0.72	2.95	0.30	415.34	122.45
HC 043	1931.38	22095.08	3.45	5.58	59.43	358.11	68.09
HC 044	3288.34	12020.84	8.59	5.88	69.84	212.02	411.31
HC 045	3455.12	12536.58	7.78	6.03	67.31	206.48	391.70
HC 046	1020.11	18439.19	1.91	7.76	34.32	675.32	62.61
HC 047	1855.14	18519.85	2.25	7.60	34.30	623.25	57.13
HC 048	2161.78	19102.39	2.25	8.14	37.69	693.01	68.09
HC 049	11948.10	33538.31	5.63	8.14	22.73	145.44	170.75
HC 050	1357.70	25535.78	9.32	9.92	177.62	359.52	370.25
HC 051	2421.37	24566.22	9.89	10.53	188.64	351.12	386.30
HC 052	10567.54	41438.56	4.13	8.79	22.73	146.14	178.26
HC 053	13218.72	39676.03	3.27	5.92	16.02	316.47	65.82
HC 054	6976.61	47375.57	3.61	7.19	16.82	326.21	61.89
HC 055	1480.30	30425.58	6.74	23.43	59.51	444.25	128.31
HC 056	721.79	24082.57	7.69	24.14	51.49	449.11	153.58
HC 057	23824.22	26763.56	1.73	4.74	7.52	11.74	94.16
HC 058	14377.23	19449.41	4.37	9.21	37.25	225.45	126.47
HC 059	12709.36	21784.49	5.80	9.25	57.83	255.13	170.75
HC 060	4281.46	21149.17	3.26	2.52	25.71	269.09	103.54
HC 061	2369.18	27100.24	3.47	2.61	26.39	278.66	103.54
HC 062	7872.37	34615.82	4.02	12.16	25.03	532.74	112.37
HC 063	8476.47	35223.50	3.82	10.25	19.58	458.92	94.71
HC 064	5608.83	21534.04	4.98	17.60	39.79	402.27	94.71

HC 065	5543.24	28330.43	3.47	9.92	24.36	190.33	120.34
HC 066	5399.27	22694.98	3.05	2.59	98.78	254.85	120.34
HC 067	866.35	9917.48	3.75	3.70	82.45	584.19	120.34
HC 068	1357.70	23332.84	3.26	13.09	20.95	63.80	61.89
HC 069	8597.92	43619.14	2.18	6.61	17.46	279.95	65.23
HC 070	2007.77	18831.99	3.52	15.24	19.35	31.48	73.77
HC 071	18378.87	32187.64	2.79	5.71	6.40	5.55	65.23
HC 072	1260.55	17930.78	4.13	17.56	20.87	31.14	73.77
HC 073	14635.96	27135.31	3.04	6.48	6.40	7.55	73.77
HC 074	15937.62	25858.37	2.79	6.29	8.70	8.07	82.30
HC 075	18545.29	25740.62	3.04	6.58	8.70	9.37	82.30
HC 076	9792.44	17318.59	3.77	8.97	40.45	391.68	129.77
HC 077	21807.54	16433.62	13.21	3.86	37.45	187.42	126.43
HC 078	22351.53	16267.19	13.93	4.05	36.69	181.85	116.09
HC 079	9699.91	18145.14	3.77	9.81	50.21	434.43	139.65
HC 080	18511.99	14522.25	12.48	3.62	32.93	183.71	119.51
HC 081	12011.32	18781.34	4.01	9.12	49.46	413.49	139.65
HC 082	10598.69	32938.28	3.28	6.48	16.32	117.05	112.19
HC 083	1212.31	10906.94	2.30	4.44	91.09	788.70	105.27
HC 084	8902.43	40394.31	7.28	12.98	46.46	816.89	97.95
HC 085	11380.89	40238.85	7.65	14.39	51.71	953.47	97.95
HC 086	11632.58	13005.76	4.01	4.42	16.32	122.02	105.27
HC 087	9269.48	35146.91	3.52	7.97	18.60	129.11	115.90
HC 088	17318.13	32151.94	1.57	5.10	4.86	5.20	73.77
HC 089	7842.31	14370.25	3.77	6.73	21.62	661.66	97.95
HC 090	6769.49	14005.30	3.04	5.62	17.08	619.07	90.13
HC 091	10132.62	31243.02	2.79	4.82	14.04	99.66	97.44
HC 092	9269.48	14538.69	3.04	5.88	17.08	600.29	90.13
HC 093	25301.85	36112.27	1.32	4.17	3.30	6.82	64.11
HC 094	4601.70	21356.37	3.77	15.79	22.38	48.54	73.77
HC 095	2419.24	24120.13	4.55	16.22	21.17	150.42	122.45
HC 096	5112.69	22127.62	4.01	15.82	22.38	40.68	65.23
HC 097	4320.66	21681.66	4.01	13.06	16.32	28.59	55.58
HC 098	18575.63	31226.92	1.08	5.06	4.08	5.65	55.58
HC 099	9293.00	13117.03	2.91	6.07	17.84	507.15	158.48
HC 100	4104.43	27730.84	1.57	7.75	17.08	301.50	60.59
HC 101	1932.96	34265.58	1.45	8.06	15.56	312.55	73.77
HC 102	1645.15	35660.12	2.06	7.14	27.65	302.72	73.77
HC 103	3959.12	35117.83	1.88	8.05	19.48	330.51	107.17
HC 104	18439.63	32762.65	4.23	6.73	7.78	8.03	79.66
HC 105	12271.13	40639.18	3.62	11.79	22.55	362.62	80.30
HC 106	7899.81	36975.37	3.62	12.28	22.92	372.18	80.30
HC 107	5487.66	36944.80	3.90	10.73	26.18	347.48	87.58
HC 108	10541.78	49377.74	2.38	6.85	53.73	2101.20	93.02

HC 109	12750.04	32844.25	2.66	10.93	18.47	474.43	203.32
HC 110	7533.67	50632.72	2.24	5.88	44.83	1889.14	82.30
HC 111	10468.27	35512.50	2.38	10.70	15.06	425.46	203.57
HC 112	8412.76	51467.19	2.81	6.59	51.62	2061.85	93.02
HC 113	13070.07	40022.86	3.16	8.36	15.43	327.54	122.45
Subject Cohort ID	**HE4**	**HGF**	**IL-6**	**IL-8**	**Leptin**	**MIF**	**OPN**
OVAR 001	280.35	6.80	0.20	0.30	301.20	7.60	285.30
OVAR 002	208.23	6.80	0.20	0.30	74.59	7.60	285.30
OVAR 003	193.50	6.80	0.20	0.30	137.85	7.60	285.30
OVAR 004	237.09	6.80	0.84	0.30	61.98	7.60	818.88
OVAR 005	1742.56	6.80	0.20	0.30	146.12	7.60	469.98
OVAR 006	193.50	6.80	0.20	0.30	42.80	7.60	285.30
OVAR 007	394.61	6.80	1.56	0.30	58.03	38.61	285.30
OVAR 008	279.38	6.80	1.90	0.30	58.03	10.69	285.30
OVAR 009	397.90	6.80	1.69	0.30	83.26	29.63	453.99
OVAR 010	222.86	6.80	1.40	0.30	70.65	26.56	285.30
OVAR 011	195.52	6.80	1.13	0.30	76.93	8.75	429.34
OVAR 012	193.50	6.80	0.96	0.30	61.98	8.33	471.63
OVAR 013	193.50	11.40	1.04	0.30	187.74	33.44	939.97
OVAR 014	241.35	7.46	1.40	0.30	259.89	9.58	285.30
OVAR 015	193.50	10.17	1.68	0.32	146.93	19.59	678.54
OVAR 016	193.50	6.80	0.20	0.30	233.03	7.60	285.30
OVAR 017	193.50	7.00	0.20	0.39	107.51	9.86	285.30
OVAR 018	193.50	6.80	0.20	0.30	88.55	7.60	285.30
OVAR 019	193.50	6.80	1.00	0.33	86.68	13.16	522.11
OVAR 020	193.50	6.80	0.20	0.30	42.80	7.60	285.30
OVAR 021	193.50	6.80	1.66	0.38	86.68	49.96	285.30
OVAR 022	193.50	6.80	0.81	0.34	120.48	21.77	285.30
OVAR 023	1355.46	14.44	0.68	1.69	54.44	19.12	2509.77
OVAR 024	193.50	6.96	0.84	0.37	252.83	17.09	832.18

OVAR 025	193.50	6.80	0.60	0.30	96.03	27.24	552.18
OVAR 026	193.50	6.80	1.30	0.44	62.69	30.12	469.84
OVAR 027	193.50	8.17	1.70	0.38	1568.37	41.77	319.06
OVAR 028	193.50	10.64	2.12	0.43	467.68	45.13	309.23
OVAR 029	193.50	6.80	1.27	0.30	356.42	20.62	405.23
OVAR 030	193.50	6.80	1.20	0.30	219.35	62.55	285.30
OVAR 031	193.50	6.80	1.21	0.37	174.52	13.46	378.41
OVAR 032	193.50	6.80	0.20	0.30	285.11	7.60	285.30
OVAR 033	389.85	6.80	1.25	0.30	73.12	9.25	808.50
OVAR 034	193.50	6.80	1.02	0.78	63.56	7.60	285.30
OVAR 035	193.50	12.16	1.05	0.92	360.50	23.31	684.10
OVAR 036	193.50	9.01	1.12	1.58	103.33	15.69	898.21
OVAR 037	193.50	6.80	0.86	0.44	62.69	38.45	380.55
OVAR 038	193.50	7.49	0.81	0.37	223.42	78.18	343.81
OVAR 039	551.16	6.80	1.03	0.30	61.98	15.74	876.39
OVAR 040	492.73	6.80	0.20	0.30	74.59	13.72	409.76
OVAR 041	193.50	6.80	1.95	0.53	84.92	14.52	349.64
OVAR 042	1153.06	30.88	0.49	0.64	10644.81	15.60	2180.78
OVAR 043	193.50	6.80	2.15	0.30	84.92	9.30	372.60
OVAR 044	1934.48	30.88	0.54	1.17	3481.39	20.90	1442.19
BLDR 001	431.62	8.57	1.38	0.30	103.43	27.80	2090.48
BLDR 002	193.50	6.80	1.39	0.30	65.51	7.60	285.30
BLDR 003	193.50	6.80	1.21	0.30	77.70	8.39	386.70
BLDR 004	346.07	6.80	1.38	0.30	91.85	7.60	285.30
BLDR 005	255.54	8.54	1.42	0.30	142.78	12.48	1056.83
BLDR 006	431.62	10.65	1.25	0.30	113.56	7.60	347.38
BLDR 007	193.50	10.13	0.20	0.58	214.97	27.30	2487.20
BLDR 008	193.50	6.98	1.97	0.39	135.97	16.32	285.30
BLDR 009	386.70	6.80	1.15	0.30	76.02	7.60	285.30

BLDR 010	281.34	6.80	0.90	0.30	46.75	7.60	644.35
BLDR 011	278.34	6.80	1.21	0.30	65.51	15.53	285.30
BLDR 012	193.50	6.98	2.06	0.30	82.13	11.51	285.30
BLDR 013	193.50	6.80	1.30	0.30	171.89	9.07	285.30
BLDR 014	193.50	6.80	0.20	0.30	42.80	7.60	285.30
BLDR 015	193.50	6.80	1.32	0.35	71.22	56.33	285.30
BLDR 016	193.50	6.80	1.18	0.30	51.98	7.60	285.30
BLDR 017	193.50	6.80	2.11	0.30	82.13	14.11	285.30
BLDR 018	193.50	18.06	1.28	0.35	181.75	33.93	1380.63
BLDR 019	193.50	6.80	1.23	0.30	42.80	10.56	294.20
BLDR 020	454.32	6.80	1.47	0.30	42.80	13.71	376.90
BLDR 021	193.50	8.19	1.09	0.31	71.22	50.88	285.30
BLDR 022	193.50	6.80	0.20	0.30	42.80	7.60	285.30
BLDR 023	193.50	6.80	0.20	0.30	42.80	7.60	285.30
BLDR 024	193.50	6.80	0.20	0.30	42.80	7.60	285.30
BLDR 025	193.50	6.80	0.78	0.30	117.94	15.95	437.60
BLDR 026	193.50	6.80	2.08	0.30	82.13	15.22	285.30
BLDR 027	193.50	6.80	1.30	0.30	71.22	45.16	285.30
BLDR 028	193.50	6.80	1.19	0.30	51.98	14.22	285.30
BLDR 029	193.50	6.80	1.92	0.30	82.13	7.60	285.30
BLDR 030	304.83	6.80	1.45	0.30	57.17	7.60	285.30
BLDR 031	356.49	6.80	1.10	0.30	62.98	13.96	786.33
BLDR 032	193.50	6.80	1.11	0.38	150.76	19.02	475.92
BLDR 033	193.50	8.15	1.42	0.30	70.65	22.21	1018.02
BLDR 034	284.86	6.80	1.37	0.34	70.65	11.42	285.30
BLDR 035	356.32	6.80	1.36	0.30	166.10	40.73	285.30
BLDR 036	193.50	6.80	0.20	0.30	48.22	17.36	285.30
BLDR 037	347.98	6.80	1.53	0.30	73.85	14.60	285.30
BLDR 038	193.50	6.80	1.84	0.43	60.35	7.60	285.30

BLDR 039	284.86	6.80	0.68	0.34	58.03	52.83	285.30
BLDR 040	193.50	6.80	0.20	0.30	42.80	8.32	285.30
BLDR 041	193.50	8.02	1.71	0.43	120.74	54.99	314.07
BLDR 042	193.50	6.80	1.80	0.32	84.92	21.25	285.30
BLDR 043	193.50	6.80	1.95	0.32	42.80	60.78	355.43
BLDR 044	1221.80	34.72	0.54	0.85	11095.72	16.68	2258.22
BLDR 045	1012.82	38.49	0.49	4.49	514.05	74.85	1318.67
BLDR 046	255.54	6.80	1.04	0.30	77.70	7.60	285.30
BLDR 047	267.64	6.80	1.33	0.30	91.50	7.60	363.70
BLDR 048	250.30	6.80	0.77	0.30	105.85	7.60	324.65
PDAC 001	193.50	6.80	0.58	0.30	117.01	9.99	570.18
PDAC 002	193.50	7.67	0.60	0.30	59.21	9.39	340.15
PDAC 003	193.50	34.49	0.96	1.26	1401.29	12.85	8187.94
PDAC 004	254.79	6.80	1.66	0.30	42.80	8.32	285.30
PDAC 005	193.50	6.80	0.20	0.30	96.67	9.32	1310.69
PDAC 006	193.50	6.80	1.36	0.30	96.67	11.00	479.25
PDAC 007	193.50	6.80	0.76	0.30	115.40	7.60	432.08
PDAC 008	245.65	6.80	1.91	0.38	60.73	149.21	285.30
PDAC 009	193.50	6.80	1.49	0.38	76.60	19.96	285.30
PDAC 010	193.50	6.80	1.47	0.30	73.12	7.60	368.03
PDAC 011	193.50	7.38	1.89	0.68	63.56	62.42	459.42
PDAC 012	458.19	6.80	1.23	0.30	157.51	7.61	623.45
PDAC 013	386.36	7.47	1.05	0.30	91.85	7.60	322.92
PDAC 014	222.86	6.80	1.33	0.30	42.80	8.05	285.30
PDAC 015	193.50	8.25	0.32	0.30	63.56	56.84	428.38
PDAC 016	385.28	6.80	1.21	0.34	42.80	16.47	809.09
PDAC 017	498.07	6.80	1.06	0.31	60.73	7.60	426.69
PDAC 018	245.65	11.43	0.97	0.38	83.86	54.90	432.11
PDAC 019	193.50	8.17	1.83	0.33	179.68	41.87	334.83

PDAC 020	409.26	6.80	0.83	0.30	91.85	7.60	684.30
PDAC 021	222.86	6.80	1.64	0.30	42.80	7.60	285.30
PDAC 022	193.50	9.81	0.20	0.30	86.68	16.66	360.61
PDAC 023	193.50	7.67	0.51	0.48	154.06	20.05	1306.18
PDAC 024	193.50	9.23	1.29	0.32	110.97	7.60	389.97
PDAC 025	193.50	6.80	1.56	0.30	110.97	7.60	606.51
PDAC 026	313.34	18.80	1.07	0.87	91.33	7.60	1070.15
PDAC 027	193.50	6.80	0.91	0.30	395.44	13.80	541.33
PDAC 028	193.50	6.80	1.53	0.30	58.03	19.95	285.30
PDAC 029	193.50	6.80	2.48	0.30	42.80	7.60	330.77
PDAC 030	332.61	6.80	0.59	0.30	49.69	39.06	927.26
PDAC 031	193.50	6.80	0.96	0.30	76.93	12.45	744.76
PDAC 032	193.50	6.80	0.64	0.30	175.30	53.11	726.32
PDAC 033	193.50	6.80	1.05	0.30	46.75	13.19	857.86
PDAC 034	241.35	13.28	1.28	0.49	96.21	14.89	1401.40
PDAC 035	193.50	6.80	0.68	0.30	61.98	36.87	285.30
PDAC 036	375.95	6.80	0.20	0.30	57.90	7.60	285.30
PDAC 037	193.50	6.80	0.83	0.30	73.12	17.02	499.93
PDAC 038	208.23	6.80	0.20	0.30	221.70	27.82	285.30
PDAC 039	548.29	6.80	2.85	0.30	57.90	9.15	285.30
PDAC 040	308.27	6.80	0.20	0.30	86.84	9.94	285.30
PDAC 041	193.50	6.80	1.58	0.30	469.83	11.20	314.07
PDAC 042	193.50	6.80	0.87	0.30	125.83	11.98	289.94
PDAC 043	193.50	88.43	1.36	0.30	174.57	13.46	601.05
PDAC 044	193.50	6.80	0.51	0.30	42.80	9.21	519.76
HC 001	504.36	6.80	1.82	0.51	279.32	21.72	285.30
HC 002	193.50	6.80	0.25	0.30	203.92	7.60	285.30
HC 003	388.45	12.93	0.20	0.38	859.65	12.98	285.30
HC 004	791.64	23.04	0.20	0.57	2016.77	11.15	285.30
HC 005	1449.25	10.54	0.20	0.45	510.15	26.20	285.30
HC 006	193.50	7.91	1.20	0.46	330.72	16.28	285.30

HC 007	193.50	19.76	0.20	0.42	850.09	87.87	285.30
HC 008	193.50	6.80	0.20	0.30	920.02	11.20	285.30
HC 009	300.80	6.80	1.38	0.30	91.85	7.60	285.30
HC 010	193.50	6.89	0.20	0.30	276.72	11.31	285.30
HC 011	411.43	6.80	1.07	0.30	125.14	22.53	285.30
HC 012	388.45	6.80	0.20	0.32	42.80	18.66	285.30
HC 013	193.50	6.80	0.20	0.30	207.87	11.31	285.30
HC 014	388.45	6.80	0.20	0.30	111.14	13.72	285.30
HC 015	193.50	6.80	0.20	0.45	138.25	14.50	285.30
HC 016	388.45	6.80	0.20	0.30	165.37	7.60	285.30
HC 017	230.42	6.80	1.32	0.30	91.85	16.90	294.86
HC 018	388.45	6.80	0.20	0.30	138.25	7.60	285.30
HC 019	193.50	6.80	0.20	0.30	111.14	7.60	285.30
HC 020	193.50	6.80	0.20	0.30	111.14	7.60	285.30
HC 021	341.38	6.80	1.56	0.30	49.69	20.60	285.30
HC 022	341.38	6.80	1.44	0.30	80.81	19.79	285.30
HC 023	502.05	6.80	1.52	0.30	83.26	40.52	285.30
HC 024	397.90	6.80	1.88	0.38	70.65	35.98	285.30
HC 025	193.50	6.80	1.75	0.30	152.91	52.81	285.30
HC 026	478.08	6.80	1.62	0.51	203.33	30.36	285.30
HC 027	195622.51	6.80	0.20	6.50	42.80	72.35	285.30
HC 028	193.50	6.80	0.20	0.30	42.80	7.60	285.30
HC 029	193.50	6.80	0.42	0.30	42.80	7.60	285.30
HC 030	193.50	10.31	1.16	0.64	368.06	249.93	337.94
HC 031	193.50	9.18	1.73	0.64	42.80	102.60	285.30
HC 032	193.50	6.80	2.04	0.30	42.80	12.69	285.30
HC 033	1683.04	25.51	1.19	1.07	4547.72	107.08	2011.31
HC 034	193.50	6.80	1.95	0.32	42.80	27.25	285.30
HC 035	193.50	28.94	0.20	2.15	2080.30	51.12	5356.92
HC 036	941.13	24.40	2.36	1.01	6958.75	59.42	1094.64
HC 037	193.50	16.83	2.10	0.74	104.23	226.20	285.30
HC 038	1554.35	32.81	0.52	1.72	3497.02	67.82	1590.85
HC 039	193.50	8.02	1.91	0.43	148.77	61.42	285.30
HC 040	193.50	8.60	2.18	0.50	82.13	48.67	285.30
HC 041	193.50	10.31	1.89	0.64	42.80	106.76	285.30
HC 042	193.50	23.08	2.11	1.48	82.13	216.35	285.30
HC 043	193.50	6.80	0.83	0.66	321.20	14.86	368.73
HC 044	193.50	6.80	0.43	0.66	54.44	23.95	398.95
HC 045	193.50	7.19	0.37	0.49	78.88	47.85	375.56
HC 046	193.50	6.80	0.77	0.30	90.19	13.87	448.33
HC 047	193.50	7.08	0.79	0.30	142.27	24.94	489.91
HC 048	193.50	6.80	0.20	0.30	90.19	18.51	669.68
HC 049	193.50	6.80	0.21	0.30	234.58	13.87	306.55
HC 050	193.50	7.07	0.57	0.30	90.19	35.90	496.43

HC 051	193.50	7.07	0.46	0.30	90.19	14.64	627.93
HC 052	193.50	7.07	0.20	0.30	1516.35	12.20	365.84
HC 053	193.50	7.42	1.58	0.41	109.81	37.10	429.09
HC 054	193.50	7.38	1.79	0.33	109.81	26.60	613.01
HC 055	193.50	9.81	1.72	0.38	139.04	7.60	676.04
HC 056	193.50	6.80	1.73	0.30	82.13	7.60	285.30
HC 057	193.50	11.39	1.85	0.68	536.24	256.10	401.30
HC 058	193.50	6.80	1.33	0.38	63.56	51.15	285.30
HC 059	193.50	10.12	0.20	0.86	88.50	77.44	680.05
HC 060	193.50	7.38	2.12	0.30	63.56	17.68	469.49
HC 061	193.50	7.65	1.73	0.32	136.51	11.66	883.69
HC 062	193.50	6.80	1.24	0.36	62.69	26.14	327.61
HC 063	193.50	6.80	1.57	0.44	42.80	17.75	331.34
HC 064	193.50	10.18	0.92	0.40	142.96	79.45	866.11
HC 065	193.50	6.80	0.20	0.30	42.80	7.60	285.30
HC 066	193.50	6.80	0.20	0.30	42.80	7.60	285.30
HC 067	193.50	19.33	1.34	1.58	135.75	9.50	631.47
HC 068	193.50	10.79	1.48	0.36	167.85	38.85	992.32
HC 069	337.32	6.80	1.05	0.30	85.64	12.04	341.45
HC 070	350.95	6.80	1.10	0.30	47.66	10.87	418.02
HC 071	193.50	6.80	0.83	0.30	42.80	7.60	285.30
HC 072	250.80	7.79	1.24	0.30	153.39	7.60	1006.11
HC 073	193.50	6.80	0.90	0.30	46.50	7.60	315.42
HC 074	193.50	6.80	0.89	0.30	68.89	9.84	285.30
HC 075	193.50	6.80	0.94	0.30	143.53	24.61	285.30
HC 076	436.14	6.80	0.79	0.30	66.65	14.37	487.16
HC 077	193.50	6.80	0.58	0.30	42.80	13.58	285.30
HC 078	193.50	6.80	0.67	0.30	42.80	13.02	285.30
HC 079	267.54	6.80	0.87	0.30	47.66	8.60	285.30
HC 080	239.77	6.80	0.20	0.30	82.99	9.95	285.30
HC 081	193.50	6.80	0.89	0.30	47.66	10.58	285.30
HC 082	193.50	6.80	0.94	0.30	46.50	8.26	285.30
HC 083	193.50	6.80	1.26	0.30	47.66	7.60	300.23
HC 084	334.86	8.78	0.71	0.34	99.11	30.99	892.64
HC 085	193.50	6.80	1.03	0.30	61.98	7.60	303.26
HC 086	250.80	8.78	0.20	0.30	112.58	18.51	719.37
HC 087	193.50	6.80	0.81	0.30	117.87	7.60	285.30
HC 088	193.50	6.80	0.87	0.30	62.54	7.60	285.30
HC 089	272.80	6.80	0.98	0.30	47.66	11.46	472.08
HC 090	193.50	7.28	0.78	0.30	47.66	26.63	348.93
HC 091	193.50	6.80	0.20	0.30	163.12	7.60	285.30
HC 092	204.91	8.28	1.02	0.30	47.66	38.50	410.07
HC 093	193.50	6.80	0.37	0.30	381.32	7.60	285.30
HC 094	250.80	6.80	1.10	0.30	91.26	7.82	588.36

HC 095	193.50	6.80	2.15	0.30	82.13	11.81	285.30
HC 096	193.50	6.80	1.28	0.30	125.14	20.09	285.30
HC 097	193.50	6.80	1.20	0.30	63.55	11.38	285.30
HC 098	193.50	6.80	0.30	0.30	236.29	7.60	285.30
HC 099	419.57	6.80	1.12	0.30	91.85	20.81	497.77
HC 100	193.50	6.80	0.54	0.30	358.20	7.60	285.30
HC 101	890.32	23.78	0.20	2.70	15473.75	11.65	3124.31
HC 102	482.62	23.78	0.20	1.76	4538.78	7.60	1845.75
HC 103	302.92	6.80	0.20	0.30	183.74	14.35	285.30
HC 104	193.50	6.80	0.33	0.30	79.09	7.60	285.30
HC 105	193.50	6.80	0.20	0.30	42.80	7.60	285.30
HC 106	193.50	6.80	0.20	0.30	48.22	7.60	285.30
HC 107	193.50	6.80	0.20	0.30	42.80	7.60	285.30
HC 108	193.50	6.80	0.20	0.30	60.89	7.60	285.30
HC 109	193.50	14.29	0.20	0.30	206.70	9.00	390.43
HC 110	193.50	6.80	0.20	0.42	212.76	7.60	285.30
HC 111	193.50	6.80	0.20	0.30	79.09	7.60	285.30
HC 112	193.50	6.80	0.39	0.30	42.80	7.60	285.30
HC 113	193.50	6.80	1.82	0.30	82.13	8.93	285.30
OVAR 001	193.50	155.76	0.20	4.77	76237.44	78.05	6132.67
OVAR 002	193.50	134.81	0.20	6.05	16753.57	31.88	23852.13
OVAR 003	193.50	143.22	9.65	10.47	80016.99	37.70	21592.77
OVAR 004	193.50	103.43	0.20	0.30	8419.01	30.79	34512.47
OVAR 005	193.50	168.17	0.20	5.53	26233.08	75.43	41891.24
OVAR 006	609.62	88.78	0.20	0.30	6950.70	43.12	21953.42
OVAR 007	193.50	129.89	0.20	1.92	24238.25	57.84	18143.91
OVAR 008	3322.37	286.56	0.20	9.04	18670.50	591.79	37375.72
OVAR 009	5240.70	195.55	10.07	3.13	1500.63	395.93	70876.96
OVAR 010	311.59	132.23	0.20	3.46	18914.12	132.81	32426.96
OVAR 011	938.70	350.84	24.86	11.30	10261.75	56.50	12427.41
OVAR 012	5369.04	151.12	1.66	12.37	28318.67	54.23	58992.28
OVAR 013	193.50	251.68	2.14	5.47	16561.48	76.94	47899.40
OVAR 014	4409.66	615.54	0.20	4.14	43221.86	52.20	31677.71
OVAR 015	9963.20	255.39	4.13	17.54	19872.74	39.82	51484.30
OVAR 016	4742.23	545.38	3.37	22.56	77981.73	80.78	76705.22

OVAR 017	28140.49	777.93	22.74	33.84	9618.29	57.47	63821.59
OVAR 018	6119.77	439.43	0.20	10.31	30230.46	67.25	41397.08
OVAR 019	193.50	139.62	1.82	6.53	12514.75	30.84	18046.16
OVAR 020	24968.04	459.37	0.20	19.27	41437.14	59.55	125847.33
OVAR 021	2033.54	190.14	1.36	4.68	22291.92	55.03	10533.02
OVAR 022	882.39	122.33	0.20	6.36	21715.14	92.84	14170.51
OVAR 023	284029.96	821.75	66.56	100.61	2809.79	127.96	93632.78
OVAR 024	2628.40	110.79	0.20	2.68	46212.59	64.78	19339.80
OVAR 025	5717.16	98.89	0.20	3.97	2186.61	154.63	54812.22
OVAR 026	24688.27	122.79	0.20	10.86	9258.60	60.85	50825.84
OVAR 027	193.50	146.13	2.90	5.61	70794.13	61.58	10904.98
OVAR 028	193.50	106.55	1.37	2.13	20852.77	52.05	3267.80
OVAR 029	2886.32	213.74	2.18	10.43	71197.93	37.06	58668.63
OVAR 030	193.50	78.78	0.20	10.67	51820.51	92.01	2836.08
OVAR 031	8283.49	215.55	3.72	5.19	26409.23	99.55	17724.56
OVAR 032	16428.04	548.57	48.73	32.20	370132.66	68.27	49903.68
OVAR 033	1766.02	108.96	0.20	3.49	6572.20	32.96	47862.24
OVAR 034	193.50	109.90	0.20	31.37	1534.98	24.63	13462.38
OVAR 035	5326.94	288.92	16.60	44.62	20830.46	206.71	30290.76
OVAR 036	19787.17	468.37	28.94	51.25	7750.10	76.93	40337.62
OVAR 037	3819.68	208.87	1.63	13.20	7103.26	70.13	36054.38
OVAR 038	8572.63	173.00	0.20	5.65	5570.83	76.40	12553.53
OVAR 039	938.70	114.25	3.31	2.62	33166.71	38.82	3815.64
OVAR 040	193.50	236.99	4.76	29.88	2093.46	37.06	47329.23
OVAR 041	193.50	213.99	2.52	3.82	23958.72	77.24	13123.55
OVAR 042	193.50	137.99	0.20	6.39	29173.32	89.29	22987.87
OVAR 043	21317.49	566.03	38.93	27.63	8990.10	46.47	53781.07
OVAR 044	193.50	196.84	0.20	4.46	49816.08	51.17	20985.37
BLDR 001	193.50	230.65	6.24	4.61	4176.50	188.41	79933.27

BLDR 002	193.50	232.72	0.20	5.28	9722.75	92.46	23759.83
BLDR 003	193.50	121.94	0.20	0.30	6947.85	185.31	49110.19
BLDR 004	193.50	142.67	0.20	2.79	9810.34	61.52	3358.92
BLDR 005	193.50	422.71	0.20	2.07	15054.78	97.49	31057.36
BLDR 006	193.50	214.97	0.20	0.68	9954.29	57.92	35086.51
BLDR 007	34265.57	207.31	0.20	13.30	5990.50	39.25	67354.89
BLDR 008	193.50	318.09	4.53	10.81	25042.98	129.65	19710.73
BLDR 009	193.50	126.34	0.20	2.53	731.16	20.94	21071.94
BLDR 010	938.70	86.95	0.20	2.05	3704.22	178.19	28456.23
BLDR 011	193.50	295.96	4.25	3.27	6297.23	124.66	22497.69
BLDR 012	193.50	201.17	8.51	3.69	7204.22	52.66	29569.52
BLDR 013	212.53	218.06	1.17	2.83	36055.14	115.89	22619.14
BLDR 014	193.50	88.84	0.20	1.46	1911.19	18.47	951.10
BLDR 015	193.50	176.46	0.20	5.34	3831.07	229.42	30835.53
BLDR 016	193.50	142.84	0.20	2.20	3456.32	25.77	29593.56
BLDR 017	193.50	154.51	3.30	5.00	15177.11	220.42	3017.92
BLDR 018	193.50	272.17	0.64	5.46	9601.99	108.11	31661.90
BLDR 019	193.50	301.29	0.20	1.81	16310.59	111.72	52393.46
BLDR 020	1466.16	267.45	0.20	1.81	16160.73	133.46	46967.26
BLDR 021	193.50	149.76	0.20	3.94	1874.38	100.74	12019.08
BLDR 022	193.50	158.09	0.98	1.76	23801.73	105.88	3222.94
BLDR 023	193.50	143.02	0.20	2.37	3046.01	19.09	10968.21
BLDR 024	193.50	143.02	0.20	2.30	1000.89	23.40	8122.80
BLDR 025	193.50	139.50	0.20	2.31	28789.39	45.90	2939.42
BLDR 026	193.50	138.45	0.20	8.89	3068.22	131.19	4169.73
BLDR 027	193.50	209.08	0.20	5.34	20344.22	149.91	14415.93
BLDR 028	193.50	247.32	7.77	9.10	22018.09	66.96	45722.13
BLDR 029	1403.45	346.11	5.43	10.81	46776.69	135.03	48108.45
BLDR 030	193.50	130.59	0.20	8.63	1240.44	36.41	44376.20

BLDR 031	193.50	317.29	0.20	10.47	1240.44	140.83	48745.34
BLDR 032	193.50	186.33	1.72	5.34	6288.45	105.13	15841.98
BLDR 033	466.98	155.90	0.20	1.60	1974.15	21.65	26970.10
BLDR 034	193.50	56.32	0.20	3.13	4289.49	99.86	30053.38
BLDR 035	193.50	433.08	0.20	27.65	65490.07	96.38	30177.35
BLDR 036	193.50	135.63	0.20	2.24	15785.24	96.63	11419.97
BLDR 037	1709.19	202.20	0.20	4.33	2671.22	149.70	51234.80
BLDR 038	193.50	340.22	0.20	15.57	2208.33	302.83	52849.42
BLDR 039	193.50	217.49	0.20	1.64	13588.82	27.93	64298.20
BLDR 040	193.50	66.66	0.20	4.49	18082.77	51.87	16358.88
BLDR 041	193.50	137.99	0.20	4.46	13993.49	62.68	44882.59
BLDR 042	193.50	275.36	0.20	14.91	7871.61	117.04	41380.16
BLDR 043	193.50	230.94	2.23	5.10	1163.48	220.59	43675.03
BLDR 044	193.50	219.66	0.20	5.10	6026.27	188.71	28642.70
BLDR 045	193.50	185.29	0.20	5.10	1671.11	117.04	25505.70
BLDR 046	2850.42	157.34	0.20	0.35	6537.00	67.91	13752.53
BLDR 047	212.53	161.28	0.20	1.77	2142.33	66.51	45177.97
BLDR 048	907.66	139.40	0.20	1.36	12526.85	24.73	24007.02
PDAC 001	882.39	144.49	0.20	8.61	17116.95	67.03	13311.33
PDAC 002	5326.94	239.21	0.20	8.61	7497.21	52.12	30086.62
PDAC 003	1619.96	321.51	0.20	4.58	11411.48	41.22	27668.87
PDAC 004	193.50	134.65	3.02	10.51	2186.34	19.42	84276.76
PDAC 005	2691.70	110.79	0.20	5.77	6988.24	80.16	24755.19
PDAC 006	4072.25	220.35	37.50	9.70	4265.84	60.25	37878.29
PDAC 007	7537.41	248.28	17.82	16.12	2623.90	69.25	42550.33
PDAC 008	193.50	126.98	1.03	6.54	2354.43	43.03	17453.90
PDAC 009	9496.12	168.37	2.15	5.84	13280.20	49.66	12756.52
PDAC 010	193.50	248.72	0.20	2.36	8690.57	66.51	285191.54
PDAC 011	193.50	183.11	2.79	16.91	751.81	33.81	34672.20

PDAC 012	938.70	119.63	0.20	2.05	12552.75	48.89	5571.91
PDAC 013	193.50	361.41	0.20	3.51	6364.15	21.42	3577.03
PDAC 014	875.10	113.10	0.20	7.15	3310.68	43.12	31263.39
PDAC 015	193.50	200.09	0.20	5.70	11912.41	46.54	27659.35
PDAC 016	193.50	172.28	0.20	7.72	4289.92	60.75	47750.03
PDAC 017	656.44	129.52	0.20	4.81	1256.65	39.01	34287.11
PDAC 018	347.77	236.17	2.63	6.02	1913.68	54.17	49543.72
PDAC 019	193.50	256.17	1.91	8.84	34516.60	40.62	34262.86
PDAC 020	193.50	176.23	0.20	7.79	1070.73	55.01	90671.47
PDAC 021	1438.60	141.77	0.20	4.95	3589.65	45.22	50337.71
PDAC 022	193.50	139.67	0.20	3.76	3270.68	38.80	2284.29
PDAC 023	193.50	148.27	0.20	7.47	6738.79	43.33	44559.58
PDAC 024	193.50	142.99	0.20	13.70	2640.47	36.56	44878.79
PDAC 025	193.50	205.84	7.17	10.04	1289.84	29.44	31332.78
PDAC 026	965.11	646.28	10.07	50.63	2544.81	99.55	58628.42
PDAC 027	193.50	156.46	0.20	4.88	31045.96	54.52	2814.21
PDAC 028	907.66	291.04	0.20	12.18	4460.52	38.70	64379.59
PDAC 029	907.66	160.62	5.47	2.97	1562.48	30.38	55430.38
PDAC 030	311.59	161.81	0.20	3.62	2871.31	64.99	81997.71
PDAC 031	7440.49	155.19	0.20	1.64	1640.14	56.95	34430.14
PDAC 032	193.50	122.30	0.20	0.77	7404.74	25.00	43136.08
PDAC 033	2009.16	140.83	0.20	1.72	16875.85	73.52	30915.42
PDAC 034	193.50	156.49	0.20	2.62	3000.81	35.56	33577.10
PDAC 035	193.50	132.93	0.20	1.89	2181.39	37.43	25026.26
PDAC 036	193.50	91.80	17.09	5.79	1999.75	39.00	49795.07
PDAC 037	1153.98	184.41	0.20	6.54	2394.10	69.21	128617.60
PDAC 038	193.50	151.59	0.20	4.39	44459.35	33.18	57863.83
PDAC 039	193.50	206.92	0.20	9.42	3246.38	73.47	16731.81
PDAC 040	193.50	151.59	0.20	4.02	7537.63	29.63	14187.08

PDAC 041	193.50	219.66	0.20	12.93	4786.12	158.40	28853.77
PDAC 042	193.50	137.16	0.20	1.26	26947.84	44.02	50631.29
PDAC 043	193.50	416.40	0.20	1.56	9258.33	52.04	43026.56
PDAC 044	8625.46	282.37	1.46	20.49	3509.84	99.04	32345.74
HC 001	1075.83	380.36	0.20	12.90	49293.75	167.09	64492.81
HC 002	193.50	268.32	0.20	10.22	34668.23	121.04	19350.51
HC 003	6312.99	462.63	0.20	12.41	113624.89	136.06	6679.56
HC 004	6814.59	433.77	0.20	10.38	107105.88	112.90	5793.65
HC 005	2339.12	301.23	0.20	4.25	60030.73	185.06	38786.06
HC 006	193.50	338.46	0.20	6.82	77141.70	23.51	24773.20
HC 007	193.50	208.91	0.20	5.53	122618.86	146.44	4689.22
HC 008	5280.62	202.14	0.20	5.19	148686.73	45.46	1326.47
HC 009	957.02	117.47	0.20	1.90	4277.99	59.84	2955.77
HC 010	4178.06	202.14	0.20	4.83	145792.10	43.72	1281.37
HC 011	648.39	127.89	0.20	1.72	4277.35	57.44	3264.34
HC 012	4178.06	176.81	0.20	4.83	31243.77	56.89	1183.90
HC 013	4178.06	176.92	0.20	5.19	34220.16	48.87	1348.45
HC 014	3540.26	170.56	0.20	4.12	32285.84	50.90	1235.66
HC 015	2330.69	157.74	0.20	3.76	31280.62	49.56	1118.67
HC 016	11503.18	308.32	0.20	10.71	46447.63	65.31	8366.25
HC 017	193.50	163.17	9.09	0.30	1904.02	77.41	3068.32
HC 018	8634.89	212.79	0.20	8.98	33859.83	66.25	6007.83
HC 019	9800.19	316.78	0.20	13.73	42227.51	68.49	7582.62
HC 020	11984.00	335.47	0.20	16.76	45837.48	84.54	8942.86
HC 021	1153.98	267.45	0.20	3.49	29979.45	148.16	29588.04
HC 022	1153.98	298.16	0.20	4.63	31832.24	216.45	34502.55
HC 023	1153.98	273.26	0.20	4.25	30924.65	135.45	31111.18
HC 024	1153.98	299.77	0.20	5.01	31317.10	206.42	34888.67
HC 025	957.02	183.45	0.20	1.90	12511.66	100.15	2082.72
HC 026	1153.98	468.50	0.20	12.40	88542.06	175.67	57650.90
HC 027	193.50	150.40	0.20	7.51	12866.97	28.08	19686.83
HC 028	193.50	113.47	0.20	6.33	13682.20	29.77	1761.42
HC 029	193.50	125.78	0.20	4.09	11059.61	26.05	7880.84
HC 030	193.50	318.80	0.20	8.99	66245.04	125.42	20553.70
HC 031	193.50	242.15	0.20	11.61	16035.38	190.72	38300.51
HC 032	193.50	150.01	0.20	7.04	4479.11	64.95	8867.73
HC 033	4309.16	229.02	0.20	8.02	51663.50	89.77	10163.26
HC 034	12345.68	230.94	4.08	7.04	23958.72	123.33	7013.31
HC 035	193.50	208.29	2.38	5.10	74829.78	69.45	1661.24
HC 036	193.50	189.56	0.20	6.07	42093.69	69.14	5734.95
HC 037	13075.35	275.36	2.66	8.34	25388.29	142.00	8000.22
HC 038	193.50	125.83	0.20	7.04	4290.00	67.20	1425.70

HC 039	193.50	264.36	2.95	7.04	84965.21	89.29	11046.18
HC 040	5265.37	216.31	3.61	8.24	26386.07	152.44	7149.00
HC 041	193.50	350.85	0.20	31.69	3867.87	426.10	7956.16
HC 042	193.50	231.27	0.20	27.84	4026.61	228.13	2125.74
HC 043	2155.83	229.78	0.20	23.55	84174.39	252.09	30973.80
HC 044	13820.27	369.39	12.08	24.92	5415.97	355.88	18550.86
HC 045	12479.31	361.37	11.07	16.37	5419.36	351.08	18882.38
HC 046	1619.96	98.89	0.20	3.65	24487.49	85.50	24891.51
HC 047	882.39	92.83	0.20	3.32	24401.93	57.95	23288.80
HC 048	2155.83	110.79	0.20	3.97	25434.07	86.54	26293.13
HC 049	7912.17	344.66	1.70	28.58	102717.04	461.38	8670.96
HC 050	12778.90	348.95	10.95	23.55	3698.41	119.14	26333.33
HC 051	13365.85	327.63	11.04	17.83	3711.18	111.15	25948.64
HC 052	7570.19	310.77	2.15	7.48	77638.92	117.17	9064.89
HC 053	193.50	99.29	0.20	2.68	767.89	24.35	18280.16
HC 054	193.50	97.96	0.20	2.83	983.93	30.22	6017.81
HC 055	193.50	177.77	2.47	4.68	5353.93	41.23	24296.26
HC 056	193.50	122.07	1.72	3.69	5645.50	60.09	3783.26
HC 057	193.50	224.48	2.15	8.96	32788.98	98.83	18873.01
HC 058	193.50	199.68	0.20	5.41	5037.95	49.07	20618.01
HC 059	9458.00	284.55	2.47	11.29	6315.49	116.18	20079.85
HC 060	193.50	109.94	0.80	3.76	4190.52	46.66	21064.72
HC 061	193.50	109.94	0.80	3.53	4301.60	41.23	20883.72
HC 062	193.50	199.38	0.20	10.90	3425.84	99.55	21982.31
HC 063	193.50	171.52	0.20	11.36	3170.25	86.22	20577.80
HC 064	193.50	113.29	0.20	3.76	4379.29	56.23	20135.41
HC 065	193.50	232.58	0.20	9.53	2422.82	70.43	16598.82
HC 066	193.50	146.13	2.79	6.07	1784.49	47.86	25716.31
HC 067	193.50	460.51	1.93	49.44	2597.00	15.15	12299.79
HC 068	193.50	196.32	0.20	16.41	7575.81	58.02	23646.86
HC 069	193.50	221.51	0.20	3.40	1430.29	31.64	41153.71
HC 070	193.50	213.56	0.20	8.73	8144.68	33.65	25503.08
HC 071	193.50	283.79	0.20	4.86	23377.32	39.62	14689.23
HC 072	193.50	193.29	0.20	9.33	8818.71	35.63	24956.86
HC 073	193.50	321.54	0.20	6.04	31856.42	44.24	14864.20
HC 074	193.50	347.99	0.20	8.43	28546.48	48.20	16150.96
HC 075	193.50	314.24	0.20	7.83	25483.09	47.55	16394.19
HC 076	193.50	173.08	0.20	16.33	2145.92	32.31	21902.24
HC 077	193.50	468.26	0.20	20.95	24293.41	38.30	13544.66
HC 078	193.50	453.93	0.20	22.81	22668.70	34.31	5750.89
HC 079	193.50	177.24	0.20	10.54	2086.91	35.64	26013.43
HC 080	193.50	457.51	0.20	26.54	22294.16	42.27	12587.87
HC 081	193.50	164.90	0.20	10.24	2185.35	38.30	24957.09
HC 082	193.50	335.75	0.20	17.57	101133.24	48.81	6934.27

HC 083	193.50	737.94	0.20	61.73	3594.75	16.04	20582.76
HC 084	193.50	217.46	0.20	15.11	3556.87	78.09	19362.12
HC 085	193.50	245.13	0.20	17.87	3703.81	101.17	21702.08
HC 086	193.50	252.93	0.20	8.88	2086.91	61.27	28971.64
HC 087	193.50	241.22	0.20	3.39	81687.13	34.31	8655.32
HC 088	193.50	247.08	0.20	5.60	65695.99	56.06	11367.08
HC 089	193.50	295.16	0.20	13.27	2165.80	50.17	15333.57
HC 090	193.50	247.06	0.20	10.84	2127.02	58.01	14136.89
HC 091	193.50	366.42	0.20	12.05	102699.13	65.81	8195.40
HC 092	193.50	268.44	0.20	15.41	2127.02	75.84	14184.44
HC 093	193.50	259.52	0.20	9.65	32290.20	59.27	12523.11
HC 094	193.50	189.40	0.20	7.53	12715.45	52.79	17335.84
HC 095	193.50	162.44	4.53	8.57	11146.84	156.92	2089.91
HC 096	193.50	205.57	0.20	7.53	11916.05	47.54	17467.22
HC 097	193.50	185.17	0.20	8.43	13654.63	54.08	19644.40
HC 098	193.50	254.42	0.20	9.34	41233.67	67.71	10500.00
HC 099	193.50	213.56	0.20	20.18	2492.14	286.43	13976.74
HC 100	193.50	109.74	0.20	3.10	33734.50	93.50	10985.22
HC 101	193.50	87.37	0.20	2.53	29093.35	62.56	14036.41
HC 102	193.50	78.25	0.20	2.53	33492.34	49.48	13060.64
HC 103	193.50	109.05	0.20	3.67	31050.04	84.82	13907.26
HC 104	193.50	132.96	0.20	4.63	41382.30	37.35	12717.11
HC 105	193.50	169.36	0.20	1.99	1378.44	40.32	74421.56
HC 106	193.50	187.59	0.20	2.18	1372.00	43.04	76024.43
HC 107	193.50	144.03	0.20	1.62	1378.44	31.38	60080.59
HC 108	193.50	204.91	0.20	21.55	11707.60	100.98	14164.21
HC 109	193.50	217.00	0.20	8.37	7474.02	68.90	19828.17
HC 110	193.50	176.36	0.20	13.67	11294.28	78.70	14201.67
HC 111	193.50	200.86	0.20	6.56	6972.48	72.82	18895.22
HC 112	193.50	200.86	0.20	17.04	11617.21	102.95	15274.37
HC 113	193.50	130.30	0.20	5.00	1558.31	97.93	7192.64
Subject Cohort ID	**Prolactin**	**SCF**	**TNFa**	**TRAIL**	**Total PSA**	**VEGF**	**b-HCG**
OVAR 001	36.93	2.00	0.30	0.50	2.00	6.40	0.03
OVAR 002	30.20	2.00	0.30	0.50	2.00	6.40	0.03
OVAR 003	30.20	2.00	0.30	0.50	2.00	6.40	0.03
OVAR 004	30.20	2.00	0.51	0.61	2.51	8.95	0.04
OVAR 005	39.50	2.00	0.30	0.50	2.21	6.40	0.03
OVAR 006	39.14	2.00	0.30	0.50	2.00	6.40	0.03
OVAR 007	30.20	2.00	0.58	0.50	2.00	22.67	0.03

OVAR 008	30.20	3.33	0.47	0.50	2.21	14.97	0.03
OVAR 009	82.53	2.00	0.30	0.50	2.00	18.43	0.09
OVAR 010	39.39	2.00	0.35	1.92	2.00	14.51	0.03
OVAR 011	49.79	2.00	0.30	0.61	2.01	9.58	0.04
OVAR 012	32.38	2.00	0.80	0.61	2.31	10.12	0.04
OVAR 013	61.15	3.24	0.83	1.45	2.00	6.40	0.07
OVAR 014	179.45	2.03	0.94	1.54	2.00	13.20	0.03
OVAR 015	54.69	2.10	0.77	0.50	2.00	10.34	0.06
OVAR 016	44.50	2.00	0.77	0.65	2.35	6.40	0.03
OVAR 017	96.72	2.00	0.30	0.77	2.00	6.40	0.03
OVAR 018	46.56	4.02	0.30	0.89	2.00	6.40	0.03
OVAR 019	160.56	2.01	0.58	1.18	2.00	14.09	0.03
OVAR 020	30.20	2.00	0.30	0.50	2.00	6.40	0.03
OVAR 021	30.20	2.00	0.42	0.50	2.00	11.80	0.05
OVAR 022	38.08	2.00	0.30	1.73	2.00	26.18	0.03
OVAR 023	129.90	2.75	1.22	1.37	2.02	8.51	0.04
OVAR 024	85.71	2.00	0.82	1.66	2.00	21.14	0.03
OVAR 025	78.01	2.00	1.04	1.01	2.00	14.49	0.03
OVAR 026	30.20	2.10	0.81	0.82	2.00	9.58	0.03
OVAR 027	116.32	5.50	0.53	4.99	2.00	10.86	0.05
OVAR 028	240.25	5.50	0.53	2.51	2.00	15.83	0.07
OVAR 029	57.26	2.00	0.41	1.51	2.37	10.20	0.06
OVAR 030	30.20	2.01	0.30	1.56	2.00	13.06	0.03
OVAR 031	104.65	2.75	0.50	2.08	2.00	14.90	0.06
OVAR 032	43.75	2.00	0.30	0.50	2.00	6.40	0.03
OVAR 033	43.96	2.18	2.14	0.63	5.91	6.40	0.03
OVAR 034	30.20	2.00	0.30	0.50	2.00	6.40	0.03
OVAR 035	129.77	2.78	0.98	2.43	2.06	27.40	0.04
OVAR 036	112.38	2.00	1.48	1.19	2.00	15.92	0.03

OVAR 037	83.06	2.10	0.38	0.66	2.00	6.40	0.03
OVAR 038	306.63	2.22	0.82	1.84	2.00	12.72	0.03
OVAR 039	48.72	2.00	1.67	0.61	2.14	6.40	0.04
OVAR 040	89.65	2.00	0.30	0.50	2.00	6.40	0.03
OVAR 041	30.20	2.47	0.91	0.50	3.08	19.47	0.03
OVAR 042	1278.95	22.94	2.26	24.72	2.59	6.40	0.15
OVAR 043	30.20	2.47	0.66	0.50	3.32	21.01	0.03
OVAR 044	792.52	16.30	2.26	20.29	2.10	6.40	0.18
BLDR 001	104.79	2.88	1.26	1.13	16.91	13.41	0.03
BLDR 002	30.20	2.00	0.30	0.63	2.00	8.47	0.03
BLDR 003	35.01	2.25	0.89	0.80	12.29	6.40	0.03
BLDR 004	30.20	2.00	1.02	0.50	2.00	16.44	0.08
BLDR 005	49.04	8.89	0.91	1.37	24.47	14.45	0.03
BLDR 006	45.05	2.25	0.30	1.29	2.00	8.90	0.03
BLDR 007	256.31	4.87	0.91	2.07	2.00	6.40	0.09
BLDR 008	268.49	3.64	0.30	1.40	2.00	6.40	0.06
BLDR 009	94.68	2.00	1.70	1.22	32.99	7.53	0.05
BLDR 010	98.80	2.00	0.65	0.74	10.71	10.12	0.03
BLDR 011	144.44	2.00	0.30	0.50	2.17	9.08	0.03
BLDR 012	326.62	3.64	0.30	2.30	2.00	14.06	0.06
BLDR 013	71.10	5.64	0.78	1.71	10.76	9.96	0.03
BLDR 014	63.30	2.00	0.86	0.77	4.94	6.40	0.03
BLDR 015	51.22	2.49	1.62	1.53	6.50	15.40	0.03
BLDR 016	30.20	2.00	0.62	0.50	2.00	11.38	0.03
BLDR 017	30.20	2.00	0.33	0.95	3.90	14.06	0.06
BLDR 018	214.83	5.26	0.93	3.87	81.56	6.40	0.05
BLDR 019	138.63	2.00	0.30	0.58	2.00	14.76	0.03
BLDR 020	34.25	2.00	0.30	0.77	8.85	17.19	0.07
BLDR 021	95.38	3.30	0.91	1.71	22.15	10.44	0.05

BLDR 022	30.20	2.00	0.30	0.50	5.28	6.40	0.03
BLDR 023	30.20	2.00	0.30	0.50	2.19	6.40	0.03
BLDR 024	30.20	2.00	0.30	0.50	2.00	6.40	0.03
BLDR 025	360.20	2.00	0.58	0.99	2.00	13.43	0.03
BLDR 026	44.53	2.67	0.30	0.95	2.00	17.95	0.06
BLDR 027	30.20	2.00	0.54	0.64	3.24	9.71	0.03
BLDR 028	30.20	2.00	0.58	0.50	2.00	13.43	0.03
BLDR 029	30.20	2.00	0.30	0.50	6.80	17.01	0.03
BLDR 030	48.14	2.00	4.23	0.63	5.01	16.98	0.03
BLDR 031	90.99	3.22	0.50	1.14	23.82	7.90	0.03
BLDR 032	109.85	2.81	0.30	1.92	2.00	23.13	0.24
BLDR 033	308.80	5.37	0.30	2.09	2.00	9.08	0.11
BLDR 034	30.20	2.00	2.93	0.50	6.27	13.18	0.04
BLDR 035	43.38	2.00	0.30	0.50	5.17	18.24	0.03
BLDR 036	30.20	2.00	0.30	0.65	6.96	6.40	0.03
BLDR 037	31.65	2.00	0.87	0.50	2.57	15.48	0.03
BLDR 038	30.20	3.68	0.79	0.50	2.00	16.81	0.03
BLDR 039	201.20	2.91	0.30	1.12	323.29	7.15	0.03
BLDR 040	30.20	2.00	1.59	0.50	4.42	7.99	0.03
BLDR 041	675.17	2.47	0.30	0.95	2.71	13.40	0.03
BLDR 042	30.20	2.47	0.53	0.95	7.36	15.71	0.03
BLDR 043	30.20	2.47	0.30	0.50	3.32	16.81	0.03
BLDR 044	1289.08	22.94	2.38	24.50	3.82	6.40	0.15
BLDR 045	1395.31	11.80	2.26	14.06	146.24	9.62	0.05
BLDR 046	73.04	2.10	0.30	0.50	2.00	7.43	0.03
BLDR 047	35.00	2.00	2.07	0.77	7.40	13.76	0.42
BLDR 048	190.34	2.00	3.41	1.07	4.16	6.40	0.03
PDAC 001	248.11	2.00	1.05	2.45	2.00	6.40	0.03
PDAC 002	337.83	2.00	0.71	0.84	2.00	19.43	0.03

PDAC 003	13410.77	12.89	2.42	16.35	2.00	17.86	0.30
PDAC 004	30.58	5.57	0.30	0.50	2.00	13.74	0.03
PDAC 005	791.59	2.00	1.42	1.54	2.00	6.40	0.03
PDAC 006	728.67	2.00	1.67	1.54	2.00	21.20	0.03
PDAC 007	175.88	2.00	0.51	1.42	2.00	20.88	0.03
PDAC 008	523.10	5.03	0.58	2.33	2.00	13.80	0.03
PDAC 009	143.78	2.47	0.58	0.50	2.00	7.07	0.05
PDAC 010	492.44	2.00	0.41	0.50	2.00	12.80	0.03
PDAC 011	237.77	2.01	0.97	0.50	16.49	14.56	0.03
PDAC 012	725.60	3.00	6.64	1.54	2.11	17.05	0.03
PDAC 013	1425.00	2.00	1.83	0.80	2.72	11.28	0.03
PDAC 014	444.46	2.00	0.30	0.88	2.00	12.13	0.03
PDAC 015	198.10	2.01	0.63	1.56	2.00	6.40	0.05
PDAC 016	145.09	2.00	1.60	0.88	8.14	12.66	0.03
PDAC 017	122.99	6.24	0.47	2.71	2.15	6.40	0.08
PDAC 018	124.16	2.00	0.44	1.75	5.26	8.43	0.03
PDAC 019	324.71	2.47	0.58	1.56	2.00	15.57	0.03
PDAC 020	1369.68	2.25	0.30	0.96	4.17	6.40	0.03
PDAC 021	332.82	2.00	0.80	0.50	2.00	9.18	0.03
PDAC 022	342.98	2.92	0.33	3.65	2.00	22.19	0.05
PDAC 023	356.68	4.35	0.46	3.57	2.00	12.45	0.04
PDAC 024	282.23	4.33	0.62	1.94	2.00	16.13	0.03
PDAC 025	1629.91	3.24	0.46	1.29	2.00	9.95	0.04
PDAC 026	324.49	2.48	1.42	0.97	2.00	16.47	0.03
PDAC 027	806.16	2.10	0.77	0.82	2.00	14.91	0.03
PDAC 028	104.21	2.00	0.63	0.50	2.00	17.92	0.03
PDAC 029	1190.83	4.92	0.35	1.20	2.00	7.15	0.03
PDAC 030	30.20	2.00	0.30	0.88	8.80	8.88	0.03
PDAC 031	2954.99	2.09	0.62	1.14	2.00	6.40	0.05

PDAC 032	679.74	4.99	0.62	1.93	34.03	14.50	0.07
PDAC 033	203.83	2.00	1.08	1.27	16.28	6.40	0.03
PDAC 034	816.93	4.52	0.83	2.88	24.95	14.98	0.05
PDAC 035	88.00	2.00	0.94	0.74	2.00	8.42	0.03
PDAC 036	844.73	2.00	0.30	0.50	2.33	6.40	0.03
PDAC 037	30.33	2.00	0.33	0.63	3.48	7.29	0.03
PDAC 038	744.61	2.00	1.58	0.50	2.00	6.40	0.11
PDAC 039	545.80	2.00	0.30	1.91	2.33	36.36	0.03
PDAC 040	449.84	2.00	0.30	0.50	2.00	6.40	0.03
PDAC 041	89.18	2.00	0.30	0.50	2.00	13.40	0.03
PDAC 042	523.95	2.00	0.53	0.92	2.00	8.50	0.04
PDAC 043	3642.03	3.20	0.94	2.50	2.00	18.30	0.03
PDAC 044	108.00	2.00	0.50	0.50	2.00	6.40	0.03
HC 001	77.82	2.00	0.58	1.04	2.00	17.24	0.04
HC 002	30.20	2.00	0.30	0.50	2.00	6.40	0.03
HC 003	137.02	5.15	0.64	1.03	3.66	6.40	0.05
HC 004	275.73	9.80	0.61	2.09	2.00	6.40	0.05
HC 005	87.12	2.64	0.85	1.50	2.00	6.40	0.05
HC 006	91.35	2.00	0.30	0.50	2.00	10.26	0.03
HC 007	38.63	2.00	1.50	1.15	2.00	6.40	0.03
HC 008	95.84	3.59	0.91	1.74	2.00	6.40	0.03
HC 009	30.20	2.00	1.19	0.80	2.04	9.76	0.03
HC 010	41.95	2.64	2.02	0.79	2.00	6.40	0.05
HC 011	368.93	3.80	0.44	3.26	10.15	6.40	0.05
HC 012	50.11	2.00	0.30	0.50	2.00	6.40	0.03
HC 013	180.28	2.64	0.30	0.55	2.00	6.40	0.03
HC 014	94.43	2.00	0.30	0.55	2.00	6.40	0.05
HC 015	109.88	2.00	0.30	0.50	2.00	6.40	0.05
HC 016	42.91	2.00	0.55	0.55	2.00	6.40	0.05
HC 017	416.99	3.03	0.44	2.11	7.12	8.45	0.03
HC 018	43.63	2.00	0.85	0.50	2.00	6.40	0.03
HC 019	40.24	2.00	0.30	0.50	2.00	6.40	0.03
HC 020	30.20	2.00	0.67	0.50	2.00	6.40	0.03
HC 021	57.58	2.00	0.30	0.50	2.00	11.55	0.03
HC 022	88.10	2.00	0.30	0.50	2.00	10.31	0.03
HC 023	100.64	2.09	0.69	0.50	2.00	16.26	0.06
HC 024	78.70	2.09	0.30	0.50	2.00	18.43	0.04

HC 025	1317.77	3.18	0.55	2.03	7.23	15.26	0.03
HC 026	127.97	2.00	0.30	0.88	2.00	15.68	0.03
HC 027	30.20	2.33	0.84	15.72	2.88	6.40	0.03
HC 028	30.20	2.00	0.86	0.50	2.00	6.40	0.03
HC 029	74.27	2.00	0.30	0.50	2.00	6.40	0.03
HC 030	166.32	4.28	3.15	1.41	6.34	18.95	0.03
HC 031	38.99	3.68	1.47	1.41	3.08	30.38	0.03
HC 032	30.20	2.00	0.40	0.50	4.57	15.71	0.03
HC 033	3184.41	6.00	1.70	9.51	2.65	12.86	0.06
HC 034	30.20	2.00	0.79	0.50	2.00	19.99	0.03
HC 035	1973.40	11.80	2.85	20.73	66.53	6.40	0.09
HC 036	665.41	12.80	2.74	14.39	2.59	21.01	0.09
HC 037	30.20	3.68	1.65	1.18	2.10	37.15	0.03
HC 038	714.41	14.06	2.26	20.73	3.32	9.62	0.15
HC 039	30.20	2.47	1.28	0.95	4.57	22.99	0.03
HC 040	34.84	2.00	0.30	0.95	2.00	22.34	0.06
HC 041	30.20	3.68	0.30	0.95	2.00	25.85	0.03
HC 042	30.20	3.64	0.30	1.40	2.00	27.93	0.06
HC 043	52.47	2.00	0.45	1.19	2.00	16.22	0.03
HC 044	63.04	2.00	0.64	1.37	3.20	15.08	0.04
HC 045	58.87	2.00	0.55	1.19	4.05	12.48	0.03
HC 046	44.27	2.00	1.05	0.74	2.07	11.87	0.03
HC 047	80.84	2.00	1.22	1.91	18.07	23.58	0.03
HC 048	38.54	2.00	2.98	1.20	3.79	6.40	0.03
HC 049	30.20	2.00	0.50	0.50	2.37	6.40	0.03
HC 050	135.40	2.00	0.92	1.19	9.81	6.40	0.03
HC 051	305.74	4.61	0.64	2.45	3.45	6.40	0.03
HC 052	192.48	2.00	0.30	2.19	2.00	6.40	0.03
HC 053	292.78	2.92	0.63	3.75	3.43	15.32	0.05
HC 054	347.62	3.61	0.73	3.85	4.49	15.07	0.03
HC 055	198.34	4.27	0.92	3.28	11.08	9.37	0.05
HC 056	44.53	2.67	0.54	0.95	4.08	15.07	0.04
HC 057	181.64	2.94	1.15	3.09	2.00	16.04	0.05
HC 058	34.37	2.00	0.35	0.50	2.00	15.09	0.03
HC 059	317.21	2.00	1.11	1.86	4.19	23.58	0.03
HC 060	112.04	3.17	0.77	5.36	2.00	6.40	0.05
HC 061	164.32	4.34	1.04	5.91	2.00	8.94	0.05
HC 062	178.43	4.33	1.45	1.45	3.54	16.46	0.03
HC 063	190.98	3.97	0.30	1.29	3.08	22.76	0.03
HC 064	206.33	4.34	1.42	3.90	10.55	6.46	0.04
HC 065	30.20	2.00	0.30	0.50	2.00	6.40	0.03
HC 066	30.20	2.00	0.30	0.50	2.00	6.40	0.03
HC 067	140.06	2.86	0.62	1.61	11.18	8.53	0.04
HC 068	61.33	3.61	0.77	1.61	2.00	12.51	0.06

HC 069	41.54	2.00	0.99	1.31	2.00	12.61	0.03
HC 070	56.60	3.51	0.58	0.75	2.43	10.21	0.03
HC 071	30.20	2.00	0.63	0.50	2.00	6.48	0.03
HC 072	322.35	6.04	1.22	2.45	15.73	7.03	0.05
HC 073	30.20	2.00	0.54	0.57	2.00	7.60	0.03
HC 074	30.20	2.00	0.30	0.57	2.00	6.40	0.03
HC 075	47.88	2.00	0.41	1.26	3.10	16.68	0.03
HC 076	92.01	4.08	1.45	1.17	2.04	11.05	0.03
HC 077	55.61	2.00	1.06	0.50	2.00	6.40	0.03
HC 078	73.86	2.00	0.64	0.50	2.00	6.40	0.03
HC 079	65.55	2.08	0.39	0.61	2.00	7.40	0.03
HC 080	174.76	2.00	0.44	0.50	2.00	6.40	0.07
HC 081	63.70	2.65	0.66	0.67	2.00	9.36	0.03
HC 082	30.20	2.00	1.44	0.50	2.00	6.40	0.03
HC 083	50.12	2.00	0.30	0.50	2.36	6.40	0.03
HC 084	233.51	3.23	1.40	1.73	16.25	10.63	0.06
HC 085	30.20	2.00	0.49	0.50	3.18	6.40	0.03
HC 086	485.89	2.52	0.30	1.45	2.01	6.40	0.03
HC 087	30.20	2.00	0.43	0.84	2.00	6.40	0.03
HC 088	30.20	2.00	0.30	0.50	2.00	6.40	0.03
HC 089	30.20	2.00	0.64	0.61	2.00	6.40	0.03
HC 090	30.20	2.00	0.66	1.31	2.21	6.40	0.06
HC 091	30.20	2.00	0.30	0.50	2.00	6.40	0.03
HC 092	34.60	2.00	0.83	1.17	2.00	6.40	0.04
HC 093	40.04	2.00	0.30	0.59	2.00	6.40	0.03
HC 094	185.48	3.51	0.73	0.89	3.53	6.40	0.03
HC 095	44.53	2.00	0.30	0.50	7.34	13.01	0.03
HC 096	313.28	3.18	0.91	1.78	6.72	11.28	0.03
HC 097	30.20	2.00	0.51	0.50	2.00	9.48	0.03
HC 098	53.11	2.00	0.34	0.50	2.00	6.40	0.03
HC 099	53.11	2.00	0.98	1.13	6.66	7.16	0.03
HC 100	130.51	3.26	0.30	0.77	2.00	15.92	0.03
HC 101	3501.68	20.53	4.61	61.43	4.66	10.26	0.20
HC 102	3720.69	17.62	3.50	21.95	2.27	12.80	0.17
HC 103	77.12	2.00	0.30	0.96	2.00	6.99	0.03
HC 104	30.20	2.00	0.30	0.50	2.00	6.40	0.03
HC 105	34.11	2.00	3.20	0.89	2.00	6.40	0.03
HC 106	96.02	2.00	2.18	1.27	2.90	6.40	0.03
HC 107	30.20	2.00	1.10	0.50	2.00	6.40	0.03
HC 108	30.20	2.00	0.30	0.50	2.00	6.40	0.03
HC 109	122.92	6.60	0.55	3.85	2.00	6.40	0.08
HC 110	114.35	2.00	0.48	1.88	2.00	6.99	0.03
HC 111	30.20	2.00	0.75	0.50	2.00	6.40	0.03
HC 112	30.20	2.00	1.47	0.50	2.00	11.13	0.03

HC 113	44.53	2.00	0.30	1.40	2.00	15.07	0.03
OVAR 001	10890.43	66.67	9.84	131.03	4.22	6.40	0.58
OVAR 002	6796.93	110.79	11.62	126.10	3.49	6.40	0.86
OVAR 003	12048.40	90.11	10.43	163.07	2.19	28.53	0.62
OVAR 004	17764.28	57.74	6.54	78.16	6.48	6.40	0.39
OVAR 005	4202.78	94.00	9.24	127.95	3.49	6.40	0.42
OVAR 006	24260.21	66.22	9.83	79.04	2.56	6.40	1.16
OVAR 007	10967.70	48.57	6.26	91.81	14.34	6.40	0.46
OVAR 008	4869.03	175.28	18.89	105.92	3.48	6.40	0.46
OVAR 009	11200.48	97.37	16.23	84.56	9.35	6.40	1.66
OVAR 010	10132.18	73.08	17.46	433.06	2.00	6.40	0.90
OVAR 011	8829.51	61.02	11.81	36.35	12.39	6.40	0.77
OVAR 012	18861.83	69.20	20.77	183.28	5.82	6.40	1.09
OVAR 013	5128.12	66.58	9.02	77.76	2.80	6.40	0.97
OVAR 014	22891.15	77.71	17.89	115.81	17.03	6.40	0.78
OVAR 015	7023.04	61.61	17.53	7.86	89.04	18.13	0.86
OVAR 016	22997.49	129.03	24.25	135.74	48.50	6.40	0.94
OVAR 017	29480.78	77.70	15.24	134.61	16.03	6.40	1.11
OVAR 018	16324.88	137.09	18.51	146.80	28.08	6.40	1.16
OVAR 019	14831.95	51.10	11.77	95.36	2.35	6.40	0.40
OVAR 020	18897.65	100.51	16.00	134.09	11.82	6.40	1.20
OVAR 021	3273.09	81.69	8.38	53.16	6.01	24.89	0.77
OVAR 022	7425.33	56.07	14.17	112.31	2.00	6.40	0.32
OVAR 023	26392.14	276.39	89.04	68.79	30.36	143.51	3.48
OVAR 024	9263.83	83.08	10.10	198.55	2.00	6.40	0.13
OVAR 025	14569.06	75.56	12.84	74.81	2.00	6.40	0.61
OVAR 026	14892.75	74.72	9.61	123.45	2.98	6.40	0.56
OVAR 027	3915.27	75.68	11.33	96.32	8.50	6.40	0.87
OVAR 028	7394.29	76.68	7.46	62.76	6.84	6.40	0.74

OVAR 029	10988.61	65.36	18.07	173.25	2.00	6.40	0.46
OVAR 030	3405.20	51.10	8.61	199.53	3.15	6.40	0.40
OVAR 031	18720.17	165.81	15.90	146.76	22.29	62.61	2.61
OVAR 032	60121.23	120.91	32.10	32.03	6.69	6.40	0.91
OVAR 033	23330.12	73.16	9.31	113.61	7.15	6.40	0.91
OVAR 034	14591.65	64.49	13.11	92.49	5.81	6.40	0.84
OVAR 035	7139.39	90.47	20.69	113.38	2.00	471.72	0.98
OVAR 036	12043.40	71.69	29.49	56.70	2.00	6.40	0.69
OVAR 037	19356.83	70.60	10.50	101.68	7.82	13.63	0.60
OVAR 038	19444.59	83.80	9.89	72.11	8.85	18.21	1.33
OVAR 039	13252.87	83.87	9.28	81.26	8.98	6.40	0.88
OVAR 040	13873.83	77.12	33.12	58.72	2.00	6.40	0.58
OVAR 041	77518.97	104.48	16.41	81.71	6.93	6.40	1.99
OVAR 042	75155.00	91.09	15.70	84.38	4.85	6.40	0.52
OVAR 043	7628.07	124.42	17.13	58.88	16.99	87.42	0.92
OVAR 044	7704.09	97.80	9.92	132.38	5.54	6.40	0.42
BLDR 001	7834.62	74.58	15.17	72.85	689.67	13.67	0.30
BLDR 002	4809.21	77.11	13.38	155.67	809.73	53.03	0.52
BLDR 003	10084.77	93.77	10.76	139.07	1204.09	6.40	0.42
BLDR 004	9776.97	71.07	9.28	83.72	2.44	6.49	4.91
BLDR 005	3729.94	148.83	12.45	80.75	1216.95	6.40	0.25
BLDR 006	4300.08	83.33	8.54	114.35	445.18	6.40	0.30
BLDR 007	10262.12	126.87	21.21	71.31	5.92	6.40	1.08
BLDR 008	36226.36	130.22	11.10	123.31	2774.16	50.19	0.54
BLDR 009	18866.24	66.67	11.62	96.01	1822.00	6.40	0.62
BLDR 010	14248.88	75.74	10.26	65.33	10539.02	6.40	0.55
BLDR 011	50969.96	79.72	10.13	152.59	813.23	16.45	0.67
BLDR 012	31438.40	77.26	11.69	115.33	455.71	6.40	0.82
BLDR 013	10288.15	103.60	20.60	163.06	803.14	6.40	0.38

BLDR 014	16137.98	44.41	5.30	90.11	254.76	6.40	0.86
BLDR 015	5908.69	94.33	9.51	137.73	299.51	6.40	0.57
BLDR 016	12040.46	55.84	9.67	100.40	2.31	22.75	0.40
BLDR 017	4572.74	85.31	8.73	197.66	284.30	11.04	0.69
BLDR 018	10913.03	105.22	9.98	103.80	5898.73	6.40	0.45
BLDR 019	28875.18	67.32	11.30	118.72	1387.45	6.40	0.03
BLDR 020	21082.49	234.18	21.72	193.84	3522.12	6.40	4.28
BLDR 021	5586.89	80.06	9.75	75.40	863.15	6.40	0.85
BLDR 022	17355.99	112.79	15.49	137.96	1342.06	6.40	0.76
BLDR 023	3354.63	73.60	5.72	76.78	496.30	6.40	0.07
BLDR 024	3422.32	71.06	5.58	41.50	1792.90	6.40	0.28
BLDR 025	30645.35	85.56	8.56	113.65	3.57	29.32	0.41
BLDR 026	7411.72	87.99	16.35	110.00	776.08	6.40	0.69
BLDR 027	1773.13	81.17	9.63	142.12	959.70	88.89	0.37
BLDR 028	6835.72	105.20	12.10	67.77	488.59	6.40	0.57
BLDR 029	15989.33	145.84	20.09	131.28	1866.71	84.35	1.04
BLDR 030	8503.89	90.11	17.49	127.33	624.65	6.40	0.42
BLDR 031	6872.33	172.19	29.00	121.18	2426.09	6.40	0.86
BLDR 032	5921.35	83.36	9.98	78.67	670.55	6.40	4.80
BLDR 033	10983.76	82.22	8.99	90.10	5.70	6.40	1.06
BLDR 034	8271.44	60.86	12.73	78.18	260.04	6.40	0.61
BLDR 035	12189.72	108.22	18.65	111.35	721.09	252.91	0.83
BLDR 036	2444.95	65.98	5.30	106.08	4171.61	26.14	0.11
BLDR 037	9414.99	113.25	11.05	117.82	502.14	6.40	0.61
BLDR 038	4848.52	196.32	20.67	111.09	1963.12	65.60	0.85
BLDR 039	177859.59	96.02	13.27	132.05	33.55	6.40	0.55
BLDR 040	3733.11	46.94	6.14	100.60	594.82	35.05	0.22
BLDR 041	79503.06	91.09	11.38	103.09	4.17	6.40	0.42
BLDR 042	3338.99	107.82	13.55	177.42	1026.58	119.94	0.30

BLDR 043	2906.99	104.48	24.53	137.69	1051.02	6.40	0.52
BLDR 044	3179.46	50.25	15.70	187.99	1029.51	20.06	0.15
BLDR 045	15781.02	104.48	11.38	145.65	391.14	20.06	0.52
BLDR 046	32356.35	93.77	10.55	75.32	20.03	6.40	1.02
BLDR 047	6119.86	53.78	9.22	78.89	638.19	6.40	2.66
BLDR 048	44661.25	68.51	13.97	116.65	315.82	6.40	0.75
PDAC 001	43812.25	51.98	10.57	159.61	29.55	6.40	0.13
PDAC 002	57963.61	39.42	12.84	85.18	2.00	6.40	0.13
PDAC 003	70624.98	67.89	10.10	91.71	2.00	6.40	0.52
PDAC 004	6397.98	213.83	10.66	55.37	3.48	6.40	0.54
PDAC 005	64888.31	43.66	14.17	143.54	2.00	6.40	0.52
PDAC 006	76575.31	51.98	13.73	126.87	2.00	6.40	0.13
PDAC 007	15745.45	111.87	15.68	144.61	8.45	124.26	1.85
PDAC 008	107780.51	118.06	10.31	93.56	4.04	51.39	0.56
PDAC 009	47042.96	174.96	15.11	133.16	8.50	63.51	1.95
PDAC 010	180588.58	43.67	12.84	63.68	2.00	6.40	0.23
PDAC 011	46822.11	69.54	13.51	53.12	2526.05	23.64	0.65
PDAC 012	19490.55	67.58	9.19	104.36	4.30	11.07	0.69
PDAC 013	286827.18	83.33	10.97	89.65	22.96	6.40	0.83
PDAC 014	189955.47	59.33	10.03	97.79	2.00	6.40	0.65
PDAC 015	58349.89	84.62	12.69	119.52	4.37	6.40	0.80
PDAC 016	61365.38	95.30	17.05	139.65	1323.20	25.04	0.62
PDAC 017	14924.43	82.31	7.10	90.08	5.08	6.40	1.29
PDAC 018	44094.83	72.99	13.28	80.93	1137.54	6.40	0.55
PDAC 019	76502.04	69.60	11.10	78.11	11.02	24.89	0.67
PDAC 020	311948.69	79.83	9.92	85.69	806.18	18.72	0.46
PDAC 021	163921.87	56.26	6.68	84.14	2.00	6.40	0.37
PDAC 022	136867.70	51.10	14.89	130.77	3.15	6.40	0.50
PDAC 023	18508.21	86.99	15.53	191.49	2.00	6.40	0.49

PDAC 024	15518.00	76.70	11.05	84.68	211.03	6.40	0.45
PDAC 025	143649.42	83.36	12.10	92.87	8.27	50.60	0.96
PDAC 026	38122.11	45.93	26.20	14.47	2.08	64.76	0.43
PDAC 027	86274.81	52.15	13.98	90.68	2.82	78.92	0.49
PDAC 028	21284.98	65.45	8.78	69.28	2.00	6.40	0.68
PDAC 029	106564.55	124.49	10.86	58.74	2.00	6.40	0.65
PDAC 030	2588.92	47.02	8.36	33.66	507.95	6.40	0.48
PDAC 031	9858.71	75.74	11.81	77.27	8.20	6.40	0.85
PDAC 032	383404.52	56.10	6.84	79.48	12.81	6.40	1.10
PDAC 033	43746.65	80.62	11.91	113.28	1225.41	6.40	0.47
PDAC 034	57528.92	59.38	7.52	93.68	1257.79	6.40	0.34
PDAC 035	11149.22	51.15	9.38	92.80	1048.24	6.40	0.43
PDAC 036	148085.40	86.22	8.94	100.30	2.44	6.40	0.58
PDAC 037	13362.33	53.58	16.33	91.36	606.94	6.40	0.46
PDAC 038	159727.57	74.51	29.27	159.37	3.94	21.59	1.36
PDAC 039	88795.60	100.47	18.80	92.95	459.08	29.41	0.83
PDAC 040	118333.39	95.30	11.92	126.10	7.91	23.31	1.00
PDAC 041	42182.04	84.36	11.38	140.34	1086.34	6.40	0.42
PDAC 042	232193.54	61.45	8.86	178.86	2.00	6.40	0.03
PDAC 043	201351.55	42.88	7.33	85.69	2.19	6.40	0.51
PDAC 044	37302.54	185.07	26.43	145.69	483.19	6.40	3.03
HC 001	17976.54	96.39	25.48	245.91	13.07	6.40	0.91
HC 002	6081.76	69.25	16.02	167.40	5.75	82.92	0.85
HC 003	14402.61	135.84	10.81	73.42	8.64	6.40	1.32
HC 004	13199.64	129.64	10.16	51.74	7.44	6.40	1.21
HC 005	8867.36	73.16	12.40	98.31	6.32	6.40	0.63
HC 006	24902.79	87.52	12.21	51.41	34.76	6.40	0.94
HC 007	9295.74	83.62	13.98	101.53	5.75	6.40	0.83
HC 008	14587.62	98.15	9.17	180.57	6.25	6.40	1.21
HC 009	18106.60	46.27	6.73	133.14	284.57	6.40	0.52
HC 010	13683.94	110.80	9.49	169.91	6.25	6.40	1.11
HC 011	17451.49	48.08	6.95	135.11	305.73	6.40	0.53
HC 012	13303.04	75.47	8.51	53.09	2.00	6.40	0.78

HC 013	17918.96	78.73	8.18	65.31	3.37	6.40	0.82
HC 014	17306.50	68.86	8.18	57.17	2.41	6.40	0.71
HC 015	15503.50	62.17	6.84	51.74	3.85	6.40	0.62
HC 016	13092.89	88.52	12.09	121.81	4.81	6.40	1.48
HC 017	30967.56	62.27	10.97	114.35	813.61	6.40	0.20
HC 018	9490.92	65.19	7.28	77.36	4.81	6.40	0.97
HC 019	13603.26	85.26	10.15	106.38	4.33	6.40	1.27
HC 020	13499.63	94.91	11.77	111.09	5.29	6.40	1.45
HC 021	13724.15	65.36	10.31	37.10	9.23	6.40	0.51
HC 022	15305.99	69.26	10.86	38.93	9.64	6.40	0.55
HC 023	16258.84	61.42	9.96	36.65	8.81	6.40	0.41
HC 024	17701.37	73.16	10.75	39.84	10.48	6.40	0.51
HC 025	88985.80	65.79	8.65	75.32	341.26	6.40	0.66
HC 026	54680.33	65.36	15.90	136.86	8.40	6.40	0.73
HC 027	11444.53	36.80	8.82	92.62	229.63	6.40	0.16
HC 028	12506.67	40.60	9.52	90.95	195.43	6.40	0.19
HC 029	46475.40	48.21	5.16	68.08	243.99	6.40	0.49
HC 030	21283.66	57.14	13.55	108.43	11.18	20.06	0.61
HC 031	13539.08	84.36	18.19	135.03	397.38	30.97	0.42
HC 032	6560.23	50.25	9.18	143.00	459.36	6.40	0.61
HC 033	7864.69	87.33	12.07	156.88	209.58	6.40	0.77
HC 034	3956.56	91.09	10.65	113.76	9.76	40.60	0.92
HC 035	8750.45	131.02	12.10	135.03	11.90	6.40	0.85
HC 036	7610.02	90.63	11.00	141.66	172.93	6.40	0.72
HC 037	4536.79	117.79	14.98	129.72	13.35	73.13	1.18
HC 038	6544.93	50.25	7.71	135.03	368.01	6.40	0.52
HC 039	9309.80	150.75	16.41	180.07	15.53	6.40	0.99
HC 040	5375.50	82.63	9.92	115.33	3.90	13.51	1.24
HC 041	9234.27	77.60	12.82	87.06	922.69	30.97	0.42
HC 042	11402.33	66.44	11.69	83.37	779.85	11.04	0.37
HC 043	11867.01	118.93	16.33	99.85	13.36	6.40	0.69
HC 044	9475.42	285.06	37.39	107.96	729.62	334.44	3.84
HC 045	9309.13	261.63	37.23	117.71	736.72	323.59	3.74
HC 046	16918.31	56.07	10.57	115.01	2.00	6.40	1.39
HC 047	14815.00	51.98	10.09	113.38	2.00	6.40	1.30
HC 048	16778.05	60.04	11.03	124.18	2.00	6.40	1.56
HC 049	8445.58	136.01	16.31	107.98	21.48	6.40	2.23
HC 050	34815.13	261.64	33.60	76.45	177.10	316.04	3.98
HC 051	33748.15	270.36	33.96	77.54	172.69	298.16	4.05
HC 052	13311.50	132.44	15.45	103.65	25.52	98.86	2.23
HC 053	24478.11	70.75	11.36	149.67	241.00	6.40	0.47
HC 054	22994.66	75.63	12.00	128.85	252.37	6.40	0.45
HC 055	8923.87	65.53	8.38	94.40	442.78	16.10	0.87
HC 056	10152.99	55.53	7.53	107.34	440.22	6.40	0.75

HC 057	5905.31	58.06	11.59	97.20	6.93	27.11	0.69
HC 058	20882.63	65.15	12.21	63.83	6.70	6.40	0.86
HC 059	26809.55	139.21	23.69	103.65	21.48	98.86	2.65
HC 060	2996.02	61.44	11.55	107.81	6.01	6.40	0.81
HC 061	2962.11	63.48	12.44	116.42	5.60	6.40	0.77
HC 062	28087.24	186.28	16.43	103.02	234.41	78.65	0.81
HC 063	24631.34	153.07	14.22	90.57	203.51	15.88	0.74
HC 064	6806.82	51.10	7.92	99.19	358.97	6.40	0.70
HC 065	26643.93	232.98	13.23	73.32	167.92	32.30	0.81
HC 066	51541.45	59.38	11.77	47.40	6.42	6.40	0.87
HC 067	6846.81	46.93	6.99	41.63	440.64	6.40	0.77
HC 068	5075.26	79.71	11.77	99.67	311.32	6.40	0.40
HC 069	8650.53	63.15	16.72	185.83	318.77	6.40	0.20
HC 070	14810.50	64.41	10.47	116.78	381.03	6.40	0.12
HC 071	3830.39	47.93	10.16	100.45	2.00	6.40	0.21
HC 072	15505.51	63.13	10.77	127.25	392.78	6.40	0.09
HC 073	3729.51	50.47	10.77	106.29	2.41	6.40	0.21
HC 074	4110.55	53.02	11.09	111.53	3.26	6.40	0.22
HC 075	4336.27	55.57	11.39	112.70	3.69	6.40	0.38
HC 076	22165.47	73.21	15.96	158.61	81.71	6.40	0.87
HC 077	57302.24	55.57	9.54	79.42	17.13	6.40	1.63
HC 078	60609.09	53.02	8.60	77.07	16.65	6.40	1.63
HC 079	25464.37	83.20	18.06	171.36	97.43	6.40	0.95
HC 080	59963.21	53.02	8.60	73.56	15.21	6.40	1.50
HC 081	24653.67	75.71	16.57	166.72	88.18	6.40	0.87
HC 082	9899.62	68.14	10.61	112.68	18.16	6.40	0.50
HC 083	22459.62	45.36	10.62	59.47	569.36	6.40	0.51
HC 084	11891.23	42.80	7.34	71.21	791.53	6.40	0.48
HC 085	13843.17	50.48	7.34	71.21	891.56	6.40	0.62
HC 086	38825.25	68.19	12.01	137.71	588.03	6.40	0.57
HC 087	14694.93	71.95	10.93	189.88	20.53	6.40	0.62
HC 088	3034.44	58.10	10.78	127.83	7.26	6.40	0.38
HC 089	9510.68	45.36	10.78	137.71	430.36	6.40	0.51
HC 090	8025.41	42.80	10.16	121.43	390.80	6.40	0.38
HC 091	11320.83	59.35	10.16	74.72	12.83	6.40	0.50
HC 092	8409.48	42.80	9.22	115.61	379.82	6.40	0.38
HC 093	7530.72	45.32	9.21	86.99	4.15	6.40	0.21
HC 094	23709.71	66.92	11.70	109.78	496.41	6.40	0.20
HC 095	15911.41	82.63	21.52	86.04	330.12	42.16	0.54
HC 096	23181.25	63.15	9.85	107.45	466.22	6.40	0.12
HC 097	7992.52	60.62	8.27	100.45	414.91	6.40	0.12
HC 098	17064.72	40.22	9.21	74.72	3.26	6.40	0.12
HC 099	10246.94	45.37	7.97	111.53	603.29	6.40	0.51
HC 100	14462.01	35.07	7.97	85.27	2.41	6.40	0.20

HC 101	26773.08	50.47	9.53	124.34	12.20	6.40	0.21
HC 102	25851.27	47.90	9.53	129.57	2.85	6.40	0.25
HC 103	22019.29	63.77	10.81	125.75	4.55	28.53	0.52
HC 104	7015.09	54.70	8.91	160.65	3.32	16.41	0.43
HC 105	21244.78	75.10	16.33	207.90	252.80	6.40	0.35
HC 106	22188.12	78.99	17.31	210.23	265.63	6.40	0.51
HC 107	8270.01	69.27	17.74	175.12	185.51	6.40	0.41
HC 108	10021.39	66.67	15.45	78.25	2.00	40.89	0.62
HC 109	5908.66	131.35	14.57	159.37	8.52	6.40	1.65
HC 110	9541.61	56.17	13.09	68.48	2.00	16.86	0.58
HC 111	5452.07	121.09	13.83	154.44	8.52	6.40	1.50
HC 112	10288.35	66.67	15.45	78.25	2.00	51.44	0.67
HC 113	6013.74	82.63	16.93	173.78	149.53	6.40	0.54
Subject Cohort ID	**sFAS**	**Cathepsin D**	**FAP alpha**	**Ferritin**	**Galectin-3**	**IGFBP3**	**MIA**
OVAR 001	8.40	0.40	0.17	0.71	0.02	6.78	0.20
OVAR 002	8.40	0.73	0.79	2.44	0.03	9.80	0.34
OVAR 003	8.40	0.56	0.53	0.37	0.01	9.03	0.34
OVAR 004	8.40	1.44	2.49	4.82	0.11	16.99	0.52
OVAR 005	8.40	0.51	0.32	0.48	0.01	3.95	0.30
OVAR 006	8.40	1.23	0.15	0.19	0.01	2.60	0.14
OVAR 007	14.30	0.86	0.17	1.72	0.01	1.11	0.14
OVAR 008	28.78	0.40	0.17	0.65	0.01	2.79	0.27
OVAR 009	24.57	1.14	0.14	0.24	0.01	2.94	0.23
OVAR 010	19.60	2.20	0.46	0.15	0.01	3.27	0.37
OVAR 011	74.89	22.19	5.83	2.75	0.86	9.96	8.94
OVAR 012	101.31	20.16	5.63	2.52	0.73	9.95	8.60
OVAR 013	31.64	0.54	0.16	2.35	0.01	5.70	0.13
OVAR 014	33.03	3.62	1.40	3.37	0.01	6.47	0.42
OVAR 015	26.01	0.40	0.09	0.67	0.01	5.31	0.19
OVAR 016	8.40	0.59	0.05	0.10	0.01	2.63	0.12
OVAR 017	28.95	2.93	0.05	3.42	0.01	2.96	0.12
OVAR 018	33.21	0.76	0.32	0.38	0.01	5.81	0.22
OVAR 019	22.66	1.50	0.84	14.13	0.01	8.18	0.54

OVAR 020	8.40	0.84	0.05	0.73	0.01	2.50	0.12
OVAR 021	16.19	1.66	1.38	0.91	0.01	4.76	0.37
OVAR 022	8.40	0.40	1.03	0.57	0.01	2.97	0.12
OVAR 023	54.91	1.18	0.86	6.20	0.01	3.94	0.36
OVAR 024	61.83	1.78	0.48	14.83	0.01	2.40	0.35
OVAR 025	45.36	0.40	0.05	0.45	0.01	1.98	0.12
OVAR 026	22.03	0.40	0.38	0.04	0.01	2.09	0.12
OVAR 027	22.67	0.40	0.63	0.46	0.01	3.03	0.31
OVAR 028	20.54	0.70	0.36	0.55	0.01	8.97	0.48
OVAR 029	71.82	1.22	0.25	0.86	0.06	2.57	0.31
OVAR 030	15.15	0.76	0.33	1.58	0.01	9.50	0.33
OVAR 031	34.29	5.22	3.09	1.77	0.14	15.84	0.83
OVAR 032	26.61	0.52	0.10	8.50	0.01	5.27	0.13
OVAR 033	61.40	0.40	0.05	0.23	0.01	1.58	0.12
OVAR 034	12.95	0.43	1.31	1.52	0.01	11.37	0.38
OVAR 035	38.22	0.40	0.05	7.86	0.01	0.20	0.12
OVAR 036	44.74	4.20	0.57	52.19	0.01	8.56	0.17
OVAR 037	23.65	12.78	1.56	7.13	0.39	14.94	0.77
OVAR 038	37.09	3.16	0.46	0.44	0.04	4.38	0.33
OVAR 039	60.06	1.68	0.48	0.17	0.01	0.45	0.61
OVAR 040	8.40	1.01	0.43	0.40	0.01	6.08	0.19
OVAR 041	48.90	0.40	0.09	0.22	0.01	0.76	0.12
OVAR 042	104.13	0.77	0.19	1.46	0.03	2.50	0.12
OVAR 043	36.55	0.40	0.05	2.35	0.01	0.74	0.12
OVAR 044	180.31	0.43	0.25	0.44	0.03	3.68	0.12
BLDR 001	54.43	2.31	1.44	8.32	0.01	9.60	0.40
BLDR 002	8.40	0.40	0.08	0.69	0.01	1.65	0.12
BLDR 003	46.07	0.40	0.22	1.16	0.01	5.51	0.22
BLDR 004	17.55	0.40	0.10	0.11	0.02	3.85	0.12

BLDR 005	8.40	2.61	0.40	7.88	0.01	4.97	0.25
BLDR 006	25.77	0.73	1.58	5.48	0.12	8.09	0.14
BLDR 007	74.23	0.97	0.16	0.56	0.01	4.96	0.12
BLDR 008	8.40	1.47	0.47	0.50	0.01	5.65	0.39
BLDR 009	21.39	0.40	0.12	0.61	0.01	5.25	0.18
BLDR 010	8.40	1.49	0.50	0.65	0.01	3.18	0.19
BLDR 011	8.89	4.71	1.48	10.19	0.23	17.04	0.57
BLDR 012	8.40	2.23	2.41	4.95	0.01	9.99	0.43
BLDR 013	39.36	0.70	0.26	0.52	0.01	2.78	0.19
BLDR 014	34.02	0.46	0.33	0.58	0.01	5.58	0.42
BLDR 015	52.27	2.20	0.54	0.40	0.01	6.92	0.63
BLDR 016	13.84	1.66	2.08	1.45	0.01	13.62	0.64
BLDR 017	19.27	0.40	0.28	0.78	0.01	1.67	0.12
BLDR 018	49.45	0.40	0.18	0.12	0.01	2.79	0.28
BLDR 019	8.40	1.55	0.43	3.64	0.21	8.15	0.48
BLDR 020	21.66	0.97	0.32	0.29	0.10	8.67	0.38
BLDR 021	29.17	1.50	0.10	1.10	0.01	4.15	0.29
BLDR 022	24.96	0.59	0.35	0.10	0.01	5.94	0.45
BLDR 023	14.41	0.40	0.22	0.34	0.01	2.92	0.22
BLDR 024	21.26	1.07	1.09	1.27	0.01	5.86	0.48
BLDR 025	32.85	0.59	0.27	0.77	0.01	8.29	0.48
BLDR 026	8.40	0.69	0.33	1.39	0.01	3.43	0.27
BLDR 027	21.35	2.65	2.72	6.18	0.01	52.52	0.79
BLDR 028	15.94	2.56	1.25	1.96	0.01	13.00	0.46
BLDR 029	8.40	0.40	0.05	0.08	0.01	0.83	0.14
BLDR 030	88.60	0.71	0.22	0.96	0.01	5.67	0.28
BLDR 031	30.94	4.83	0.79	1.66	0.02	6.50	0.50
BLDR 032	8.40	2.91	0.42	5.10	0.01	10.12	0.31
BLDR 033	8.40	0.93	0.14	5.03	0.01	4.67	0.26

BLDR 034	125.43	0.40	0.20	0.16	0.01	0.98	0.15
BLDR 035	14.53	7.19	2.62	57.44	0.01	10.65	0.52
BLDR 036	14.94	3.40	0.05	1.72	0.01	0.20	0.12
BLDR 037	8.40	2.40	0.59	0.34	0.06	0.71	0.85
BLDR 038	59.68	0.40	0.17	2.28	0.01	0.60	0.12
BLDR 039	8.40	1.16	1.05	2.63	0.01	4.13	0.36
BLDR 040	28.95	0.65	0.31	2.84	0.01	3.62	0.36
BLDR 041	31.91	2.28	0.09	0.18	0.04	1.22	0.12
BLDR 042	22.60	0.40	0.07	0.06	0.01	0.52	0.12
BLDR 043	39.64	1.58	0.46	2.18	0.01	2.39	0.19
BLDR 044	114.82	0.40	0.13	0.98	0.01	1.65	0.12
BLDR 045	133.13	0.43	0.07	0.06	0.01	0.69	0.12
BLDR 046	17.55	0.40	0.90	0.50	0.17	11.30	0.51
BLDR 047	63.65	2.47	0.61	0.30	0.06	0.73	0.92
BLDR 048	82.73	21.64	7.74	3.69	0.49	11.02	12.47
PDAC 001	19.56	0.40	0.19	3.05	0.02	7.73	0.31
PDAC 002	105.69	0.92	0.84	13.05	0.01	9.08	0.36
PDAC 003	8.40	1.33	0.49	2.10	0.01	14.53	0.60
PDAC 004	21.68	6.56	1.66	0.86	0.18	2.95	2.61
PDAC 005	56.42	0.40	0.07	0.28	0.05	5.93	0.17
PDAC 006	53.29	1.12	0.28	1.83	0.01	9.05	0.41
PDAC 007	51.71	0.40	0.24	2.63	0.01	3.65	0.12
PDAC 008	20.54	3.01	0.30	0.94	0.01	7.01	0.41
PDAC 009	12.95	0.84	0.29	2.54	0.03	5.37	0.27
PDAC 010	22.80	1.67	0.40	1.79	0.10	3.51	0.39
PDAC 011	28.42	2.17	0.98	7.14	0.01	11.75	0.30
PDAC 012	36.25	2.29	1.26	5.53	0.05	5.48	0.25
PDAC 013	29.85	1.51	0.75	3.55	0.18	14.53	1.78
PDAC 014	8.40	6.61	1.69	0.83	0.17	2.99	2.70

PDAC 015	21.59	0.63	0.90	0.64	0.01	8.82	0.27
PDAC 016	53.39	0.42	0.15	0.34	0.01	1.18	0.22
PDAC 017	17.30	1.03	1.21	0.99	0.05	16.18	0.58
PDAC 018	28.95	0.40	0.19	0.40	0.01	3.54	0.21
PDAC 019	21.61	1.19	0.58	9.71	0.01	6.64	0.34
PDAC 020	20.72	0.40	0.27	7.99	0.01	9.02	0.41
PDAC 021	13.22	0.40	0.13	0.64	0.01	4.53	0.21
PDAC 022	16.24	2.00	0.93	31.12	0.01	13.27	0.43
PDAC 023	28.06	1.86	0.69	1.10	0.01	9.62	0.52
PDAC 024	15.53	0.71	0.25	10.53	0.02	5.64	0.33
PDAC 025	19.61	1.02	0.41	7.28	0.04	12.43	0.60
PDAC 026	39.26	3.06	0.42	16.05	0.02	7.73	0.25
PDAC 027	20.42	1.32	0.34	7.09	0.04	11.77	0.22
PDAC 028	39.60	1.83	1.25	5.70	0.08	9.48	0.50
PDAC 029	36.35	1.51	0.43	0.17	0.01	0.40	0.55
PDAC 030	23.00	0.71	0.30	0.89	0.01	4.59	0.31
PDAC 031	49.98	0.86	0.32	1.20	0.01	4.20	0.18
PDAC 032	59.67	0.69	0.13	1.97	0.01	4.77	0.22
PDAC 033	67.48	0.40	0.06	0.32	0.01	0.54	0.12
PDAC 034	48.14	0.40	0.05	0.17	0.01	0.20	0.12
PDAC 035	60.35	1.29	0.41	1.56	0.01	5.16	0.32
PDAC 036	8.40	0.63	0.67	1.44	0.01	5.81	0.47
PDAC 037	36.31	0.40	0.13	0.57	0.02	0.87	0.15
PDAC 038	8.40	0.46	0.22	1.82	0.01	6.71	0.27
PDAC 039	8.40	1.99	1.19	4.50	0.01	6.82	0.38
PDAC 040	8.40	2.35	0.64	0.15	0.01	4.22	0.47
PDAC 041	35.00	0.40	0.54	11.33	0.05	2.23	0.12
PDAC 042	28.24	0.84	0.37	0.62	0.03	3.12	0.36
PDAC 043	53.56	73.27	19.89	16.83	3.23	16.26	35.76

PDAC 044	28.64	0.55	0.37	13.72	0.03	6.16	0.14
HC 001	25.77	1.00	0.54	0.32	0.01	7.49	0.27
HC 002	14.63	1.50	0.20	0.14	0.01	3.46	0.12
HC 003	44.02	4.39	0.05	0.28	0.01	5.01	0.14
HC 004	8.40	1.67	0.05	0.20	0.01	5.87	0.12
HC 005	43.36	3.31	0.25	0.50	0.01	5.40	0.24
HC 006	20.28	10.14	0.51	0.54	0.05	8.84	0.34
HC 007	52.82	15.37	0.34	0.91	0.12	7.03	0.49
HC 008	24.57	2.85	1.05	0.14	0.01	11.62	0.33
HC 009	25.44	5.79	1.88	0.87	0.06	10.42	0.79
HC 010	25.86	1.63	0.55	0.12	0.01	4.96	0.27
HC 011	42.03	7.52	1.42	0.93	0.05	9.37	0.88
HC 012	20.58	3.14	0.72	1.60	0.06	18.53	0.46
HC 013	38.57	1.03	0.57	1.89	0.02	9.01	0.23
HC 014	27.17	3.24	0.53	1.07	0.06	20.49	0.37
HC 015	29.75	1.36	0.48	2.24	0.03	20.77	0.23
HC 016	68.59	0.57	0.31	0.56	0.03	3.90	0.17
HC 017	81.47	0.94	0.38	1.92	0.02	5.17	0.22
HC 018	37.26	0.70	0.48	0.71	0.02	7.53	0.20
HC 019	19.25	0.71	0.31	0.73	0.01	6.63	0.18
HC 020	15.11	6.11	3.13	5.15	0.12	10.03	0.54
HC 021	25.77	1.69	0.41	0.39	0.04	6.81	0.29
HC 022	22.15	2.01	0.67	0.64	0.05	9.21	0.32
HC 023	24.76	3.63	2.35	2.81	0.05	12.21	0.61
HC 024	21.69	3.82	0.57	0.73	0.01	6.35	0.33
HC 025	26.40	4.99	0.69	1.57	0.07	8.14	0.22
HC 026	23.75	1.49	0.57	0.24	0.01	9.91	0.31
HC 027	44.45	4.66	0.05	0.28	0.01	5.46	0.12
HC 028	17.57	0.82	0.10	0.18	0.03	5.85	0.12
HC 029	10.76	0.59	0.15	0.30	0.01	4.05	0.22
HC 030	93.42	1.40	0.35	0.19	0.01	3.16	0.12
HC 031	21.82	0.40	0.25	0.33	0.01	0.20	0.12
HC 032	10.12	0.40	0.28	0.12	0.01	0.70	0.12
HC 033	66.59	1.00	0.17	0.04	0.01	1.56	0.12
HC 034	58.14	0.88	0.22	0.89	0.06	1.52	0.16
HC 035	90.36	2.99	0.38	0.29	0.01	1.21	0.15
HC 036	70.43	1.81	0.86	0.10	0.01	6.73	0.12
HC 037	64.29	4.08	0.05	0.87	0.01	2.22	0.12
HC 038	108.71	309.01	0.86	0.48	0.04	3.47	0.50
HC 039	73.50	2.60	0.05	0.08	0.01	3.32	0.12
HC 040	8.40	2.22	0.24	0.71	0.01	1.92	0.19
HC 041	66.59	8.01	0.53	0.90	0.01	4.04	0.26
HC 042	8.40	3.49	0.49	0.59	0.03	3.76	0.32
HC 043	24.23	0.97	0.96	1.44	0.05	6.78	0.22

HC 044	29.91	0.40	0.12	0.18	0.02	4.17	0.12
HC 045	18.93	0.40	0.60	0.59	0.05	8.67	0.31
HC 046	23.94	1.52	1.40	1.47	0.04	15.62	0.45
HC 047	83.37	0.40	0.05	0.31	0.02	5.57	0.27
HC 048	53.59	0.78	0.60	0.97	0.02	7.94	0.23
HC 049	36.53	0.40	0.41	0.04	0.01	3.11	0.12
HC 050	28.58	0.40	0.26	0.29	0.02	7.62	0.25
HC 051	41.49	0.44	0.42	0.46	0.02	6.24	0.12
HC 052	26.92	0.40	0.05	0.29	0.02	5.96	0.32
HC 053	45.71	0.40	0.30	0.12	0.01	4.46	0.19
HC 054	37.62	0.49	0.80	0.39	0.02	8.98	0.24
HC 055	42.18	0.66	0.62	0.33	0.01	9.85	0.41
HC 056	18.09	0.96	1.01	0.38	0.01	7.80	0.39
HC 057	43.22	0.40	0.13	0.09	0.01	3.30	0.12
HC 058	17.32	14.15	0.05	0.35	0.01	14.23	0.12
HC 059	31.74	25.27	0.46	0.36	0.01	15.14	0.60
HC 060	46.22	0.59	0.55	1.17	0.01	7.05	0.42
HC 061	52.01	0.40	0.42	1.49	0.02	8.88	0.55
HC 062	55.10	0.40	0.11	2.40	0.02	2.36	0.17
HC 063	8.40	1.28	0.43	7.10	0.01	6.99	0.22
HC 064	55.81	1.92	0.26	0.17	0.01	4.97	0.40
HC 065	8.40	1.05	0.28	2.89	0.02	6.41	0.12
HC 066	8.40	0.40	0.16	3.04	0.01	5.92	0.13
HC 067	105.23	2.33	1.05	0.19	0.01	2.96	0.12
HC 068	33.16	0.40	0.12	0.05	0.01	6.00	0.24
HC 069	22.73	0.47	0.26	0.04	0.01	2.16	0.18
HC 070	21.34	0.66	0.22	0.33	0.01	1.09	0.12
HC 071	47.26	153.60	14.61	22.11	6.23	67.42	8.65
HC 072	49.19	0.96	0.93	9.15	0.01	2.23	0.23
HC 073	122.61	1.42	0.17	1.01	0.01	12.87	0.12
HC 074	23.54	2.04	1.27	1.08	0.01	25.85	0.48
HC 075	23.89	2.48	1.19	0.98	0.07	12.70	0.44
HC 076	35.99	3.09	1.53	0.32	0.09	20.56	0.40
HC 077	39.44	2.15	0.44	0.57	0.01	14.05	0.25
HC 078	35.90	1.22	0.31	0.43	0.02	16.21	0.19
HC 079	14.44	78.40	8.71	5.97	3.33	60.56	13.18
HC 080	70.42	1.16	0.24	0.28	0.01	13.98	0.23
HC 081	18.26	60.57	15.55	8.12	2.75	16.83	25.16
HC 082	20.40	0.77	0.48	0.16	0.01	6.22	0.25
HC 083	45.66	30.43	9.39	3.60	0.38	8.96	13.49
HC 084	47.81	0.69	0.25	0.15	0.01	2.31	0.29
HC 085	59.28	0.78	0.22	0.18	0.05	3.24	0.13
HC 086	22.33	0.62	0.22	0.05	0.01	2.56	0.12
HC 087	9.99	1.27	0.34	0.04	0.01	4.22	0.34

HC 088	11.38	0.91	1.77	0.37	0.04	11.12	0.34
HC 089	26.17	3.10	0.26	0.34	0.01	3.98	0.38
HC 090	17.57	0.44	0.25	0.16	0.01	2.01	0.17
HC 091	10.68	1.00	0.54	0.16	0.04	9.92	0.28
HC 092	21.34	0.57	0.40	0.08	0.01	3.03	0.14
HC 093	8.40	0.71	0.30	0.14	0.01	4.81	0.18
HC 094	30.90	0.44	0.22	0.04	0.03	1.69	0.21
HC 095	8.40	0.81	0.50	0.23	0.02	6.09	0.26
HC 096	37.05	3.38	1.52	0.76	0.11	13.84	0.48
HC 097	13.09	2.65	0.66	0.31	0.15	11.62	0.30
HC 098	13.81	1.46	2.02	0.68	0.01	17.36	0.31
HC 099	34.86	26.08	1.62	0.48	0.25	12.58	1.06
HC 100	52.82	0.40	0.22	0.10	0.01	6.01	0.20
HC 101	664.30	0.40	0.13	0.05	0.03	3.50	0.21
HC 102	271.21	0.87	0.53	0.10	0.01	7.01	0.24
HC 103	8.40	0.40	0.08	0.05	0.01	2.36	0.16
HC 104	13.39	0.40	0.10	0.04	0.01	1.86	0.12
HC 105	17.57	0.47	0.52	0.21	0.13	10.59	0.32
HC 106	38.81	0.40	0.49	0.20	0.09	8.03	0.19
HC 107	27.41	0.40	0.05	0.04	0.01	1.17	0.12
HC 108	21.90	0.98	0.35	0.52	0.01	5.04	0.23
HC 109	63.32	0.40	0.27	0.63	0.01	3.52	0.16
HC 110	43.60	0.40	0.21	0.19	0.01	1.81	0.25
HC 111	16.09	0.40	0.17	0.59	0.01	2.64	0.12
HC 112	25.86	0.73	0.31	0.43	0.01	4.75	0.23
HC 113	8.40	0.93	0.28	0.15	0.01	3.73	0.19
OVAR 001	2504.13	77.84	74.59	209.92	6.24	671.70	16.98
OVAR 002	1628.63	59.97	66.79	200.05	2.52	628.54	24.70
OVAR 003	1718.65	60.57	113.68	66.57	3.93	592.19	22.43
OVAR 004	680.02	79.41	36.14	84.36	4.32	312.71	15.81
OVAR 005	1495.40	88.42	97.53	138.51	4.07	479.43	33.91
OVAR 006	968.95	29.62	28.74	28.01	2.49	387.89	12.77
OVAR 007	1126.08	69.71	59.42	48.17	2.55	503.14	27.32
OVAR 008	2322.27	83.72	41.36	1410.22	4.87	810.33	25.45
OVAR 009	1055.14	76.25	29.58	404.73	5.11	665.76	20.51
OVAR 010	1134.66	4443.82	1033.46	549.17	97.80	909.42	1794.03
OVAR 011	500.65	81.64	59.86	467.37	10.13	1017.60	33.18
OVAR 012	615.19	44.62	78.89	268.57	4.66	482.11	29.90

OVAR 013	933.58	85.89	77.17	4924.21	6.16	4332.95	20.86
OVAR 014	2637.61	169.60	82.30	176.15	6.26	706.27	20.51
OVAR 015	1969.95	207.47	126.15	720.99	17.45	2719.83	51.09
OVAR 016	2671.19	68.94	76.33	16.84	5.42	825.95	18.57
OVAR 017	1847.18	87.76	43.94	1331.93	5.40	441.01	15.40
OVAR 018	1403.73	90.38	83.88	52.07	5.11	551.68	21.66
OVAR 019	1059.58	73.74	54.57	958.40	4.22	688.26	26.38
OVAR 020	1994.75	84.85	91.95	352.90	3.10	643.83	22.43
OVAR 021	1043.52	53.86	102.59	68.45	7.57	459.28	19.74
OVAR 022	8.40	54.89	124.44	70.32	2.54	529.39	20.70
OVAR 023	3322.14	76.72	61.45	543.04	24.98	941.92	22.05
OVAR 024	1024.28	77.19	78.26	2747.93	6.96	689.43	26.57
OVAR 025	1617.05	52.38	75.92	93.81	5.51	490.17	26.20
OVAR 026	1017.03	96.01	47.66	308.27	4.79	443.78	22.43
OVAR 027	906.84	85.82	59.61	49.73	4.08	447.47	20.90
OVAR 028	1175.47	69.71	101.08	74.79	3.95	647.51	31.00
OVAR 029	2113.13	1329.65	452.27	188.97	18.20	501.78	659.92
OVAR 030	1823.07	165.06	134.89	427.00	10.15	568.45	28.54
OVAR 031	1241.08	140.02	206.00	76.89	8.05	2473.63	51.63
OVAR 032	2414.58	254.85	144.51	4617.90	25.56	2744.97	38.76
OVAR 033	1514.46	12.93	15.44	9.37	0.01	89.06	7.50
OVAR 034	1212.74	128.70	181.11	141.91	7.37	1538.69	49.22
OVAR 035	1186.19	252.08	103.97	2785.57	15.37	625.41	58.19
OVAR 036	1360.87	360.78	128.83	8329.85	12.90	628.55	30.15
OVAR 037	1604.94	137.62	104.44	439.10	9.61	428.39	30.82
OVAR 038	824.26	169.32	132.85	63.26	5.90	409.17	21.52
OVAR 039	522.45	102.33	141.18	328.19	10.33	350.10	49.22
OVAR 040	2356.12	172.85	108.49	95.96	8.21	888.30	30.63
OVAR 041	588.07	60.66	156.29	306.10	15.96	7631.35	40.83

OVAR 042	935.86	251.00	228.86	245.95	27.98	7683.40	71.80
OVAR 043	661.44	718.33	59.72	7493.45	20.19	4348.96	37.31
OVAR 044	578.89	753.94	378.18	2440.63	17.04	8679.66	92.11
BLDR 001	872.26	102.91	108.44	487.71	11.22	908.98	27.90
BLDR 002	1572.21	54.97	61.78	210.00	5.74	330.10	14.97
BLDR 003	1299.59	56.83	70.38	115.36	8.05	590.06	23.83
BLDR 004	1049.92	65.68	71.46	21.93	4.05	638.18	23.83
BLDR 005	455.67	100.97	75.37	1101.37	7.94	526.45	22.53
BLDR 006	426.22	56.70	129.39	452.69	5.86	484.75	9.43
BLDR 007	1758.59	51.31	55.82	178.04	16.55	863.65	17.52
BLDR 008	2291.85	64.35	71.70	48.59	7.03	669.38	22.02
BLDR 009	1388.85	29.86	44.81	159.61	3.29	432.69	12.18
BLDR 010	496.69	59.45	77.19	40.98	4.14	396.31	21.23
BLDR 011	1341.11	55.71	66.30	259.77	5.71	647.25	12.74
BLDR 012	1406.28	76.10	117.28	178.96	5.75	709.64	22.43
BLDR 013	1353.37	55.71	77.48	139.33	5.71	418.74	20.94
BLDR 014	1193.24	37.91	75.17	123.04	3.37	510.79	20.66
BLDR 015	1342.57	62.73	55.32	26.84	4.72	536.64	18.23
BLDR 016	1424.81	147.86	146.83	156.65	10.85	796.05	25.17
BLDR 017	1837.37	57.53	94.52	257.74	5.03	516.32	17.03
BLDR 018	1794.71	66.72	146.74	51.44	8.06	837.73	33.89
BLDR 019	1394.43	106.01	109.32	541.32	7.01	716.01	38.21
BLDR 020	2608.40	30.57	30.67	21.93	5.25	374.93	13.40
BLDR 021	880.45	109.11	63.11	772.75	7.28	590.59	23.39
BLDR 022	2356.64	43.34	71.63	248.71	14.03	794.40	17.23
BLDR 023	873.97	61.59	81.75	90.77	5.74	458.94	18.37
BLDR 024	1150.12	79.61	80.37	77.56	9.23	601.02	22.96
BLDR 025	2580.70	257.93	60.20	140.56	6.67	1014.84	18.37
BLDR 026	2326.73	130.05	85.68	419.62	5.00	674.10	34.15

BLDR 027	1831.16	80.24	134.71	149.71	4.97	707.10	40.17
BLDR 028	1093.88	82.42	80.63	127.04	6.32	614.89	27.95
BLDR 029	2740.91	104.59	103.31	46.87	9.46	644.41	28.14
BLDR 030	2038.64	62.22	83.93	263.76	8.18	664.19	27.61
BLDR 031	2141.01	61.21	49.68	36.07	5.42	494.33	23.83
BLDR 032	945.35	117.95	89.34	735.13	4.46	1007.75	26.94
BLDR 033	1365.67	39.06	47.52	28.69	8.93	411.66	10.80
BLDR 034	899.80	58.57	49.52	221.06	10.26	507.22	19.22
BLDR 035	2273.99	170.21	210.30	4455.98	6.11	655.84	41.35
BLDR 036	1636.10	112.97	113.69	429.96	6.63	421.33	18.37
BLDR 037	1392.70	46.99	53.98	22.85	5.54	333.51	18.94
BLDR 038	871.92	91.02	239.47	2347.72	66.15	4868.86	47.15
BLDR 039	2146.16	78.52	47.46	47.75	10.03	576.30	26.01
BLDR 040	2219.16	69.58	99.80	1281.95	11.19	672.72	22.09
BLDR 041	707.25	49.33	93.61	173.51	3.03	444.54	31.02
BLDR 042	917.60	92.84	138.69	141.86	7.46	2301.06	50.43
BLDR 043	780.48	156.97	250.21	974.85	31.40	9459.05	54.51
BLDR 044	1072.72	129.92	205.10	1717.42	11.44	4372.99	64.75
BLDR 045	734.72	172.75	157.19	185.59	4.06	2607.34	114.10
BLDR 046	1051.74	33.18	76.59	18.24	2.57	489.39	14.13
BLDR 047	1765.76	41.13	69.25	24.38	8.04	380.71	13.29
BLDR 048	1406.21	55.84	68.51	29.92	7.61	587.87	17.80
PDAC 001	1721.93	49.73	57.60	419.52	4.53	491.47	25.82
PDAC 002	1803.08	160.31	105.54	1636.46	8.44	687.99	26.20
PDAC 003	1617.05	129.41	55.78	164.74	6.99	1152.11	31.73
PDAC 004	1372.12	83.88	59.23	2785.82	6.67	724.32	25.82
PDAC 005	779.35	142.27	58.49	87.28	7.27	675.78	20.90
PDAC 006	1844.61	115.98	57.25	406.85	5.52	572.13	20.51
PDAC 007	1464.07	78.14	43.62	711.73	6.61	598.60	22.81

PDAC 008	1796.28	85.74	138.08	266.29	6.58	1782.75	26.76
PDAC 009	1552.14	77.51	26.26	355.36	3.47	453.73	16.60
PDAC 010	1215.01	282.43	31.81	496.94	2.32	501.38	19.23
PDAC 011	1818.07	189.45	92.76	450.52	4.06	825.99	18.94
PDAC 012	1092.59	53.27	74.88	95.61	3.39	448.62	19.74
PDAC 013	704.31	58.77	63.43	226.19	3.50	570.96	29.53
PDAC 014	871.64	84.85	58.27	354.75	5.34	767.27	18.96
PDAC 015	2423.91	103.76	205.82	112.13	5.84	2251.36	26.36
PDAC 016	1980.64	98.02	93.94	729.22	4.22	656.71	30.63
PDAC 017	1467.58	47.80	83.41	75.78	4.71	2089.75	25.56
PDAC 018	3309.17	131.78	150.01	248.03	8.37	2011.94	61.59
PDAC 019	1567.79	189.43	93.15	1509.15	11.15	870.33	29.53
PDAC 020	1230.34	55.79	31.60	698.73	2.89	413.27	22.24
PDAC 021	586.06	80.04	74.27	405.94	4.93	814.36	20.51
PDAC 022	1964.39	121.72	57.63	1439.82	10.52	1032.01	23.19
PDAC 023	1987.18	100.72	89.18	140.92	5.45	856.63	32.82
PDAC 024	2715.39	163.79	53.61	2486.00	6.64	719.21	33.18
PDAC 025	1040.66	80.68	42.52	547.71	7.59	785.99	31.00
PDAC 026	1587.57	336.39	63.34	2080.80	5.43	625.98	18.74
PDAC 027	1066.13	132.96	55.30	734.29	6.48	923.97	18.96
PDAC 028	2418.46	456.16	78.96	1141.14	6.63	1008.89	28.43
PDAC 029	1367.74	83.87	91.02	149.77	3.41	892.36	36.76
PDAC 030	1246.04	156.87	98.38	1252.15	5.71	650.56	19.08
PDAC 031	900.75	71.29	51.97	161.84	4.83	1328.78	19.96
PDAC 032	832.59	74.74	52.81	30.53	7.58	374.56	17.80
PDAC 033	707.47	46.28	70.53	1453.92	10.15	550.45	17.80
PDAC 034	1580.96	55.96	67.04	648.97	8.53	470.61	14.41
PDAC 035	479.84	64.78	73.68	376.51	8.50	659.36	24.55
PDAC 036	1418.29	71.55	63.76	492.32	7.75	1543.64	18.65

PDAC 037	3154.28	34.93	0.05	19.64	0.01	74.71	9.96
PDAC 038	2080.96	72.74	85.14	187.26	7.75	986.66	18.65
PDAC 039	2092.07	85.77	99.73	377.35	5.87	697.68	29.53
PDAC 040	1263.64	70.13	93.12	306.78	5.86	685.37	30.39
PDAC 041	1264.02	63.74	171.59	4287.31	20.15	2731.46	36.40
PDAC 042	2589.35	67.20	47.16	1120.97	0.01	246.35	22.28
PDAC 043	1289.46	71.55	79.40	315.07	7.16	778.22	15.68
PDAC 044	1659.62	80.15	61.89	1692.21	6.89	535.32	12.46
HC 001	2185.49	83.74	88.10	37.30	8.98	624.17	18.08
HC 002	1621.58	45.81	71.92	21.93	8.56	442.68	10.52
HC 003	1269.58	50.10	83.58	9.63	8.45	544.53	11.07
HC 004	1114.13	62.35	113.22	12.09	12.59	621.55	13.85
HC 005	1975.14	86.25	62.80	74.18	13.75	609.57	23.83
HC 006	1700.66	96.26	54.31	47.75	1.86	758.68	18.65
HC 007	1581.18	95.38	80.71	104.30	7.29	896.36	18.37
HC 008	1404.68	70.50	106.65	9.01	4.67	829.77	14.83
HC 009	496.16	121.02	90.38	21.93	5.06	365.27	31.13
HC 010	1481.97	68.66	105.90	9.01	4.90	810.13	13.85
HC 011	762.48	127.50	100.59	21.31	4.83	440.79	30.84
HC 012	2543.45	65.55	60.26	101.84	13.06	715.54	14.69
HC 013	2790.78	79.33	74.48	127.96	15.04	706.38	17.09
HC 014	2644.85	74.87	64.77	98.76	14.58	842.47	15.25
HC 015	2520.38	89.35	79.68	164.52	17.50	776.50	19.80
HC 016	2097.70	103.35	84.36	81.25	13.76	615.48	12.46
HC 017	806.00	62.61	61.67	99.99	3.13	421.38	19.22
HC 018	1352.65	123.31	93.76	119.64	10.44	649.11	18.11
HC 019	1794.62	128.49	99.28	96.31	17.16	683.29	15.82
HC 020	2164.44	125.05	94.46	93.54	18.62	667.35	14.97
HC 021	1576.95	95.67	79.34	69.88	22.03	505.33	16.95
HC 022	1683.27	97.43	76.48	62.50	22.06	526.07	15.54
HC 023	1524.43	94.66	84.99	66.19	21.84	528.91	15.54
HC 024	1661.30	102.76	82.69	69.26	24.37	547.65	16.10
HC 025	733.43	62.22	78.14	62.19	6.42	432.09	13.29
HC 026	1411.25	96.55	126.03	40.23	7.52	840.05	24.67
HC 027	1262.97	163.49	80.60	36.99	7.35	714.74	17.52
HC 028	1211.49	153.61	68.51	31.15	6.79	826.74	16.10
HC 029	683.42	56.70	61.16	63.73	6.16	411.61	13.85
HC 030	615.59	85.74	165.21	97.89	6.60	2694.76	31.27
HC 031	871.92	168.87	94.21	111.87	9.21	2698.09	27.25
HC 032	569.71	214.21	250.99	115.90	3.82	279.73	71.80

HC 033	599.44	79.79	165.98	26.08	8.57	2150.78	26.12
HC 034	624.77	15277.71	499.43	1191.29	160.23	10113.00	80.69
HC 035	862.78	119.86	161.61	82.14	5.07	292.33	42.68
HC 036	679.76	262.43	281.89	34.56	9.26	5756.94	38.00
HC 037	1163.86	605.36	275.47	641.38	19.28	8203.22	30.01
HC 038	647.69	12026.14	603.31	187.17	22.04	5056.29	146.83
HC 039	578.89	128.65	214.05	28.08	12.57	5825.01	28.25
HC 040	1416.83	184.01	119.99	201.39	4.56	698.25	18.91
HC 041	739.30	74.01	146.85	208.64	26.23	1486.97	73.94
HC 042	1672.72	68.51	90.00	49.45	9.99	532.93	30.15
HC 043	1775.09	102.16	98.73	61.27	29.35	617.82	22.67
HC 044	1443.46	58.70	83.70	29.92	31.78	420.52	19.80
HC 045	1431.15	41.13	59.75	21.31	14.38	314.77	13.57
HC 046	1234.92	56.45	64.63	36.68	6.95	674.56	13.57
HC 047	1173.61	92.19	101.83	71.30	5.17	659.65	18.74
HC 048	1259.22	75.49	99.43	68.61	5.39	650.71	17.93
HC 049	979.57	82.11	148.77	13.31	13.31	699.33	21.96
HC 050	2090.21	209.99	186.57	70.40	4.64	1794.22	27.55
HC 051	2040.10	212.27	168.08	60.50	5.41	949.11	25.56
HC 052	816.24	62.11	111.22	19.04	11.23	586.79	15.08
HC 053	2138.63	62.96	126.49	23.76	3.36	910.01	25.17
HC 054	1898.69	65.55	126.84	21.88	3.41	716.96	23.57
HC 055	1498.03	65.26	31.72	19.99	0.01	434.89	13.44
HC 056	1348.07	65.04	74.61	17.86	1.84	389.41	19.12
HC 057	1156.02	114.30	165.06	48.71	9.45	864.49	27.55
HC 058	2088.89	233.77	87.00	22.73	6.21	406.32	25.05
HC 059	2079.28	147.65	111.99	22.82	4.83	2374.06	23.57
HC 060	1352.36	61.82	174.50	294.20	2.40	2239.89	32.31
HC 061	1292.36	59.13	171.56	283.64	2.53	1961.07	28.75
HC 062	2416.92	214.06	100.20	1003.30	11.30	791.92	21.56
HC 063	2228.09	225.79	107.25	1004.91	12.82	1827.89	23.17
HC 064	1576.63	67.88	65.08	21.88	2.22	443.14	20.36
HC 065	1313.59	244.06	88.67	383.57	5.68	882.30	16.71
HC 066	1826.46	114.66	192.23	1633.33	7.53	2150.86	26.76
HC 067	12967.33	787.78	252.85	48.71	3.43	439.28	9.71
HC 068	1457.73	74.73	123.27	25.64	3.56	683.41	23.17
HC 069	2347.00	95.32	106.43	30.31	2.63	1912.19	21.16
HC 070	1519.98	103.76	95.24	262.90	2.73	810.56	18.74
HC 071	782.56	57.87	106.95	63.21	4.10	659.65	19.55
HC 072	1579.60	127.20	108.89	306.85	3.63	915.63	22.37
HC 073	928.97	60.12	118.23	69.51	4.93	743.26	19.95
HC 074	959.98	57.46	112.86	60.50	4.46	585.27	21.96
HC 075	1028.89	59.56	110.18	57.79	3.83	665.54	18.34
HC 076	1861.78	161.70	109.49	106.85	5.89	2056.34	33.10

HC 077	1684.06	165.82	112.34	53.26	7.08	2538.66	33.10
HC 078	1646.86	171.10	110.87	54.17	5.70	2244.88	34.67
HC 079	2105.31	69.06	86.17	73.99	5.09	753.54	28.35
HC 080	1564.83	177.39	113.98	55.07	6.72	2937.69	27.95
HC 081	1972.83	141.99	106.64	100.67	5.91	2124.42	27.16
HC 082	882.10	92.03	177.62	19.04	12.40	756.99	26.76
HC 083	36143.53	327.53	243.43	28.44	2.18	575.09	15.29
HC 084	1328.48	91.70	95.49	33.09	7.45	491.53	17.93
HC 085	1519.99	81.49	79.02	32.16	4.30	334.43	19.15
HC 086	1643.10	76.86	163.15	72.65	19.41	568.78	22.77
HC 087	1112.78	84.63	119.40	17.14	3.70	583.91	18.34
HC 088	1127.99	55.38	151.82	22.82	4.79	682.55	21.96
HC 089	1245.53	94.33	93.74	8.44	13.85	485.08	34.28
HC 090	1203.90	105.66	93.27	6.47	7.91	426.76	35.26
HC 091	1021.13	92.19	150.27	15.23	12.36	953.30	25.96
HC 092	1143.16	92.35	94.21	6.47	7.38	401.99	38.41
HC 093	1134.92	53.73	143.97	28.44	4.95	587.12	25.56
HC 094	1887.94	86.53	116.50	28.44	3.91	649.93	23.57
HC 095	1527.11	111.67	96.38	27.69	3.82	664.22	23.25
HC 096	1854.64	86.85	121.70	28.44	3.94	706.64	23.17
HC 097	1369.64	115.38	100.03	19.04	5.70	603.83	20.76
HC 098	1004.95	70.24	171.07	31.24	6.61	892.85	19.95
HC 099	883.09	181.74	136.28	14.27	17.41	521.60	38.60
HC 100	1377.48	56.76	102.56	9.42	11.07	2304.23	18.74
HC 101	1972.81	135.25	133.72	10.17	11.80	621.21	41.98
HC 102	1727.82	110.11	114.76	9.25	8.72	503.63	33.65
HC 103	1780.67	46.74	55.53	5.47	1.04	587.60	15.90
HC 104	790.08	36.56	68.50	10.40	1.59	368.96	11.79
HC 105	2217.91	9.47	0.05	0.04	0.11	0.59	0.12
HC 106	2342.70	152.23	146.05	20.49	11.34	414.29	27.73
HC 107	1683.24	119.52	121.50	14.75	6.64	303.75	26.11
HC 108	2207.64	22.23	29.91	18.09	7.02	255.09	0.12
HC 109	1438.66	35.43	72.72	148.41	2.64	432.64	24.57
HC 110	2011.89	58.15	63.13	52.35	10.90	415.53	28.55
HC 111	1350.19	84.65	124.79	165.15	6.14	271.50	28.27
HC 112	2123.15	208.70	135.87	85.56	29.62	337.88	47.34
HC 113	1913.95	92.75	82.63	27.69	3.21	681.74	20.78
Subject Cohort ID	**MPO**	**SHBG**	**TIMP1**	**TIMP2**			
OVAR 001	0.09	0.05	0.52	0.20			
OVAR 002	0.16	0.48	1.26	0.55			
OVAR 003	0.12	0.07	1.01	0.32			

OVAR 004	0.26	0.44	1.38	1.04			
OVAR 005	0.10	0.07	0.59	0.24			
OVAR 006	0.37	0.05	0.95	0.13			
OVAR 007	0.16	0.05	1.30	0.15			
OVAR 008	0.25	0.05	0.79	0.10			
OVAR 009	0.26	0.05	1.36	0.19			
OVAR 010	0.34	0.10	1.40	0.35			
OVAR 011	1.74	4.14	2.25	5.84			
OVAR 012	1.65	4.07	2.05	5.37			
OVAR 013	0.26	0.11	1.19	0.19			
OVAR 014	0.50	0.17	1.91	0.60			
OVAR 015	0.43	0.05	0.69	0.10			
OVAR 016	0.57	0.05	1.30	0.19			
OVAR 017	0.73	0.05	2.76	0.19			
OVAR 018	0.47	0.15	0.59	0.36			
OVAR 019	0.50	1.07	1.74	0.67			
OVAR 020	0.18	0.05	0.99	0.16			
OVAR 021	0.34	0.34	1.67	0.65			
OVAR 022	0.03	0.05	1.17	0.04			
OVAR 023	0.96	0.05	2.75	0.40			
OVAR 024	0.14	0.05	1.33	0.42			
OVAR 025	0.07	0.46	0.01	0.47			
OVAR 026	0.09	0.05	0.01	0.04			
OVAR 027	0.19	0.05	1.34	0.48			
OVAR 028	0.08	0.12	0.48	0.15			
OVAR 029	0.32	0.13	1.20	0.20			
OVAR 030	0.33	0.08	0.34	0.12			
OVAR 031	0.33	2.24	1.13	0.53			
OVAR 032	0.29	0.05	2.00	0.72			

OVAR 033	0.03	0.05	0.01	0.04			
OVAR 034	0.22	1.07	1.37	0.38			
OVAR 035	0.27	0.05	2.45	0.43			
OVAR 036	1.64	0.75	2.55	0.53			
OVAR 037	1.17	0.42	1.87	0.34			
OVAR 038	0.76	0.31	1.85	0.38			
OVAR 039	0.18	0.23	0.32	0.81			
OVAR 040	0.28	0.32	2.07	0.24			
OVAR 041	0.13	0.05	0.44	0.09			
OVAR 042	0.62	0.06	0.97	0.14			
OVAR 043	0.65	0.05	1.21	0.30			
OVAR 044	0.32	0.05	0.56	0.23			
BLDR 001	0.11	0.71	2.07	0.59			
BLDR 002	0.08	0.05	0.52	0.11			
BLDR 003	0.19	0.14	0.50	0.22			
BLDR 004	0.12	0.09	0.45	0.20			
BLDR 005	1.84	0.08	0.92	0.34			
BLDR 006	0.30	0.23	0.80	0.41			
BLDR 007	0.23	0.30	1.68	0.21			
BLDR 008	1.74	0.07	1.49	0.60			
BLDR 009	0.13	0.05	0.37	0.14			
BLDR 010	0.20	0.08	1.20	0.29			
BLDR 011	0.33	2.12	1.63	0.74			
BLDR 012	0.42	1.09	1.78	1.12			
BLDR 013	0.31	0.05	1.21	0.17			
BLDR 014	0.11	0.11	0.58	0.22			
BLDR 015	0.14	0.80	1.95	0.45			
BLDR 016	0.41	1.28	2.04	1.16			
BLDR 017	0.13	0.12	0.32	0.15			

BLDR 018	0.13	0.05	0.61	0.21			
BLDR 019	1.00	0.32	0.95	0.18			
BLDR 020	0.32	0.20	1.02	0.18			
BLDR 021	0.16	0.05	1.52	0.16			
BLDR 022	0.17	0.05	0.93	0.37			
BLDR 023	0.10	0.06	0.33	0.13			
BLDR 024	0.42	0.58	1.65	0.65			
BLDR 025	0.15	0.29	1.73	0.23			
BLDR 026	0.21	0.10	0.58	0.25			
BLDR 027	0.24	0.41	2.24	1.06			
BLDR 028	0.43	0.40	2.78	0.91			
BLDR 029	0.20	0.05	0.23	0.06			
BLDR 030	0.21	0.10	1.26	0.27			
BLDR 031	2.72	1.62	3.23	1.18			
BLDR 032	0.40	0.05	1.96	0.35			
BLDR 033	0.13	0.08	1.19	0.25			
BLDR 034	0.32	0.07	0.45	0.11			
BLDR 035	0.82	0.52	4.03	1.20			
BLDR 036	0.24	0.05	2.38	0.52			
BLDR 037	0.18	0.41	0.25	0.61			
BLDR 038	0.04	0.05	0.19	0.08			
BLDR 039	0.21	0.05	1.62	0.50			
BLDR 040	0.10	0.05	0.74	0.22			
BLDR 041	0.31	0.08	11.12	0.61			
BLDR 042	0.42	0.05	0.52	0.19			
BLDR 043	0.25	0.96	0.96	0.19			
BLDR 044	0.11	0.08	0.73	0.22			
BLDR 045	0.05	0.05	0.76	0.21			
BLDR 046	0.38	1.11	0.36	0.22			

BLDR 047	0.19	0.42	0.26	0.59			
BLDR 048	2.72	5.79	1.78	3.36			
PDAC 001	0.11	0.05	0.75	0.23			
PDAC 002	0.32	0.57	0.98	0.33			
PDAC 003	0.25	0.36	0.84	0.21			
PDAC 004	0.54	1.17	0.83	1.83			
PDAC 005	0.06	0.05	0.22	0.07			
PDAC 006	0.43	0.20	1.87	0.93			
PDAC 007	0.33	0.10	0.52	0.31			
PDAC 008	0.66	0.14	2.20	0.25			
PDAC 009	0.14	0.12	0.87	0.27			
PDAC 010	0.18	0.49	0.89	0.25			
PDAC 011	0.86	0.42	2.47	0.62			
PDAC 012	0.19	1.11	1.48	0.66			
PDAC 013	1.81	0.96	0.51	0.16			
PDAC 014	0.55	1.20	0.84	1.84			
PDAC 015	0.38	0.28	1.08	0.29			
PDAC 016	0.08	0.09	0.48	0.09			
PDAC 017	2.00	1.16	1.81	0.73			
PDAC 018	0.11	0.06	0.69	0.14			
PDAC 019	0.26	0.12	1.12	0.32			
PDAC 020	0.21	0.69	0.62	0.17			
PDAC 021	0.07	0.06	0.46	0.14			
PDAC 022	0.33	0.52	1.93	0.80			
PDAC 023	0.21	0.58	2.09	0.41			
PDAC 024	0.14	0.16	1.09	0.23			
PDAC 025	0.38	1.21	0.85	0.17			
PDAC 026	0.91	1.39	2.59	0.39			
PDAC 027	0.28	0.08	0.85	0.21			

PDAC 028	0.40	1.90	2.24	0.89			
PDAC 029	0.16	0.20	0.31	0.78			
PDAC 030	0.26	0.05	1.12	0.22			
PDAC 031	0.27	0.05	0.98	0.20			
PDAC 032	0.10	0.09	1.82	0.21			
PDAC 033	0.97	0.05	0.19	0.05			
PDAC 034	0.03	0.05	0.01	0.04			
PDAC 035	0.18	0.05	1.09	0.32			
PDAC 036	0.12	0.25	0.68	0.89			
PDAC 037	0.13	0.11	0.43	0.12			
PDAC 038	0.29	0.14	0.84	0.20			
PDAC 039	0.42	0.89	1.25	0.73			
PDAC 040	0.27	0.18	1.68	0.45			
PDAC 041	4.14	0.05	0.95	0.52			
PDAC 042	0.16	0.05	0.53	0.36			
PDAC 043	10.02	31.23	10.34	23.72			
PDAC 044	0.31	0.29	2.08	0.41			
HC 001	0.37	0.06	1.30	0.39			
HC 002	0.22	0.05	1.19	0.24			
HC 003	1.29	0.05	2.32	0.39			
HC 004	0.76	0.05	1.58	0.62			
HC 005	0.82	0.19	2.85	0.37			
HC 006	1.43	0.06	3.88	0.61			
HC 007	0.69	0.11	11.14	0.50			
HC 008	0.28	0.17	1.82	0.54			
HC 009	0.16	0.23	1.83	0.70			
HC 010	0.22	0.08	1.47	0.35			
HC 011	0.17	0.33	2.83	1.00			
HC 012	0.34	0.97	2.21	0.64			
HC 013	0.16	0.87	1.00	0.49			
HC 014	0.45	0.73	2.17	0.54			
HC 015	0.15	0.71	1.48	0.62			
HC 016	0.33	0.20	0.59	0.26			
HC 017	0.27	0.35	1.21	0.37			
HC 018	0.20	0.34	1.02	0.45			

HC 019	0.18	0.41	0.61	0.29			
HC 020	0.80	2.50	2.16	1.56			
HC 021	0.50	0.48	1.41	0.31			
HC 022	0.57	0.74	1.43	0.37			
HC 023	0.37	2.60	1.64	1.03			
HC 024	1.39	0.62	2.11	0.34			
HC 025	0.52	0.30	3.18	0.62			
HC 026	0.47	0.11	1.88	0.40			
HC 027	0.51	0.05	2.80	0.31			
HC 028	0.27	0.10	0.90	0.20			
HC 029	0.12	0.05	0.86	0.20			
HC 030	0.41	0.05	2.37	0.51			
HC 031	0.42	0.27	0.01	0.61			
HC 032	0.04	0.05	0.78	0.28			
HC 033	0.40	0.05	2.63	0.36			
HC 034	0.30	0.19	0.98	0.16			
HC 035	0.20	0.05	11.50	0.58			
HC 036	0.59	0.09	2.35	0.36			
HC 037	0.41	0.05	2.65	0.29			
HC 038	0.54	0.12	8.87	0.31			
HC 039	0.55	0.05	2.34	0.34			
HC 040	0.38	0.05	2.29	0.31			
HC 041	1.24	0.05	3.47	0.73			
HC 042	0.62	0.15	2.11	0.36			
HC 043	0.78	0.27	0.93	0.57			
HC 044	0.37	0.16	0.40	0.18			
HC 045	0.63	0.68	0.59	0.27			
HC 046	0.50	1.50	0.51	0.40			
HC 047	0.41	0.06	0.32	0.11			
HC 048	0.39	0.59	0.42	0.29			
HC 049	0.03	0.05	0.01	0.04			
HC 050	0.20	0.05	0.41	0.20			
HC 051	0.22	0.06	0.48	0.33			
HC 052	0.55	0.05	0.79	0.44			
HC 053	0.17	0.55	0.95	0.38			
HC 054	0.45	1.20	1.14	0.50			
HC 055	0.21	0.33	0.45	0.34			
HC 056	0.14	0.24	0.67	0.65			
HC 057	0.15	0.05	0.47	0.14			
HC 058	0.80	0.05	1.58	0.28			
HC 059	0.89	0.40	2.14	0.18			
HC 060	0.50	0.47	1.13	0.27			
HC 061	0.41	0.34	0.36	0.15			
HC 062	0.50	0.07	0.38	0.11			

HC 063	0.49	0.36	0.96	0.28			
HC 064	0.10	0.17	1.86	0.37			
HC 065	0.53	0.18	0.64	0.28			
HC 066	0.38	0.09	0.83	0.18			
HC 067	0.20	0.18	1.26	0.34			
HC 068	0.30	0.05	0.25	0.14			
HC 069	0.20	0.10	0.91	0.22			
HC 070	0.13	0.05	0.46	0.10			
HC 071	2.24	10.78	3.42	8.55			
HC 072	0.44	0.29	0.80	0.41			
HC 073	0.37	0.09	1.37	0.76			
HC 074	0.63	0.22	1.82	0.71			
HC 075	0.79	0.19	2.19	0.62			
HC 076	0.63	1.08	1.19	0.82			
HC 077	0.71	0.05	0.93	0.34			
HC 078	0.75	0.87	0.55	0.33			
HC 079	3.00	6.14	9.16	20.66			
HC 080	0.71	0.05	0.47	0.28			
HC 081	4.95	11.33	18.01	41.41			
HC 082	0.31	0.05	0.70	0.24			
HC 083	3.22	4.92	1.73	3.72			
HC 084	0.12	0.05	1.05	0.15			
HC 085	0.07	0.05	0.58	0.22			
HC 086	0.10	0.05	0.68	0.07			
HC 087	0.19	0.05	1.04	0.04			
HC 088	0.36	0.22	1.08	0.65			
HC 089	0.24	0.10	2.40	0.27			
HC 090	0.14	0.05	0.77	0.14			
HC 091	0.39	0.08	1.00	0.35			
HC 092	0.11	0.10	1.04	0.23			
HC 093	0.30	0.05	0.91	0.26			
HC 094	0.21	0.12	0.29	0.17			
HC 095	0.35	0.17	0.54	0.35			
HC 096	0.95	1.49	1.14	0.55			
HC 097	0.92	0.47	0.45	0.22			
HC 098	0.57	0.50	1.44	0.72			
HC 099	0.66	0.16	2.07	0.31			
HC 100	0.48	0.16	0.49	0.21			
HC 101	0.13	0.10	0.43	0.19			
HC 102	0.18	0.56	1.42	0.55			
HC 103	0.08	0.05	0.30	0.11			
HC 104	0.04	0.05	0.28	0.09			
HC 105	0.20	0.45	0.46	0.20			
HC 106	0.22	0.43	0.55	0.31			

HC 107	0.03	0.11	0.23	0.13			
HC 108	0.67	0.38	1.17	0.39			
HC 109	0.27	0.19	0.46	0.21			
HC 110	0.22	0.15	0.63	0.26			
HC 111	0.15	0.08	0.27	0.14			
HC 112	0.46	0.30	0.70	0.29			
HC 113	0.13	0.23	1.39	0.27			
OVAR 001	9.96	35.25	56.85	42.67			
OVAR 002	10.43	42.99	78.87	48.01			
OVAR 003	9.73	20.34	63.44	46.01			
OVAR 004	31.00	72.36	155.50	53.71			
OVAR 005	11.38	34.93	69.72	57.78			
OVAR 006	3.12	66.95	25.71	20.79			
OVAR 007	15.20	45.65	63.19	44.25			
OVAR 008	14.07	38.64	121.75	58.17			
OVAR 009	11.30	39.38	129.41	50.94			
OVAR 010	460.22	1124.51	527.60	1269.84			
OVAR 011	42.58	62.02	118.66	62.03			
OVAR 012	10.78	40.70	64.26	53.08			
OVAR 013	34.59	97.52	127.12	96.96			
OVAR 014	14.77	13.35	71.31	41.18			
OVAR 015	75.56	38.47	146.60	67.57			
OVAR 016	29.08	22.91	95.82	64.01			
OVAR 017	30.47	13.58	120.18	38.41			
OVAR 018	36.82	46.12	70.25	57.39			
OVAR 019	27.16	76.19	87.67	49.99			
OVAR 020	16.11	30.14	89.60	48.09			
OVAR 021	17.28	31.09	64.50	52.88			
OVAR 022	13.08	62.07	93.98	59.62			
OVAR 023	42.58	23.66	625.44	54.02			
OVAR 024	10.82	47.38	92.38	61.45			

OVAR 025	5.61	133.44	92.08	83.49			
OVAR 026	9.03	72.03	120.51	61.84			
OVAR 027	13.03	46.65	98.23	50.31			
OVAR 028	5.53	52.88	66.02	59.93			
OVAR 029	166.87	248.29	82.52	214.31			
OVAR 030	74.98	24.70	78.93	89.69			
OVAR 031	22.13	106.40	76.46	95.73			
OVAR 032	46.99	29.91	558.79	98.78			
OVAR 033	6.31	5.44	20.78	8.70			
OVAR 034	31.28	122.74	176.75	84.49			
OVAR 035	72.61	82.33	185.23	89.54			
OVAR 036	125.72	72.50	169.21	69.31			
OVAR 037	49.91	22.34	137.60	78.48			
OVAR 038	46.18	86.69	71.46	66.89			
OVAR 039	18.64	106.00	101.40	80.77			
OVAR 040	33.39	104.36	360.91	63.53			
OVAR 041	27.37	49.72	80.66	46.40			
OVAR 042	110.12	223.62	99.38	60.87			
OVAR 043	257.34	77.28	559.93	111.68			
OVAR 044	75.80	258.52	105.06	74.35			
BLDR 001	5.04	55.31	108.84	46.08			
BLDR 002	6.74	33.17	53.36	31.26			
BLDR 003	11.64	41.62	59.28	40.80			
BLDR 004	29.39	59.83	61.85	37.51			
BLDR 005	32.16	17.61	64.62	38.68			
BLDR 006	16.70	21.16	64.19	52.89			
BLDR 007	40.00	86.51	75.56	45.71			
BLDR 008	77.36	9.37	82.73	50.98			
BLDR 009	9.19	25.43	39.12	30.78			

BLDR 010	44.13	94.59	59.14	51.12			
BLDR 011	29.83	27.77	68.21	37.09			
BLDR 012	11.44	60.97	69.62	53.70			
BLDR 013	13.98	14.23	52.62	38.93			
BLDR 014	12.52	38.02	41.40	35.33			
BLDR 015	6.29	85.44	55.64	29.81			
BLDR 016	21.72	98.83	78.94	61.89			
BLDR 017	18.46	65.70	56.13	46.94			
BLDR 018	14.66	43.34	73.22	71.63			
BLDR 019	30.31	60.60	88.29	54.48			
BLDR 020	11.00	28.10	29.22	19.39			
BLDR 021	20.83	46.55	77.55	39.53			
BLDR 022	25.85	33.88	49.75	44.75			
BLDR 023	9.42	29.78	54.79	39.98			
BLDR 024	19.51	46.70	67.66	45.24			
BLDR 025	15.29	83.76	53.89	37.93			
BLDR 026	35.02	35.88	93.92	57.94			
BLDR 027	10.62	37.71	91.79	56.88			
BLDR 028	12.85	28.07	83.48	49.18			
BLDR 029	23.11	17.03	88.49	56.37			
BLDR 030	23.24	47.73	62.40	40.40			
BLDR 031	115.25	58.64	81.98	38.26			
BLDR 032	24.21	28.57	92.06	48.36			
BLDR 033	11.88	38.64	36.46	25.51			
BLDR 034	10.60	27.68	50.93	37.49			
BLDR 035	27.30	47.48	116.29	64.31			
BLDR 036	9.66	51.15	69.63	48.70			
BLDR 037	13.57	35.87	62.23	30.35			
BLDR 038	36.01	120.14	122.64	56.97			

BLDR 039	13.90	29.72	67.51	36.23			
BLDR 040	6.82	64.62	67.66	50.28			
BLDR 041	10.00	141.59	103.07	92.10			
BLDR 042	282.38	71.35	596.49	118.71			
BLDR 043	22.19	903.92	88.19	40.90			
BLDR 044	49.00	267.51	123.31	91.68			
BLDR 045	23.15	146.25	95.40	113.09			
BLDR 046	9.03	80.67	35.83	37.79			
BLDR 047	8.49	45.79	48.04	39.28			
BLDR 048	12.84	32.84	50.89	35.63			
PDAC 001	12.43	9.56	74.68	49.04			
PDAC 002	32.83	121.93	123.30	64.47			
PDAC 003	14.72	51.44	96.60	50.55			
PDAC 004	8.03	108.78	94.89	65.71			
PDAC 005	8.86	26.77	91.48	54.61			
PDAC 006	21.09	51.10	74.98	56.10			
PDAC 007	59.82	27.50	107.19	58.53			
PDAC 008	11.62	109.86	79.82	56.31			
PDAC 009	7.11	25.35	41.95	39.31			
PDAC 010	27.48	25.72	570.87	28.22			
PDAC 011	91.77	43.81	146.64	45.11			
PDAC 012	15.37	77.17	61.42	48.48			
PDAC 013	11.04	83.98	56.32	38.08			
PDAC 014	26.38	31.40	72.31	34.21			
PDAC 015	28.62	88.89	83.59	47.77			
PDAC 016	15.98	61.69	99.29	52.29			
PDAC 017	118.75	78.89	80.57	44.73			
PDAC 018	14.55	73.54	114.18	69.63			
PDAC 019	24.91	38.39	106.43	50.75			

PDAC 020	11.99	106.21	61.31	40.04			
PDAC 021	9.82	56.57	67.38	41.99			
PDAC 022	21.26	35.99	105.38	55.04			
PDAC 023	14.94	99.84	90.59	58.21			
PDAC 024	14.94	41.95	124.34	46.53			
PDAC 025	15.72	105.51	98.79	36.19			
PDAC 026	107.66	135.17	190.30	49.30			
PDAC 027	18.23	21.54	93.61	38.08			
PDAC 028	20.22	73.46	166.32	66.95			
PDAC 029	8.84	62.90	54.75	74.68			
PDAC 030	19.56	74.61	92.75	42.71			
PDAC 031	9.26	36.03	63.27	39.00			
PDAC 032	17.37	8.49	59.45	36.54			
PDAC 033	13.53	60.53	49.82	44.40			
PDAC 034	18.12	32.05	46.47	39.38			
PDAC 035	10.68	115.72	71.45	46.78			
PDAC 036	30.90	89.23	71.95	44.20			
PDAC 037	16.89	0.05	25.23	12.87			
PDAC 038	28.14	28.72	50.46	41.99			
PDAC 039	47.07	51.74	94.53	66.48			
PDAC 040	15.32	22.18	63.60	50.21			
PDAC 041	216.54	92.44	174.49	104.04			
PDAC 042	23.45	0.05	94.76	36.92			
PDAC 043	6.07	84.54	46.37	45.69			
PDAC 044	21.30	51.27	109.23	44.55			
HC 001	21.86	15.65	83.18	56.14			
HC 002	13.25	9.90	53.97	36.71			
HC 003	13.41	11.92	40.77	38.41			
HC 004	20.15	16.94	48.49	49.81			
HC 005	10.92	95.04	63.99	45.19			
HC 006	41.48	12.81	75.41	62.28			

HC 007	12.72	31.34	69.29	45.99			
HC 008	9.58	19.80	46.41	47.91			
HC 009	5.77	29.51	54.78	55.31			
HC 010	9.03	19.82	47.66	50.43			
HC 011	6.07	29.47	59.39	60.61			
HC 012	5.11	109.57	43.60	47.74			
HC 013	5.92	127.25	51.50	51.56			
HC 014	5.04	118.28	51.83	55.21			
HC 015	6.26	138.72	55.62	51.96			
HC 016	13.90	79.93	54.33	48.31			
HC 017	14.06	62.01	51.72	35.88			
HC 018	18.52	83.02	78.83	59.40			
HC 019	18.04	92.32	67.95	58.35			
HC 020	22.90	87.71	58.10	56.34			
HC 021	10.13	109.43	51.77	40.33			
HC 022	11.16	101.15	54.69	38.03			
HC 023	9.50	107.73	49.51	39.46			
HC 024	11.60	108.22	50.62	36.94			
HC 025	11.08	35.37	47.61	44.50			
HC 026	26.31	36.42	105.73	62.09			
HC 027	40.00	78.33	50.96	51.12			
HC 028	33.24	69.12	52.16	46.75			
HC 029	11.56	28.35	43.02	41.17			
HC 030	44.53	52.37	121.38	110.60			
HC 031	51.12	131.32	93.26	101.97			
HC 032	13.75	54.57	108.99	102.46			
HC 033	20.35	36.07	98.76	107.23			
HC 034	84.91	1028.00	109.15	64.43			
HC 035	11.31	39.58	114.46	115.22			
HC 036	34.47	46.74	91.44	85.14			
HC 037	41.17	409.84	90.91	61.53			
HC 038	30.25	106.71	99.50	66.43			
HC 039	25.02	35.57	83.72	70.03			
HC 040	26.21	122.26	74.18	60.82			
HC 041	58.90	127.80	126.88	98.54			
HC 042	24.41	59.36	70.16	44.69			
HC 043	54.03	32.13	56.78	48.16			
HC 044	25.55	93.43	58.00	39.48			
HC 045	16.70	66.53	46.40	30.09			
HC 046	13.81	78.35	37.16	53.44			
HC 047	18.45	94.45	58.96	72.02			
HC 048	16.60	92.69	53.77	69.63			
HC 049	18.68	23.85	62.96	58.65			
HC 050	34.20	31.10	90.65	75.75			

HC 051	24.55	27.20	81.09	68.28			
HC 052	31.21	17.39	45.18	46.45			
HC 053	16.32	124.50	84.71	54.45			
HC 054	14.09	125.30	77.50	53.89			
HC 055	11.51	27.49	57.87	47.64			
HC 056	8.17	33.62	36.14	41.80			
HC 057	39.12	25.70	122.23	68.15			
HC 058	35.35	37.05	90.47	50.66			
HC 059	23.72	78.56	80.38	53.86			
HC 060	61.93	127.41	72.10	48.46			
HC 061	50.65	112.27	64.75	45.95			
HC 062	27.78	74.61	92.77	43.20			
HC 063	30.55	76.73	98.26	46.58			
HC 064	5.53	40.79	46.68	41.21			
HC 065	58.57	51.14	72.92	32.09			
HC 066	46.73	126.37	106.65	58.49			
HC 067	12.74	78.62	125.64	85.12			
HC 068	43.47	63.20	68.70	59.98			
HC 069	30.91	80.59	103.01	56.28			
HC 070	31.09	69.18	73.74	53.41			
HC 071	25.38	18.17	69.64	40.27			
HC 072	30.43	78.04	82.22	60.94			
HC 073	47.05	20.07	73.48	47.64			
HC 074	33.59	19.65	73.79	44.58			
HC 075	38.00	19.33	69.86	42.64			
HC 076	32.25	23.41	117.43	56.28			
HC 077	112.29	441.19	71.67	62.65			
HC 078	136.62	470.09	71.74	64.37			
HC 079	18.16	20.49	111.10	54.55			
HC 080	132.79	467.50	70.69	61.13			
HC 081	17.76	23.09	116.33	55.87			
HC 082	21.37	20.41	71.68	59.10			
HC 083	21.48	84.35	132.96	61.38			
HC 084	3.86	27.42	70.06	59.13			
HC 085	4.58	25.04	66.17	53.01			
HC 086	86.79	81.10	89.19	47.05			
HC 087	16.03	18.57	54.42	40.65			
HC 088	22.78	21.68	76.51	45.39			
HC 089	19.15	27.56	62.56	50.90			
HC 090	16.66	26.84	66.07	52.35			
HC 091	29.94	26.68	71.99	59.70			
HC 092	19.96	25.90	74.65	53.60			
HC 093	34.32	25.79	89.22	51.65			
HC 094	34.75	93.23	67.36	58.43			

HC 095	29.12	87.75	58.50	56.80			
HC 096	39.61	93.13	62.06	53.92			
HC 097	47.23	64.26	55.68	52.75			
HC 098	31.52	39.49	86.29	54.48			
HC 099	15.34	23.47	87.79	63.42			
HC 100	16.60	100.91	58.86	45.39			
HC 101	26.43	102.72	92.10	83.91			
HC 102	16.48	88.66	80.83	68.50			
HC 103	9.73	81.29	68.99	41.27			
HC 104	5.63	17.40	34.17	19.60			
HC 105	0.03	0.05	0.16	0.04			
HC 106	18.31	85.64	87.52	77.84			
HC 107	13.67	169.88	75.93	58.07			
HC 108	10.28	0.05	32.08	0.04			
HC 109	30.91	91.26	65.18	48.02			
HC 110	26.82	100.10	91.12	63.67			
HC 111	43.88	87.38	64.52	56.43			
HC 112	50.62	148.18	109.01	90.03			
HC 113	14.65	109.42	95.72	52.43			

[00202] To calculate the overall average ROC (FIG. 9B, Methods), 100 computational iterations were conducted. For each iteration, the total dataset from Table 5 was randomly split into 2/3 Training and 1/3 Test sets. Training sets were used for generation of regression coefficients for each of the biomarkers; Test sets were used to generate Receiver-Operator-Characteristic (ROC) curves and AUC statistics. This rigorous statistical analysis identified 13 proteins that, when combined with patient age, could effectively identify early-stage cancer (FIG. 9C, Tables 2, 6). The resulting average ROC curve is shown in FIG. 10A. When the overall cancer cohort was compared with the healthy individuals using the EXPLORE test, the average AUC was found to be 0.95 (95% CI = 0.94-0.97), with a mean sensitivity of 71.2% at specificity >99%.

Table 6: Logistic Regression Model Coefficients

Feature	Logistic Regression Coefficient	Standard Error
CA 19-9	1.87	0.04
Cathepsin D	-2.07	0.05
Ferritin	1.52	0.03
IGFBP3	-2.26	0.06
MIA	2.62	0.07
MPO	-1.15	0.04
sc-Kit/SCFR	-1.03	0.05
sE-selectin	-1.83	0.06
sFAS	-1.41	0.04
sHER2	0.3	0.01
sNeuropilin-1	0.97	0.03
sVEGFR1	-0.62	0.06
TIMP1	1.15	0.04
Donor Age	0.17	0

[00203] The 13 exo-protein biomarkers used in the EXPLORE test span a wide range of biological functions that may represent pivotal points in cancer development. Neuropilin-1 and HER2 are thought to mediate aberrant growth factor signaling in early malignancies (Niland, S. & Eble, J.A. Neuropilins in the Context of Tumor Vasculature. International Journal of Molecular Sciences 20, 639 (2019); Moasser, M.M. The oncogene HER2: its signaling and transforming functions and its role in human cancer pathogenesis. Oncogene 26, 6469-6487 (2007)). CA 19-9, MPO and TIMP-1 were previously identified in another multi-cancer assay (Liu, M.C., et al. Sensitive and specific multi-cancer detection and localization using methylation signatures in cell-free DNA. Annals of

Oncology 31, 745-759 (2020)). VEGFR1, sc-kit/SCFR and sE-selectin may affect angiogenesis (Dvorak, H.F. Vascular Permeability Factor/Vascular Endothelial Growth Factor: A Critical Cytokine in Tumor Angiogenesis and a Potential Target for Diagnosis and Therapy. Journal of Clinical Oncology 20, 4368-4380 (2002); Lennartsson, J. & Rönnstrand, L. Stem cell factor receptor/c-Kit: from basic science to clinical implications. Physiol Rev 92, 1619-1649 (2012); Kjaergaard, A.G., Dige, A., Nielsen, J.S., Tønnesen, E. & Krog, J. The use of the soluble adhesion molecules sE-selectin, sICAM-1, sVCAM-1, sPECAM-1 and their ligands CD11a and CD49d as diagnostic and prognostic biomarkers in septic and critically ill non-septic ICU patients. Apmis 124, 846-855 (2016)) while exosomal Cathepsin-D, MIA, IGFBP3, sFas and ferritin are known to impact tumor progression (Hoshino, A., et al. Extracellular Vesicle and Particle Biomarkers Define Multiple Human Cancers. Cell 182, 1044-1061.e1018 (2020); Hoshino, A., et al. Tumour exosome integrins determine organotropic metastasis. Nature 527, 329-335 (2015)) (Tables 6, 7). Waterfall plots for each of the exo-proteins mentioned are shown in FIG. 14 and FIG. 15 shows that the EXPLORE exo-proteins more accurately predict the presence of cancer than their equivalent free-proteins (0.95 vs. 0.85 AUC).

[00204] A key feature of a viable screening test is the ability to accurately detect early-stage cancer. At >99% specificity (where only 1 out of 110 healthy falsely identified as positive – Table 2), the EXPLORE test demonstrated sensitivities of 70.4% and 72.3% for stage I and II patients across all cancers, respectively (FIG. 10B). When analyzed by cancer type at >99% specificity, the EXPLORE test demonstrated 69% and 51% sensitivities in ovarian and bladder cancers, respectively, and a notable 96% sensitivity for detecting early-stage pancreatic cancer (FIG. 10C). Unlike previously described multi-cancer assays, EXPLORE demonstrated remarkable sensitivity in detecting early-stage disease in these challenging cancers.

[00205] To further understand the potential clinical significance of the EXPLORE test, performance was evaluated at stage and histological breakdowns for each cancer and compared mean sensitivities at three specificity levels used in various screening assays (99%, 97%, 95%).

[00206] The test demonstrated near-perfect sensitivities in detecting both the 21 Stage I (97%, 98%, 99%) and 23 Stage II (95%, 96%, 97%) in PDAC patients at the highest levels of specificity (FIG. 11A), indicating a potentially dramatic clinical impact. Detection of stage I ovarian cancer (N=37) was also at potentially clinically impactful levels (65%, 69%, 76%), with significant gains in sensitivity observed for lower specificities. Crucially, the high sensitivity of detection for both stage IA (n=25, 66%, 69%, 75%), and the lethally aggressive serous adenocarcinoma histologies (stage I/II, n=22, 69%, 73%, 80%) clearly demonstrates the potential value of the EXPLORE test in ovarian cancer (FIG. 11B). Early detection of either subtype could drastically impact survival rates

as surgery would be curative. In bladder cancer, the test was able to detect equally the 27 stage I patients (56%, 61%, 67%), 15 low-grade (52%, 58%, 68%), and 33 high-grade cancers (50%, 54%, 62%), within the 95% CI across all three specificities (FIG. 11C). Interestingly, given a ~4% reduction in specificity from >99% to 95%, all three subtypes showed a dramatic increase in mean sensitivity, 11%-16%. Taken as a whole, these results suggest that the EXPLORE test is not biased toward any sub-cohort within each cancer.

[00207] While pancreatic and ovarian cancer detection requires ~99% specificity to be viable for population-level screening, an argument could be made that bladder cancer may benefit from a lower specificity threshold. Late-stage bladder cancer has a significant impact on quality of life and is among the most expensive to treat in the US. A test with a higher sensitivity may help reduce burden on both patients and the healthcare system by detecting more positives at an early stage where treatment is simpler. The additional false positives (due to lower specificity) could be mitigated by use of non-invasive urine-based confirmatory tests.

[00208] In summary, a non-invasive test has been developed combining 13 exosomal proteins with age, a known cofactor in cancer, to detect stage I and II pancreatic, ovarian, and bladder cancers.

[00209] The three cancer types studied herein (pancreatic, ovarian and bladder) are estimated to account for roughly 88,000 deaths in the US in 2021, representing approximately 14% of all cancer-related deaths.

[00210] *Methods*

[00211] Sample Collection and Processing

[00212] All specimens for this study were obtained from a commercial biorepository (ProteoGenex, Culver City, CA, USA). Peripheral blood was collected under appropriate Institutional Review Board/Independent Ethical Committee approval, and all subjects filed informed consent. All subjects with confirmed diagnosis of cancer were treatment naïve (prior to surgery, local, and/or systemic anti-cancer therapy) at the time of blood collection. Demographics, surgical, and pathology information, and AJCC stage (7th edition) were provided by the biorepository and reviewed for accuracy by study authors. Since ovarian cancer patients did not uniformly undergo comprehensive surgical staging, an occult disease higher than the indicated stage cannot be ruled out. A total of 249 subjects were included in the study, including 136 subjects ('Cancer cohort patients') who were diagnosed with one of the three cancers between January 2014 and September 2020. In the cancer cohort, whole venous blood specimens were collected shortly after cancer diagnosis (median 1 day, mean 2.7 days), and prior to surgical intervention, radiation therapy, or cancer-related systemic therapy. Median age was 59 years [IQR 54-67] in subjects with known cancer diagnosis (n=136, 56 males, 82 females) and 53 years [IQR 45-61] in subjects

without known cancer history (n=113, 49 males and 64 females, Table S1). Whole blood samples were collected in K2EDTA plasma vacutainer tubes and processed into plasma within 4 hours of collection. The whole blood was double spun at 1,500 x g for 10 minutes at 4°C with no brake used. After the first spin, plasma was transferred into fresh tubes and subjected to a second spin at 1,500 x g for 10 minutes. After the second spin, plasma was aliquoted into 1mL tubes and frozen within 1 hour at -80°C. All specimens used in this study were processed under identical conditions.

[00213] Exosome Isolation and Particle Characterization

[00214] Exosomes were extracted from 240 µL of plasma as previously described using an AC Electrokinetic-based isolation method (Biological Dynamics, CA, USA). Briefly, undiluted plasma was introduced to a Verita™ chip, where exosomes were captured on microelectrodes. With the AC Electrokinetic field still activated to maintain capture, the remaining plasma was washed away. The AC Electrokinetic field was then deactivated, releasing the exosomes from the microelectrodes, and the solution containing the isolated exosomes was eluted for proteomic analysis. This method has also been used previously for the isolation of cell-free DNA, exosomal RNA and for detection of both solid-tumors and hematological malignancies. Following extraction, EVs were characterized using nanoparticle tracking analysis (NTA) via ZetaView instrument (Particle Metrix, Inning am Ammersee, Germany). Table 3 shows the particle size and concentration values for the exosomes isolated.

[00215] Proteomic Analysis

[00216] Bead-based immunoassay kits (Human Circulating Biomarker Magnetic Bead Panel 1 (Cat # HCCBP1MAG-58K), Human Angiogenesis Magnetic Bead Panel 2 (Cat # HANG2MAG-12K), and Human Circulating Cancer Biomarker Panel 3 (Cat # HCCBP3MAG-58K)) were procured from a commercial source (Millipore Sigma, Burlington, MA). Extracted exosomes samples and free proteins were tested for concentration of target proteins on a MAGPIX system (Luminex Corp, Austin, TX). Belysa software v. 3.0 (Luminex) was used to determine final protein concentrations.

[00217] EXPLORE Test Development

[00218] Following an initial evaluation of 54 proteins, 42 different biomarkers were selected for further analysis (Tables 4 & 5). In cases with missing values or results below the limit of detection (LOD), values for that protein were set (imputed) to the LOD. Distributions for all biomarkers were evaluated. Given the wide range of relevant concentrations and the imputed LOD values among the biomarkers, distributions were found to be highly skewed. Thus, a log2 transformation of all exosomal protein biomarker values was used in subsequent analyses. The R modules 'outlier' and 'GmAMisc' were used for assessments of outlying values based on standard Grubbs and related

tests and found evidence for some extreme values, but none reaching statistical significance, given the number of tests pursued and a conservative Bonferroni correction of relevant p-values. An analysis of outlying individuals based on their biomarker profiles relative to other individuals in the sample was also pursued. Euclidean distance matrices were built across the individuals using the 'hclust' module in R. One individual was identified whose profile was extreme relative to the others and this individual was removed from further analyses. The correlations among the biomarkers were explored using the R module 'Corrplot' to determine the potential for multicollinearity in building classification models (correlation plots from all the biomarkers measures are shown in FIG. 16). Both standard student t-tests, Wilcoxon non-parametric t-tests, and ANOVA for each biomarker were pursued to explore its association with cancer diagnosis using the R module 'stats' (Table 8). The results of these analyses, an assessment of missing and imputed values, and a qualitative literature-based assessment of the biological relevance of each biomarker were used to guide the choice of biomarkers to be evaluated in logistic regression analyses.

[00219] Logistic Regression and Receiver-Operator Characteristic Curve (ROC) Analyses.

[00220] A logistic regression-based classification models was developed using biomarkers with the 'caret' package in R, which is referred to as 'EXPLORE'. To pursue a fair assessment of the models, given the relatively small sample size, and to avoid overfitting, 100 random partitions of the data were generated with 66% devoted to a training set and 33% devoted to a test set to evaluate the performance of the EXPLORE classification model (FIG. 9B). Receiver-Operator Characteristic ROC Curves, Area Under the Curve (AUC), and related metrics were computed. The ROC curve and AUC analyses of the training sets resulted in, as expected, better prediction values than those obtained from the test set analyses, but clearly reflected the potential for overfitting. Therefore, the performance of the models is reported based on the training data sets and focus on the performance from the test sets. The resulting models were also used to assess EXPLORE's ability to correctly detect individuals with different cancers and stages of cancer, as well as compare models based on free as opposed to exosome protein levels. During the evaluation of the logistic regression modules, the influence of each individual's profile on the resulting module was assessed using, e.g., leverage statistics in the R module 'car.' Based on these analyses, 4 individuals had consistently large influence on the models and, although improvements in the model performance were achieved when these individuals were removed from analyses, this improved performance was not statistically significant from the performance of a model that retained these individuals (data not shown). To ensure robustness of the model and its performance evaluations in

subsets of individuals with different cancers and stages, these individuals were excluded from all further analyses.

[00221] Automated Classifier Analyses.

[00222] As a complement to the choice of biomarkers for use in the classifier, the use of stepwise logistic regression and LASSO-based logistic regression was considered for automated choice of biomarkers in classification models using the R modules 'caret' and 'glmnet'. The performance of the classifiers resulting from the application of these methods did not significantly improve the results, likely due to the small sample size and the multicollinearity among the biomarkers.

[00223] Additional Analysis and Plotting

[00224] Additional analysis and plotting in both the main text and the supplemental information was done in GraphPad Prism (Version 9.0.2) and JMP (Version 14.1.0).

EXAMPLE 5: Preparation of ACE-Purified Exosome Samples for Mass Spectrometry Analysis

[00225] Existing standard methods for the preparation of protein samples for mass spectrometry analysis are not sufficient to extract proteins from exosomes, due to the very low buoyant density and tough lipid exterior of exosomes. Furthermore, the components of some elution buffers used to collect exosomes from the ACE chip sometimes presents challenges to standard sample preparation methods for mass spectrometry. Therefore, the following methods were employed to ensure efficient extraction of the full range of proteins to be analyzed.

[00226] Using the elution protocol described above, exosomes were purified from human plasma using three separate chips, collected in elution buffer, and then, pooled. To lyse the exosomes, 100 µL of sample was added to 900 µL of lysis buffer containing the following: (1) detergents such as 2% octylglucoside; (2) protease inhibitors such as phenylmethylsulfonyl fluoride (PMSF), leupeptin, and/or ethylenediaminetetraacetic acid (EDTA); (3) phosphatase inhibitors such as sodium orthovanadate; and (4) denaturing agents such as 4-8 M urea. The mixture was vortexed for 5 minutes followed by probe sonication comprised of 3 separate pulses of 5 seconds each, with the probe set at 20% of the full power. To remove insoluble debris, protein samples were subjected to centrifugation for 10 minutes at 12,000 rpm, and supernatants containing the extracted proteins were collected. Protein disulfide bonds were reduced by the addition of 100 mM dithiothreitol (DTT), followed by alkylation using iodoacetamide. All proteins were precipitated from the sample mixture by addition of trichloroacetic acid (TCA).

[00227] To remove any residual TCA, the precipitated sample was washed twice with ice-cold acetone. If the sample pH remained too low, it was adjusted towards neutral by addition of NH_4HCO_3. Then, the sample was subjected to two separate enzymatic digestions, first using Lys C enzyme overnight at 37°C followed by trypsin for 6 hours at 37 °C. To desalt the resulting mixture

of peptides, samples were run through a Waters C18 HPLC column, washed with aqueous solution, and eluted using acetonitrile. Peptides were quantified using a Pierce Pepquant kit, and 50 µg of each sample was subjected to mass spectrometry analysis.

[00228] Biomarker proteins identified *via* mass spectrometry analysis of ACE-purified exosomes (Table 7), using the sample preparation method outlined above:

Table 7: Exoverita – Proteins of Interest elevated in pancreatic cancer *vs.* healthy plasma exosomes	
Tetraspanin	Ras-related protein Rab-5C
Sorbin and SH3 domain containing protein	GTP-binding nuclear protein Ran (Fragment)
Leucine-rich alpha-2-glycoprotein	Versican core protein
(Fibulin-3)	Ras GTPase-activating protein 3
Vascular cell adhesion protein 1	Phosphatidylinositide phosphatase SAC1
Periostin	Annexin A3
Thrombospondin-4	Tenascin-X

EXAMPLE 6: Early Stage Multi-Cancer Detection Using Extracellular Vesicle Protein-Based Blood Test

[00229] Extracellular vesicles (EV) were isolated from both control plasma and plasma from stage I and II pancreatic, ovarian, and bladder cancer cases (**FIG. 17**). EV populations isolated using the alternating current electrokinetic (ACE) technology are consistent with the presence of exosomes, in accordance with the ISEV 2018 guidelines24 (mean particle sizing ~ 120 nm; CD63-positive; TSG101 can be detected only following membrane permeabilization; scanning electron microscope (SEM) images display rounded, cup-shaped morphology; contain functional RNA). After EV isolation, the particle size distribution and concentration were measured and equivalent isolation for both cohorts was confirmed (**FIGS. 22A-22C**). To simulate a real-world screening scenario, all cancer cases were treatment-naïve; to ensure that these were early-stage patients, histopathologic staging was confirmed using the American Joint Commission on Cancer (AJCC) guidelines. The median age of the cancer cases was 60 years (59.7% female, 40.3% male). Notably, 63.3% of the overall cancer cases were stage I, with the remaining 36.7% at stage II. Furthermore, the stage I ovarian cohort was comprised predominantly (60%) of stage IA samples. The control group had no known history of cancer or autoimmune disease, with a median age of 57 years (50.0% female, 50.0% male).

[00230] To evaluate the advantages of using ACE-isolated EVs for proteomic analysis, EVs were isolated from a subset of case and control patient samples using either ACE or a differential ultracentrifugation method (**FIG. 17**). Following isolation, the only physical difference observed between the two methods was a slight decrease in average particle size for EVs isolated on using ACE (138 nm for UC versus 120 nm for ACE EVs; **FIG. 18A**). Further breakdown of the particle size distributions is shown in **FIGS. 23A-23B**. When EVs prepared by the two methods were assessed for total plasma protein content, the UC EV preparations were found to contain much higher levels than the ACE EVs (**FIG. 18B**). For example, contamination with the plasma protein IgG was much higher in the UC isolated material (**FIGS. 23A-23B**). This is consistent with previous reports that UC-prepared EVs co-purify with protein and nucleic acid aggregates. When EVs purified by the two different methods were compared for their protein biomarker signals we found a strong differentiation between cases and controls for two key biomarkers (CA19-9 and CA 125) from the ACE-isolated EVs, but not for the UC-isolated EVs (**FIG. 18C**). A summary of the measurements for the EVs from both isolation techniques is shown in **Table 8**. These results suggests that the ACE EV isolation can be a suitable tool for the purification of EVs directly from plasma and may thus provide a relevant avenue for proteomic analysis. Furthermore, EV isolation using ACE is more efficient, the entire process takes about 2 hours since no added pre- or post-processing steps are required, it does not rely on immunoaffinities, and it involves less of the sample handling which can damage the EVs. Most importantly, unlike UC, ACE isolation of EVs has the potential to be integrated into high-throughput, automated systems.

Table 8: Donor histopathology and results for comparison to ultracentrifugation

ID	Method	Cohort	Sex	Age	AJCC Stage	A/B/C	T	N	M	Histopathology	Protein Concentration Qubit™ Assay (ng/μL)	Particle Concentration (Particles/mL)	Median Particle Size (nm)	Peak Particle Size (nm)	CA 19-9 (U/mL)	CA-125 (U/mL)
UC1	Veritа™	Ovarian	F	53	I	A	T1a	N0	M0	serous papillary cystadenocarcinoma	661.5	4.8E+10	120.1	119.27	3.96	1.58

UC2	Verita™	Ovarian	F	37	II	B	T2b	N0	M0	serous cystadenocarcinoma	1010	4.73E+11	110.7	112.73	25.99	9.2
UC3	Verita™	Ovarian	F	43	I	A	T1a	N0	M0	clear cell adenocarcinoma	418	7.2E+10	121.9	124.9	35.01	40.69
UC4	Verita™	Ovarian	F	55	II	B	T2b	N0	M0	serous adenocarcinoma	563	3.25E+10	112.05	110	0.73	186.81
UC5	Verita™	Bladder	M	68	II		T2a	N0	M0	urothelial carcinoma	398.33	1.34E+11	133.03	131.53	1.57	1.44
UC6	Verita™	Bladder	F	45	II		T2b	N0	M0	urothelial carcinoma	380	1.15E+11	135.93	137.67	1.95	4.09
UC7	Verita™	Bladder	M	69	I		T1	N0	M0	urothelial carcinoma	381	3.93E+10	119.6	125.77	7.58	1.22
UC8	Verita™	Bladder	M	68	II		T2a	N0	M0	urothelial carcinoma	445.67	1.44E+11	111.8	115.63	6.22	5.59
UC9	Verita™	Pancreatic	M	60	II	A	T3	N0	M0	adenocarcinoma	371	1.18E+11	111.3	116.27	273.64	63.96
UC	Verita™	Pancreatic	F	59	II	A	T3	N0	M0	adenocarci	400.5	2.93E+11	115.43	116.57	19.44	1.38

10										noma						
UC11	Veritа™	Pancreatic	M	66	II	B	T3	N1	M0	adenocarcinoma	474	4.3E+11	117.6	117.3	1.7	0.76
UC12	Veritа™	Pancreatic	F	58	II	B	T3	N1	M0	mucinous adenocarcinoma	502	2.2E+11	118.4	121.5	5.47	2.2
UC13	Veritа™	Pancreatic	M	67	II	B	T3	N1	M0	adenocarcinoma	462	2.21E+11	121.9	123.2	100.72	24.17
UC14	Veritа™	Pancreatic	F	70	II	B	T2	N1	M0	adenocarcinoma	343	4E+11	127.03	128.03	85.83	21.88
UC15	Veritа™	Control	F	62							372.67	1.83E+11	123.4	124.13	0.83	0.38
UC16	Veritа™	Control	F	60							825.5	7.4E+11	117.23	114.47	1.1	0.51
UC17	Veritа™	Control	F	58							806.5	3.75E+11	130.5	133.65	3.27	0.61
UC18	Veritа™	Control	F	61							673	4.57E+11	127.97	127.43	1.94	0.46
UC19	Veritа™	Control	F	55							756.5	3.55E+11	128.55	129.05	4.37	0.68
UC20	Veritа™	Control	F	60							561	1.3E+11	117.35	117.4	1.3	0.71
UC21	Veritа™	Control	F	58							257	3.3E+10	121.4	112.8	2.66	1.9
UC	Veritа™	Control	M	60							931.5	3.09E+11	125.17	127.47	0.35	0.6

22															
UC23	Veritа™	Control	M	58						429.5	3.18E+11	110.8	113	0.45	1.25
UC24	Veritа™	Control	F	62						583.33	2.02E+11	111.23	114.6	0.82	0.69
UC25	Veritа™	Control	F	58						744.67	1.62E+11	114.13	118.2	0.73	0.69
UC1	DUC	Ovarian	F	53	I	A	T1a	N0	M0	serous papillary cystadenocarcinoma	617.67	9.83E+11	138.8	146.8	5.12	1.26
UC2	DUC	Ovarian	F	37	II	B	T2b	N0	M0	scrous cystadenocarcinoma	560	1.02E+12	141.17	147.57	13.74	1.67
UC3	DUC	Ovarian	F	43	I	A	T1a	N0	M0	clear cell adenocarcinoma	706.67	1.12E+12	143.07	154.03	19.15	2.56
UC4	DUC	Ovarian	F	55	II	B	T2b	N0	M0	serous adenocarcinoma	778.33	7.13E+11	135.97	139.43	5.25	5.67
UC5	DUC	Bladder	M	68	II		T2a	N0	M0	urothelial carcinoma	671.67	1.27E+12	127.4	134.33	2.02	0.39

UC6	DUC	Bladder	F	45	II		T2b	N0	M0	urothelial carcinoma	740.33	1.87E+12	157.1	170.47	3.78	1.03
UC7	DUC	Bladder	M	69	I		T1	N0	M0	urothelial carcinoma	684.33	1.27E+12	140.77	148.53	7.08	0.59
UC8	DUC	Bladder	M	68	II		T2a	N0	M0	urothelial carcinoma	603.67	8.93E+11	136.67	143	2.02	2.38
UC9	DUC	Pancreatic	M	60	II	A	T3	N0	M0	adenocarcinoma	640	3.84E+11	137.1	140.87	24.81	1.52
UC10	DUC	Pancreatic	F	59	II	A	T3	N0	M0	adenocarcinoma	789	7E+11	133.3	130.25	109.06	4.04
UC11	DUC	Pancreatic	M	66	II	B	T3	N1	M0	adenocarcinoma	633.5	8.4E+11	127.9	131.45	6.01	1.22
UC12	DUC	Pancreatic	F	58	II	B	T3	N1	M0	mucinous adenocarcinoma	791.33	6.25E+11	140.05	146.05	6.5	0.45
UC13	DUC	Pancreatic	M	67	II	B	T3	N1	M0	adenocarcinoma	636.33	8.9E+11	137.93	145.8	24.35	1.16
UC14	DUC	Pancreatic	F	70	II	B	T2	N1	M0	adenocarcinoma	697	5.8E+10	139.77	142.37	8.49	0.49
UC15	DUC	Control	F	62							828.67	1.28E+12	132.9	139.1	18.53	3.16

UC16	DUC	Control	F	60							672.67	4.03E+11	129.33	132.03	9.14	0.56
UC17	DUC	Control	F	58							400.5	4.53E+11	132.63	139.2	4.59	0.67
UC18	DUC	Control	F	61							599	7.79E+11	128.57	131.67	3.44	0.39
UC19	DUC	Control	F	55							688.33	3.17E+11	135.53	140.1	4.44	1.33
UC20	DUC	Control	F	60							823.33	5.73E+11	146	156.4	23.03	2.02
UC21	DUC	Control	F	58							639	5.33E+11	148.77	157.63	6.25	1.42
UC22	DUC	Control	M	60							800.33	6.03E+11	139	150.63	12.28	2.54
UC23	DUC	Control	M	58							787.67	9.57E+11	134.47	141.87	11.65	2.31
UC24	DUC	Control	F	62							903.67	8.73E+11	137.1	139.23	17.5	2.94
UC25	DUC	Control	F	58							827	1.17E+12	139.1	145	19.11	3.18

[00231] A case-control study involved measurements of the levels of 42 EV-associated protein biomarkers for both the study cohort cancer cases (47 pancreatic, 44 ovarian, 48 bladder) and the controls (184 controls) via a multiplex immunoassay, and an individual assessment of each protein level was performed (heatmaps of the normalized protein levels are shown in **FIGS. 24A-24B**). Additionally, levels of the unpurified, total circulating plasma proteins ("free proteins") were measured from the same study cohorts (**FIGS. 24A-24B**). To identify the EV-associated protein biomarkers with the largest differentiation potential, a selection process was employed to select the most relevant biomarkers based on very high specificities (> 99%) using Recursive Feature Elimination (RFE) with cross-validation. The use of repeated cross-validation worked best within

the limitations of the sample size for this pilot study (N=323). One hundred repetitions of 5-fold cross validation were performed (**FIG. 19**), and across all repetitions, the RFE algorithm used stepwise backwards selection to arrive at the optimal number of biomarkers that maximized the partial AUC (pAUC).31 By optimizing the p(AUC) between specificities of 0.75 to 1.00 the biomarker selection was tailored towards the reduction of false positive occurrences (a control mistakenly called as cancer), since this is critical for MCED-type approaches in order to reduce the costs associated with false positive testing. This strategy resulted in the selection of 13 EV protein markers. After the biomarkers were selected, the cohort was separated at random into a training set (67% of the samples) and a "hold-out" set (33% of the samples) stratified by cancer type (pancreatic, ovarian, and bladder) to estimate the respective coefficients for each biomarker in the logistic regression model exploring the potential for detection of cancer at early stages (**FIG. 19**). The individual logistic regression coefficients were estimated using the training set, while the performance was evaluated in the hold-out test set. Box plots comparing cases and controls for the 13 selected biomarkers are shown in **FIG. 25**, their coefficient and importance score is shown in **Table 9**, and their Pearson correlation coefficients in **Table 10** and **FIG. 26**.

Table 9: Logistic regression model coefficients

Feature	Logistic Regression Coefficient	Importance Score
CA 19-9	1.43	3.84
Cathepsin D	-1.85	2.92
Ferritin	1.17	2.48
sE-selectin	-1.53	1.54
IGFBP3	-1.23	1.54
MIA	1.24	1.50
CA 15-3	-0.90	1.43
sFAS	-1.04	1.12
TIMP1	0.83	1.11
sNeuropilin-1	0.46	0.99
Age	0.09	0.86
MPO	-0.52	0.68
CA 125	0.41	0.67
b-HCG	0.85	0.54

Table 10: Pearson correlation coefficients

Feature	CA 19-9	Cathepsin-D	Ferritin	sE-Selectin	IGFBP3	MIA	CA 15-3	sFAS	TIMP1
CA 19-9	1.00	0.01	0.06	-0.03	-0.04	0.10	0.02	0.00	0.01

Cathepsin D	0.01	1.00	0.14	0.06	0.34	0.38	0.00	0.07	0.47
Ferritin	0.06	0.14	1.00	0.07	0.27	0.20	-0.02	-0.06	0.21
sE-selectin	-0.03	0.06	0.07	1.00	-0.01	-0.06	-0.02	0.04	0.10
IGFBP3	-0.04	0.34	0.27	-0.01	1.00	0.34	-0.06	-0.10	0.28
MIA	0.10	0.38	0.20	-0.06	0.34	1.00	-0.03	0.02	0.56
CA 15-3	0.02	0.00	-0.02	-0.02	-0.06	-0.03	1.00	0.17	0.02
sFAS	0.00	0.07	-0.06	0.04	-0.10	0.02	0.17	1.00	0.01
TIMP1	0.01	0.47	0.21	0.10	0.28	0.56	0.02	0.01	1.00
sNeuropilin-1	0.04	0.02	0.13	0.72	0.03	-0.05	0.00	-0.02	0.04
Age	0.10	0.03	0.02	-0.06	-0.11	0.02	-0.07	-0.04	0.02
MPO	0.09	0.33	0.27	0.06	0.32	0.83	-0.04	-0.02	0.53
CA 125	0.10	-0.01	0.29	0.03	-0.04	0.01	0.21	-0.01	0.01
b-HCG	0.01	0.11	-0.07	0.02	-0.06	-0.04	0.23	0.35	0.01
Feature	**sNeuropilin**	**Age**	**MPO**	**CA-125**	**bHCG**				
CA 19-9	0.04	0.10	0.09	0.10	0.01				
Cathepsin D	0.02	0.03	0.33	-0.01	0.11				
Ferritin	0.13	0.02	0.27	0.29	-0.07				
sE-selectin	0.72	-0.06	0.06	0.03	0.02				
IGFBP3	0.03	-0.11	0.32	-0.04	-0.06				
MIA	-0.05	0.02	0.83	0.01	-0.04				
CA 15-3	0.00	-0.07	-0.04	0.21	0.23				
sFAS	-0.02	-0.04	-0.02	-0.01	0.35				
TIMP1	0.04	0.02	0.53	0.01	0.01				
sNeuropilin-1	1.00	-0.05	0.04	0.01	0.00				
Age	-0.05	1.00	0.05	-0.17	0.08				
MPO	0.04	0.05	1.00	0.04	-0.06				
CA 125	0.01	-0.17	0.04	1.00	-0.03				
b-HCG	0.00	0.08	-0.06	-0.03	1.00				

[00232] This performance evaluation was strengthened by employing the widely-used statistical process of resampling which better represents how a larger dataset will perform. By resampling, it was evaluated whether the initial random partition created an unrealistic model due to a rare distribution of subjects in that initial partition. One hundred training and test sets were randomly resampled (2/3 and 1/3 of the subjects, respectively) from the overall data and generated 100 individual logistic fits for the training portion; from these fits individual ROC curves were generated for the test sets (**FIG. 20A**). Likewise, each time a subject was featured in the hold-out test set, a fit for their logistic model was produced and subsequently averaged among all the times that specific subject was used in a test set and from these average fits the overall performance of the model was assessed. The performance for each of the 100 randomly partitioned test sets was assessed individually which, when an average threshold for the target specificity of > 99% is computed, permits determination of the overall average sensitivity and confidence intervals.

[00233] When the overall cancer case cohort was compared with the control individuals using the EV protein biomarker test, the average AUC was found to be 0.95 (95% CI = 0.92 to 0.97) as shown in **FIG. 20A**, with an average sensitivity of 71.2% (95% CI: 63.2 to 78.1) at a specificity of 99.5% (95% CI: 97.0 to 99.9), as shown in Table 11. For the average of the 100 test sets, the AUC for the exo-proteins was found to be larger than that of the equivalent plasma free-proteins (**FIG. 27**), at 0.95 vs. 0.87, respectively. When considered across all the three cancers studied, our EV protein test demonstrated sensitivities of 70.5% (95% CI: 60.2 to 79.0) and 72.5% (95% CI: 59.1 to 82.9) for stage I and II patients, respectively (**FIG. 20B**, Table 11). Furthermore, we analyzed the sensitivity at > 99% specificity for each individual cancer, finding values of 43.8% (95% CI: 30.7 to 57.7) for bladder cancer, 75.0% (95% CI: 60.6 to 85.4) for ovarian cancer and 95.7% (95% CI: 85.8 to 98.8) for pancreatic cancer (**FIG. 20C**). These results suggest that EV proteins have the potential for detecting early-stage cancers at screening-relevant sensitivities.

Table 11: Performance of Logistic Classifier using EV Proteins

Category	# Subjects	Specificity (%, 95% CI)	Sensitivity (%, 95% CI)
Control	184	99.5 (97.0-99.9)	
All Cancer Cases	139		71.2 (63.2-78.1)
Stage I	88		70.5 (60.2-79.0)
Stage II	51		72.5 (59.1-82.9)
Pancreatic Cancer	47		95.7 (58.8-98.8)
Ovarian Cancer	44		75.0 (58.9-85.4)

Bladder Cancer	48		43.8 (30.7-57.7)
Two-sided 95% Wilson confidence intervals			

[00234] The 13 EV protein biomarkers identified here span a wide range of biological functions that may represent pivotal points in cancer development. Neuropilin-1 and CA15-3 mediate aberrant growth factor signaling in early malignancies. CA 19-9, MPO and TIMP-1, known cancer drivers, were previously utilized in another multi-cancer test. Neuropilin-1 and sE-selectin are known drivers of angiogenesis processes37,38 while exosomal Cathepsin-D, MIA, IGFBP3, sFas and Ferritin have been shown to impact tumor progression. sFAS has been shown to promote cancer stem cell survival, and bHCG may regulate epithelial to mesenchymal transition events in ovarian cancer cell progression. Several of the proteins have previously been shown to be present in EVs. Total serum CA-125 is approved for use in monitoring treatment response and recurrence for ovarian cancer, but it is not recommended to be used as a screening marker. Similarly, total serum CA19-9 is FDA-approved for pancreatic cancer treatment and recurrence monitoring, but importantly, not for screening since on its own CA19-9 may be elevated in several benign conditions.

[00235] To further understand the potential utility of the EV protein-based test, performance was evaluated at stage for each cancer and compared sensitivities at the 99.5% specificity determined from the overall analysis. With the caveat that sample size for each cancer type was relatively small, the test demonstrated very high sensitivities in detecting both the 22 stage I (95.5%; CI: 78.2 to 99.2) and 25 stage II PDAC patients (96.0%, CI: 80.5 to 99.3) (**FIG. 21A**), indicating a potential breakthrough for the early detection of this malignancy. Detection of stage I ovarian cancer (N=39) was also at levels with potential clinical impact (74.4%, CI: 58.9 to 85.4) as shown in **FIG. 21B**. The ovarian cancer cohort was further broken down into both the lethally aggressive serous adenocarcinoma histology (stage I/II, N=22) and stage IA (N=26), showing sensitivities ranging from 68.2% (CI: 47.3 to 83.6) to 73.1% (CI: 53.9 to 86.3 CI) at >99% specificity, respectively. Early detection of either subtype could impact survival rates, as surgery would likely be curative. In bladder cancer, the test was able to detect the 27 stage I patients at 44.4% (CI: 27.6 to 62.7), and the 21 stage II patients at 42.9% (CI: 24.5 to 63.5) as shown in **FIG. 21C**. The lower sensitivities for bladder cancer, compared to the high sensitivities for pancreatic and ovarian cancer, may reflect the limited availability of suitable biomarkers for detecting early-stage bladder cancer in the panels that were evaluated. In addition, bladder cancer is known to have high molecular and histologic heterogeneity.

[00236] Taken as a whole, these results suggest that the EV-based protein biomarker test is not biased toward any sub-cohort within each cancer. While pancreatic ductal adenocarcinoma (PDAC) and ovarian cancer detection require ~99% specificity to be viable for population-level screening, an argument could be made that bladder cancer may benefit from a lower specificity threshold. In the emerging field of multi-cancer early detection (MCED) testing, this test is unique because while other tests have the potential to improve the prognosis for later-stage cancer, this test can provide higher sensitivity for detection of early-stage cancer, as exemplified by our 96% sensitivity for stage I and II PDAC cases.

[00237] As with any pilot study, there are limitations to acknowledge. First, while informative for biomarker discovery purposes, our relatively small sample cohort, and the inclusion of 100% early-stage tumors does not reflect realistic cancer population characteristics, and sensitivities may be lower when screening large, asymptomatic populations.5,8 However, since survival is directly linked to detecting cancer early, we decided to exclusively focus our cohort on stages I and II. Second, both cohorts are ethnically homogenous, with sex ratios that may be skewed in comparison to the general frequency observed in cancer between males and females.5 Third, our control population consisted of individuals without history of cancer or known confounding comorbidities (e.g., chronic pancreatitis) that in a true screening setting may yield additional false-positive results. Finally, this pilot study will require independent external validation using larger cohorts of blinded samples to verify the potential utility of this MCED approach.

[00238] In summary, we have developed a blood-based EV protein detection test and demonstrated its potential role in MCED. The EV protein biomarker test requires less than 500 µL of plasma and permits integration into an automated workflow. Using a non-invasive blood-based approach, we selected a panel of 13 EV proteins that along with age, a known cofactor in cancer,54 allowed detection of stage I and II pancreatic, ovarian, and bladder cancers with high diagnostic potential (AUC = 0.95). Most importantly, we obtained a sensitivity of 71.2% at high specificity (99.5%), a key factor for future screening efforts. This test is the first to effectively utilize EVs in early cancer detection via an AC electrokinetic, lab-on-a-chip, scalable platform. Because the VeritaTM platform has multi-omic detection capabilities, addition of other exo-proteins, exosomal mRNA, and/or circulating DNA biomarkers is possible.

[00239] MATERIALS & METHODS

[00240] *Sample Collection and Processing*

[00241] All specimens for this retrospective study were collected over a period of several years by a commercial biorepository (ProteoGenex, Inglewood, CA, USA). Stage I and II samples were

selectively obtained from available inventory. Samples had been collected from patients in hospital settings and following collection were maintained by the commercial biorepository. In the hospital settings, potential cancer patients were identified by any suspicious findings arising during imaging that was conducted either in response to patient symptoms or as part of routine, annual examinations. Information on which patients were symptomatic and which were asymptomatic was not available. Cancers were confirmed via subsequent tissue biopsy and staged by pathologists in the hospital using pathology and surgical reports, according to AJCC (7th edition) guidelines, along with imaging to assess any spread to distant sites. All subjects with confirmed diagnosis of cancer were treatment naïve (prior to surgery, local, and/or systemic anti-cancer therapy) at the time of blood collection. The biorepository provided the patient samples along with demographics, surgical, and pathology information. Through the analysis of these data, staging for patients was reviewed a second time for accuracy. Since ovarian cancer patients did not uniformly undergo comprehensive surgical staging, an occult disease higher than the indicated stage cannot be ruled out. The control group has no known cancer history, no known autoimmune diseases, or neurodegenerative diseases as well as no presence of diabetes mellitus (types 1 and 2). A total of 323 subjects were included in the study, including 139 subjects ('Cancer case patient cohort') who were diagnosed with one of the three cancers between January 2014 and September 2020. In the cancer case cohort, whole venous blood specimens were collected shortly before biopsy (median -1 day, mean -2.7 days), and prior to surgical intervention, radiation therapy, or cancer-related systemic therapy. Median age was 60 years [Min – Max 21-76] in the cancer case cohort (N=139, 56 males, 83 females) and 57 years [Min – Max 40-71] in the control cohort (N=184, 82 males and 82 females). Whole blood samples were collected in K2EDTA plasma vacutainer tubes and processed into plasma within 4 hours of collection. The whole blood was first spun at 1,500 x g for 10 minutes at 4°C with no brake used. After the first spin, plasma was transferred into fresh tubes and subjected to a second spin at 1,500 x g for 10 minutes. After the second spin, plasma was aliquoted into 1mL tubes and frozen within 1 hour at -80°C. All specimens used in this study were processed under identical conditions.

[00242] *EV/Exosome Isolation and Particle Characterization*

[00243] Isolation of EVs using AC Electrokinetics

[00244] EVs, including exosomes, were extracted from plasma as previously described using an AC Electrokinetic (ACE)-based isolation method (Biological Dynamics, CA, USA). Briefly, 240 µL of each undiluted plasma was introduced into a Verita™ chip, and an electrical signal of 7 Vpp and 14 KHz was applied while flowing the plasma across the chip at 3 µL/min for 120 min. EVs were captured onto the energized microelectrode array, and unbound materials were washed off the

chip with Elution Buffer I (Biological Dynamics) for 30 min at 3 μL/min. The electrical signal was turned off, releasing EVs into the solution remaining on the chip (35 μL), which was then collected, and the solution containing purified, concentrated/eluted EVs was used directly for further analysis. This method has also been used previously for the isolation of cell-free DNA, exosomal RNA and exosomal protein markers in both solid-tumors and hematological malignancies.25,26,55-58 The Verita-purified EVs were characterized using nanoparticle tracking analysis (NTA) via ZetaView instrument (Particle Metrix, Inning am Ammersee, Germany). **FIGS. 22A-22C** show the particle size and concentration values for the exosomes compared between the case and control cohorts.

[00245] Isolation of EVs via Differential Ultracentrifugation

[00246] A subset of case and control samples were subjected to differential ultracentrifugation as a conventional means of EV isolation. In brief, 760 μL of 1x PBS was added to 240 μL of each plasma, then spun successively at 500 × g for 10 min, 3000 × g for 20 min, and 12,000 × g for 20 min, collecting the supernatants after each step. Subsequently, the resulting supernatant was subjected to ultracentrifugation at 100,000 × g for 70 min, pellets were washed in 1x PBS and then ultracentrifuged again at 100,000 × g for 70 minutes. The supernatant was discarded, and the resulting pellet was resuspended in 120 μL of 1× PBS for further analysis.

[00247] *Protein Contamination Analysis*

[00248] To determine the presence of contaminating total protein in the EV preparations from both the Verita™ platform and the differential ultracentrifugation process, samples were analyzed using the Qubit 4 fluorometer (ThermoFisher Scientific, Waltham, MA) with the Qubit™ Protein quantitation assay (Cat No. Q33212, ThermoFisher Scientific, Waltham, MA), run according to manufacturer specifications. To further understand the composition of the contaminating proteins on the isolation products, the 2100 Bioanalyzer (Agilent, Santa Clara, CA) with the Protein 230 kit for protein analysis (Cat No. 5067-1517) was used following manufacturer's directions.

[00249] *Protein Biomarker Analysis*

[00250] Verita-isolated EV samples, as well as original, unpurified plasma samples from the same patients, were used directly in commercial multiplex immunoassays to quantify the presence of marker proteins. In brief, 2 X 35 μL of each purified EV sample was used for analysis by each of three different bead-based immunoassay kits, according to the manufacturer's directions for each kit (Human Circulating Biomarker Magnetic Bead Panel 1 (Cat # HCCBP1MAG-58K), Human Angiogenesis Magnetic Bead Panel 2 (Cat # HANG2MAG-12K), and Human Circulating Cancer Biomarker Panel 3 (Cat # HCCBP3MAG-58K); Millipore Sigma, Burlington, MA). Protein biomarker concentration was assessed using the MAGPIX system (Luminex Corp, Austin, TX)

according to manufacturer's protocols. Belysa software v. 3.0 (EMD Millipore) was used to determine final protein concentrations from the calibration curves. Limit of Detection (LOD) and units of measure for each of the biomarkers are listed in Table 12.

Table 12: Biomarker Limits of Detection

Biomarker Abbreviation	Protein Name	Limit of Detection	Units
Tenascin C	Tenascin C	20.2	pg/mL
sAXL	Soluble Axl receptor tyrosine kinase	5.6	pg/mL
sE-selectin	Soluble E-selectin	247.8	pg/mL
sHGFR/c-Met	Soluble human growth factor receptor	24.2	pg/mL
sHer2	Soluble human epidermal growth factor receptor 2	11.9	pg/mL
sHer3	Soluble human epidermal growth factor receptor 3	17.9	pg/mL
sIL-6Ra	Soluble interleukin 6 receptor a	15.1	pg/mL
sNeuropilin-1	Soluble Neuropilin-1	151	pg/mL
sPECAM-1	Soluble platelet-endothelial cell adhesion molecule-1	15.5	pg/mL
sVEGFR1	Soluble vascular endothelial growth factor receptor 1	5.1	pg/mL
sVEGFR3	Soluble vascular endothelial growth factor receptor 3	233	pg/mL
sc-kit/SCFR	Stem cell factor receptor	30.5	pg/mL
CA 125	Cancer Antigen 125	0.2	U/mL
CA 15-3	Cancer Antigen 15-3	0.03	U/mL
CA 19-9	Cancer Antigen 19-9	0.3	U/mL
CEA	Carcinoembryonic antigen	5.2	pg/mL
FGF2	Basic fibroblast growth factor	3.6	pg/mL
HE4	Human epididymis protein 4	193.5	pg/mL
HGF	Hepatocyte growth factor	6.8	pg/mL
IL-6	Interleukin 6	0.2	pg/mL
IL-8	Interleukin 8	0.3	pg/mL
Leptin	Leptin	42.8	pg/mL
MIF	Macrophage migration inhbitory factor	7.6	pg/mL
OPN	Osteopontin	285.3	pg/mL
Prolactin	Prolactin	30.2	pg/mL
SCF	Stem cell factor	2	pg/mL
TNFa	Tumor necrosis factor alpha	0.3	pg/mL
TRAIL	TNF-related apoptosis-inducing ligand	0.5	pg/mL
Total PSA	Total PSA	2	pg/mL
VEGF	Vascular endothelial growth factor	6.4	pg/mL
b-HCG	b-human chorionic gonadotropin	0.029	mU/mL
sFAS	Soluble tumor necrosis factor receptor superfamily member 6	8.4	pg/mL
Cathepsin D	Cathepsin D	0.4	ng/mL
FAP alpha	Fibroblast activation protein alpha	0.05	ng/mL
Ferritin	Ferritin	0.04	ng/mL
Galectin-3	Galectin-3	0.005	ng/mL
IGFBP3	Insulin-like growth factor binding protein 3	0.2	ng/mL

MIA	Melanoma Inhibitory Activity	0.12	ng/mL
MPO	Myeloperoxidase	0.03	ng/mL
SHBG	Sex hormone-binding globulin	0.05	nM
TIMP1	Tissue inhibitor of metallopeptidase 1	0.0136	ng/mL
TIMP2	Tissue inhibitor of metallopeptidase 2	0.0374	ng/mL

[00251] *Spike EV Isolation Models for EV Biomarker Signal*

[00252] To further understand the presence of relevant protein biomarkers on the EVs, EVs purified from cell culture supernatants representing two different cell lines were employed as positive controls. The cell line H1975 (ATCC CRL-5908™) is known to express the CA19-9 marker while the cell line HeLa (ATCC CRM-CCL-2™) is known to express the CA 125 marker. Briefly, the H1975 EVs were spiked at three different dilution ratios (1:200, 1:400 and 1:800 from the original UC prep) into K2EDTA plasma, the EVs were isolated using the Verita™ platform and subsequently analyzed on the Luminex platform for the presence of the CA 19-9 biomarker (**FIGS. 28A-28B**). In another experiment, the H1975 EVs and the HeLa EVs were spiked into K2EDTA plasma and isolated using the Verita™ platform. The biomarker reading results confirm the positive detection of the respective expected signals with CA19-9 being elevated for the H1975 EVs and CA 125 being elevated for the HeLa EVs (**FIGS. 28A-28B**).

[00253] *EV/exo-protein biomarker test development*

[00254] Biomarker Selection

[00255] From an initial evaluation of 42 EV proteins, 34 different biomarkers with less than 50% of samples missing or below the limit of detection (LOD) were considered (**Table 12**). In cases with missing values or results below the LOD, values were set (imputed) to the LOD. Distributions for all biomarkers were evaluated and distributions were found to be wide; thus, a Log2 transformation was used on all EV protein biomarker values in subsequent analyses. The correlations among the biomarkers was explored using the R module 'Corrplot' to determine the potential for multicollinearity in building classification models (correlation heatmap from all the biomarkers measures are shown in **FIGS. 29A-29B**). Subsequently, recursive feature elimination with cross-validation was employed to determine the most informative biomarkers. In this methodology, 4 of the 5 folds are used for selecting a subset of biomarkers using stepwise backwards selection. This process was repeated 5 times, using each fold once as a held-out test set. As the folds of cross-validation were chosen at random, this was repeated 100 times and the subset of biomarkers that maximized the partial AUC (pAUC) over the range of specificities from 75% to 100% across all test sets was selected.

[00256] Coefficient Determination and Performance Evaluation

[00257] Once the biomarkers were selected, an initial partition of the data into training (67%) and test (33%) sets, stratified by cancer types, allowed determination of the performance of the biomarkers selected by estimating the regression coefficients for the model using the training set and evaluating the classification performance in the hold-out test set (**FIG. 19**). To pursue a fair assessment of the model, given our relatively small sample size and to avoid overfitting, 100 independent training and test sets (made up of 2/3 and 1/3 of the 323 individuals stratified by cancer type) were resampled from the overall data set. The subjects in the training set, for each resample, were used to estimate biomarker regression coefficients in the model whereas the diagnostic performance was assessed independently in subjects in the hold-out test set. Receiver-Operator Characteristic (ROC) Curves, Area Under the Curve (AUC), sensitivity, specificity and related metrics were computed for the test sets based on the individual fits for each of the subjects in each respective partition. For each of the test sets, a threshold determination of > 99% specificity was computed (because there were 61 control subjects in each test set, this effectively means calling 61 out of 61 correctly) and subsequently the average threshold was computed. Using the average threshold and the average fit in the test set for each subject, the performance was evaluated for the overall cohort as well as for subcohorts (e.g., pancreatic cancer). The 95% confidence intervals for AUC were calculated using a bias-corrected bootstrapping method (N = 2000) while the confidence intervals for performance metrics, i.e. sensitivity and specificity, were calculated based on the Wilson two-sided method. During the evaluation of the logistic regression model, the importance of each biomarker selected was assessed using the average standardized coefficients (**Table 9**). Here "importance" can be understood as a quantitative comparison between predictors. One predictor is more important than another if it contributes more to the prediction of the response variable across all the models considered in the regression.

[00258] While preferred embodiments of the present invention have been shown and described herein, it will be obvious to those skilled in the art that such embodiments are provided by way of example only. Numerous variations, changes, and substitutions will now occur to those skilled in the art without departing from the invention. It should be understood that various alternatives to the embodiments of the invention described herein may be employed in practicing the invention. It is intended that the following claims define the scope of the invention and that methods and structures within the scope of these claims and their equivalents be covered thereby.

CLAIMS

WHAT IS CLAIMED IS:

1. A method for identifying a biomarker as associated with a disease state, the method comprising:
(a) isolating a first plurality of analytes in a first biological sample of an individual known to have the disease state using an electrode array configured to generate an AC dielectrophoretic field;
(b) isolating a second plurality of analytes in a second biological sample of healthy individual using an electrode array configured to generate an AC dielectrophoretic field; and
(c) identifying a subset of the first plurality of analytes, wherein the subset is quantitatively different in the first biological sample compared with the second biological sample,
wherein the subset is identified as associated with the disease state.

2. The method of claim 1, wherein isolating comprises using electrodes configured to generate a dielectrophoretic low field region and a dielectrophoretic high field region.

3. The method of claim 1, wherein isolating comprises capturing the first plurality of analytes or the second plurality of analytes on one or more electrode.

4. The method of claim 1, wherein identifying the subset comprises mass spectrometry analysis of the first plurality of analytes and the second plurality of analytes.

5. The method of claim 1, wherein identifying the subset comprises quantifying each of the first plurality of analytes and the second plurality of analytes.

6. The method of claim 1, wherein the analyte comprises a protein or a polypeptide.

7. The method of claim 1, wherein the analyte comprises a nucleic acid.

8. The method of claim 1, wherein the analyte comprises an exosome.

9. The method of claim 1, wherein (c) comprises subjecting the first plurality of analytes and the second plurality of analytes to mass spectroscopy.

10. The method of claim 1, wherein the disease state is a cancer, a neurological disease, an infection, or an inflammatory disease.

11. The method of claim 9, wherein the cancer is a pancreatic cancer, an ovarian cancer, a bladder cancer, a colorectal cancer, a lung cancer, a brain cancer, a prostate cancer, a breast cancer,

a skin cancer, a lymphoma, a tongue cancer, a mouth cancer, a pharynx cancer, an oral cavity cancer, an esophagus cancer, a stomach cancer, a small intestine cancer, a colon cancer, a rectum cancer, an anal cancer, an anorectum cancer, a liver cancer, an intrahepatic bile duct cancer, a gallbladder cancer, a biliary cancer, a digestive organ cancer, a larynx cancer, a bronchus cancer, a respiratory organ cancer, a bone cancer, a joint cancer, a soft tissue cancer, a heart cancer, a melanoma, a nonepithelial skin cancer, a uterine cancer, a cervical cancer, a vulva cancer, a vagina cancer, a penis cancer, a genital cancer, a testis cancer, a kidney cancer, a renal pelvis cancer, a ureter cancer, a urinary organ cancer, an eye cancer, an orbit cancer, a nervous system cancer, an endocrine cancer, a thyroid cancer, a Hodgkin lymphoma, a non-Hodgkin lymphoma, a myeloma, an acute lymphocytic leukemia, a chronic lymphocytic leukemia, an acute myeloid leukemia, a chronic myeloid leukemia, or a leukemia.

12. A method of analysis comprising:
(a) measuring an amount of an analyte in a biological sample from an individual; and
(b) identifying the individual as being at risk of developing a disease when the amount of the analyte is greater than or less than the amount observed in a control sample.

13. The method of claim 12, wherein the analyte comprises one or more biomarker identified in any of the method of claims 1 to 11.

14. The method of claim 12, wherein the analyte comprises one or more proteins provided in Table 5.

15. The method of any one of claims 12 to 14, wherein measuring comprises isolating the analytes in the biological sample using an electrode array configured to generate an AC dielectrophoretic field.

16. The method of claim 15, wherein isolating comprises using electrodes configured to generate a dielectrophoretic low field region and a dielectrophoretic high field region.

17. The method of claim 15, wherein isolating comprises capturing the first plurality of analytes or the second plurality of analytes on one or more electrode.

18. The method of any one of claims 12 to 14, wherein measuring comprises mass spectrometry analysis of the analyte.

19. The method of any one of claims 12 to 14, wherein the analyte comprises a protein or a polypeptide.

20. The method of any one of claims 12 to 14, wherein the analyte comprises a nucleic acid.

21. The method of any one of claims 12 to 14, wherein the analyte comprises an exosome.

22. The method of any one of claims 12 to 14, wherein the disease is a cancer, a neurological disease, an infection, or an inflammatory disease.

23. The method of claim 22, wherein the cancer is a pancreatic cancer, an ovarian cancer, a bladder cancer, a colorectal cancer, a lung cancer, a brain cancer, a prostate cancer, a breast cancer, a skin cancer, a lymphoma, a tongue cancer, a mouth cancer, a pharynx cancer, an oral cavity cancer, an esophagus cancer, a stomach cancer, a small intestine cancer, a colon cancer, a rectum cancer, an anal cancer, an anorectum cancer, a liver cancer, an intrahepatic bile duct cancer, a gallbladder cancer, a biliary cancer, a digestive organ cancer, a larynx cancer, a bronchus cancer, a respiratory organ cancer, a bone cancer, a joint cancer, a soft tissue cancer, a heart cancer, a melanoma, a nonepithelial skin cancer, a uterine cancer, a cervical cancer, a vulva cancer, a vagina cancer, a penis cancer, a genital cancer, a testis cancer, a kidney cancer, a renal pelvis cancer, a ureter cancer, a urinary organ cancer, an eye cancer, an orbit cancer, a nervous system cancer, an endocrine cancer, a thyroid cancer, a Hodgkin lymphoma, a non-Hodgkin lymphoma, a myeloma, an acute lymphocytic leukemia, a chronic lymphocytic leukemia, an acute myeloid leukemia, a chronic myeloid leukemia, or a leukemia.

24. A method of identifying a therapeutic target, the method comprising:
(a) isolating a first plurality of analytes in a first biological sample of an individual known to have the disease state using an electrode array configured to generate an AC dielectrophoretic field;
(b) isolating a second plurality of analytes in a second biological sample of healthy individual using an electrode configured to generate an AC dielectrophoretic field; and
(c) identifying a subset of the first plurality of analytes, wherein the subset is quantitatively different in the first biological sample compared with the second biological sample,
wherein the subset is identified as the therapeutic target.

25. The method of claim 24, wherein (c) comprises mass spectroscopy of the first and second plurality of analytes.

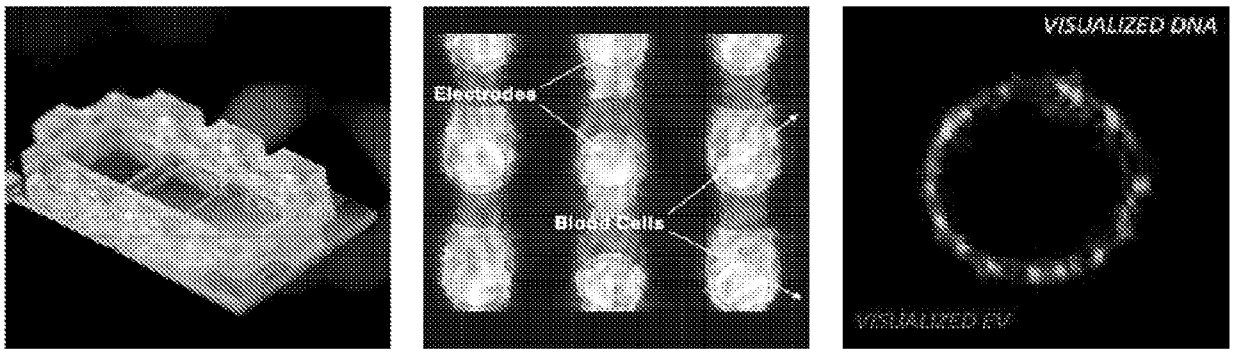


FIG. 1

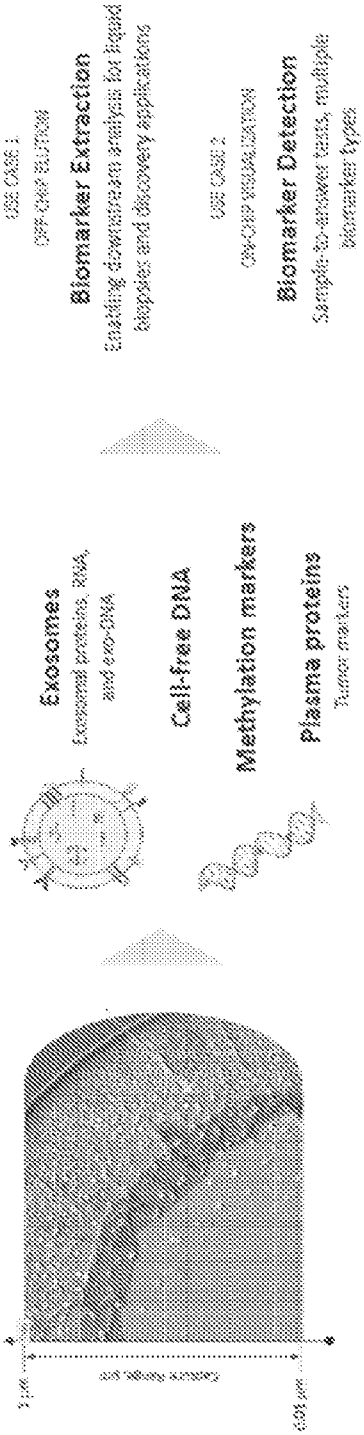
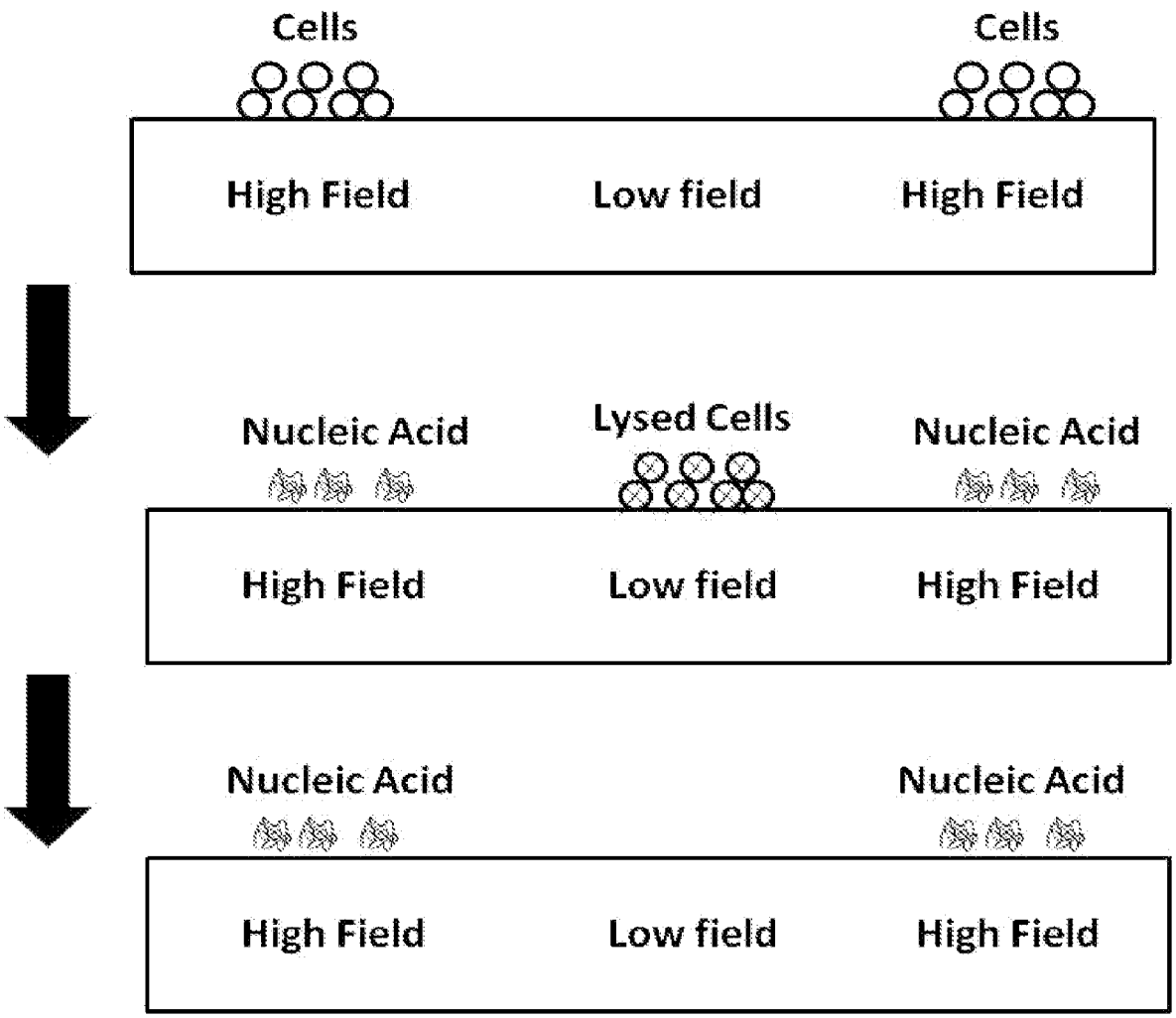

USE CASE 1
Off-chip elution
Biomarker Extraction
Enabling downstream analysis for liquid biopsies and discovery applications
USE CASE 2
On-chip visualization
Biomarker Detection
Sample-to-answer tests, multiple biomarker types
Exosomes
Exosomal proteins, RNA, and exo-DNA
Cell-free DNA
Methylation markers
Plasma proteins
Tumor markers

FIG. 2


Cells
Cells
High Field
Low field
High Field
Nucleic Acid
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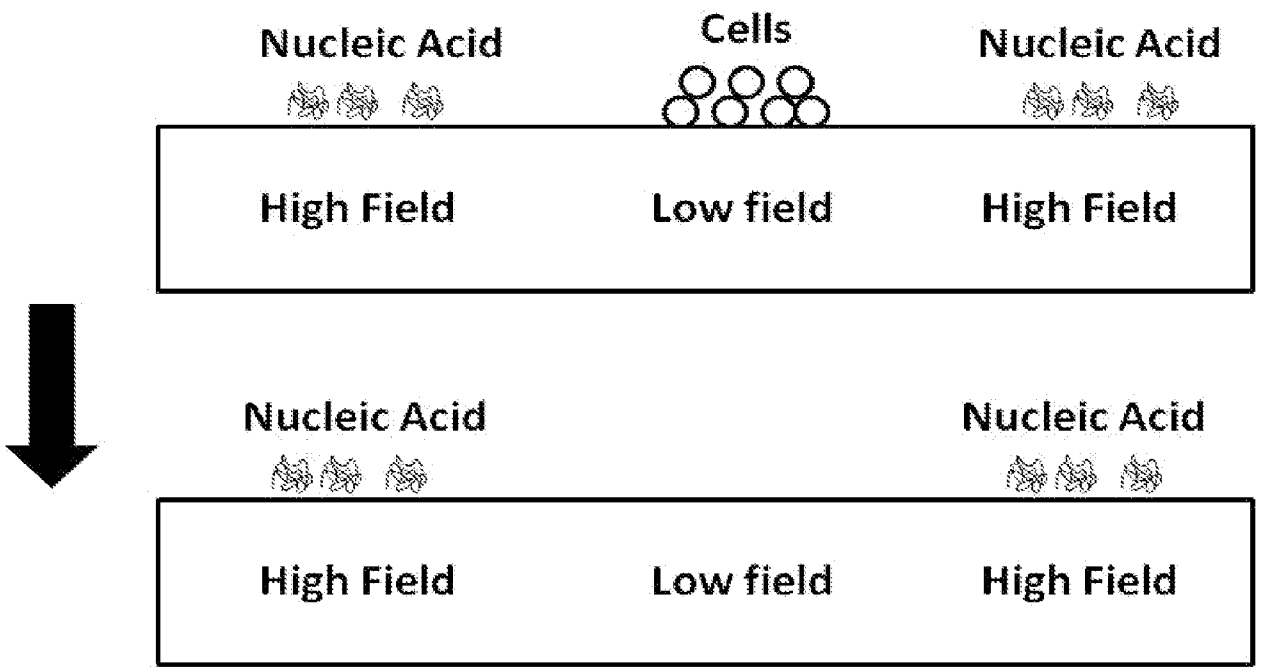
High Field
Low field
High Field

FIG. 3


Nucleic Acid
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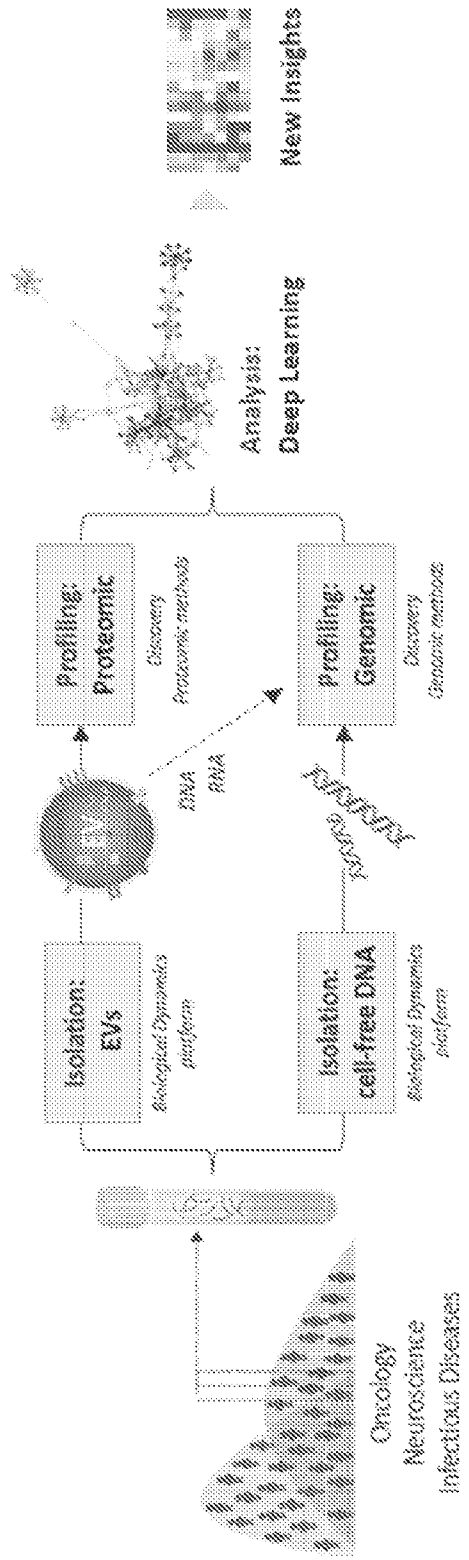
Nucleic Acid
High Field
Low field
High Field
Nucleic Acid
Nucleic Acid
High Field
Low field
High Field

FIG. 4


New Insights
Analysis:
Deep Learning
Profiling:
Proteomic
Discovery
Proteomic methods
Profiling:
Genomic
Discovery
Genomic methods
DNA
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Biological Dynamics
platform
Isolation:
cell-free DNA
Biological Dynamics
platform
Oncology
Neuroscience
Infectious Diseases

FIG. 5

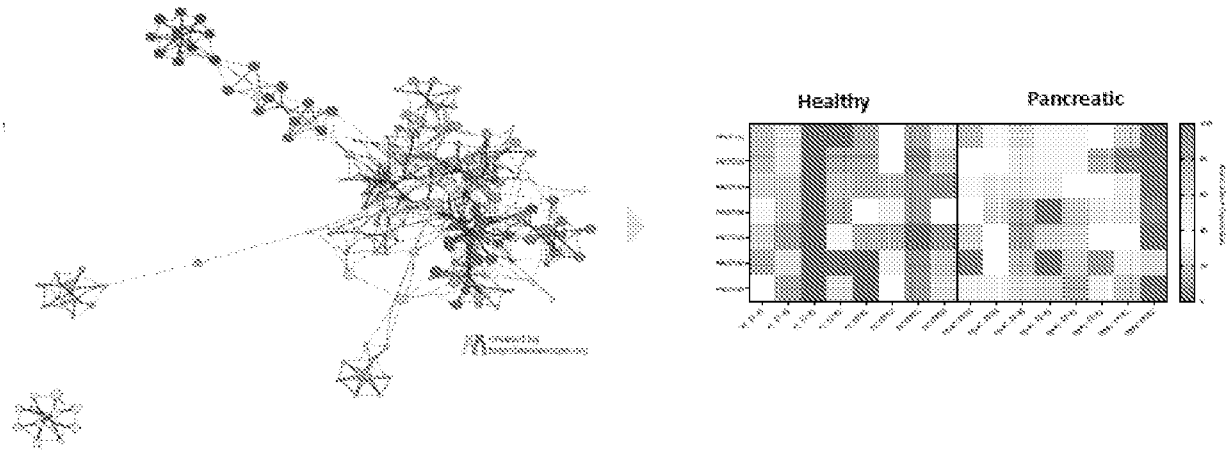
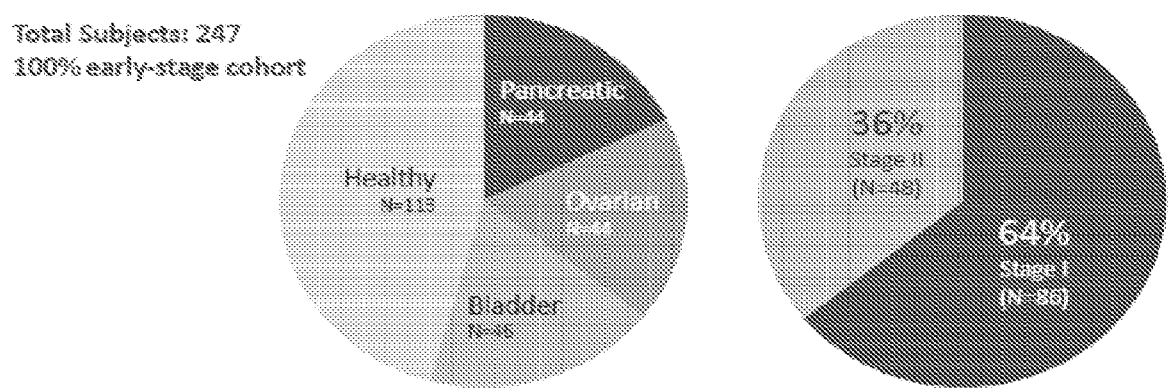
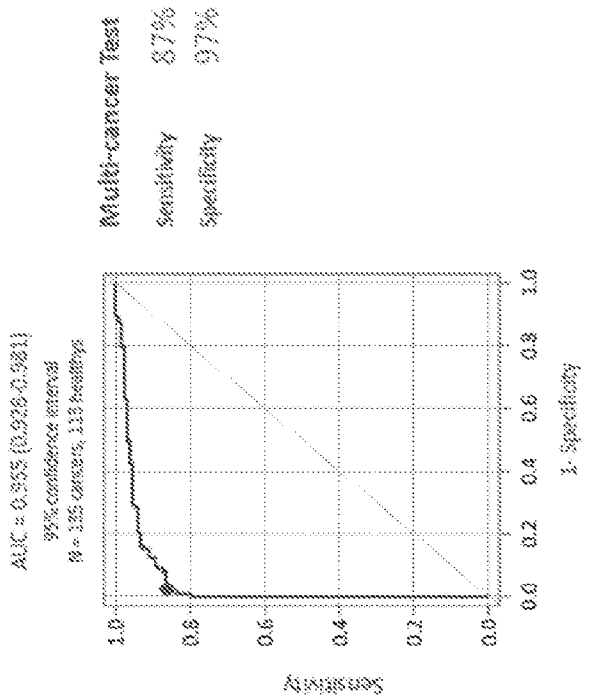


FIG. 6



	bladder	ovarian	pancreatic	controls
Subjects, N	46	44	44	113
Gender	6F/40M	44F/0M	32F/12M	64F/49M
Stage I	26	39	21	-
Stage II	20	5	23	-

FIG. 7



Preliminary data:

- 100% early-stage cohort (stages I + II)
- 3 cancer types
  (Ovarian, Pancreatic, and Bladder), retrospectively collected frozen plasma samples
- Biomarker class: exo-proteins

Sensitivity at 97% Specificity per cancer per stage

	Multi-Cancer	Bladder	Ovarian	Pancreatic
Overall	87%	76%	84%	100%
Stage I	85%	77%	92%	100%
Stage II	93%	75%	100%	100%

FIG. 8

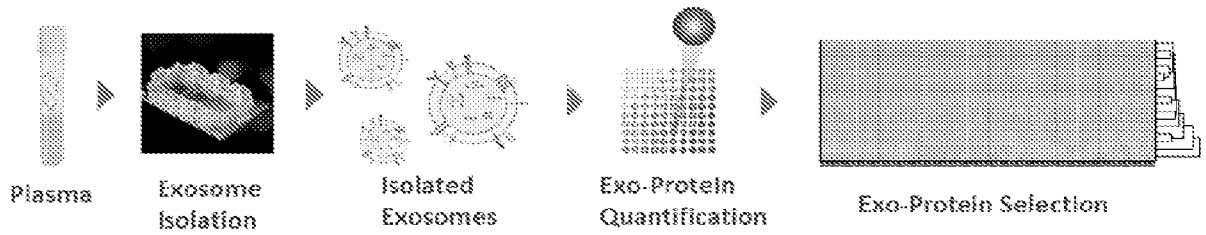


FIG. 9A

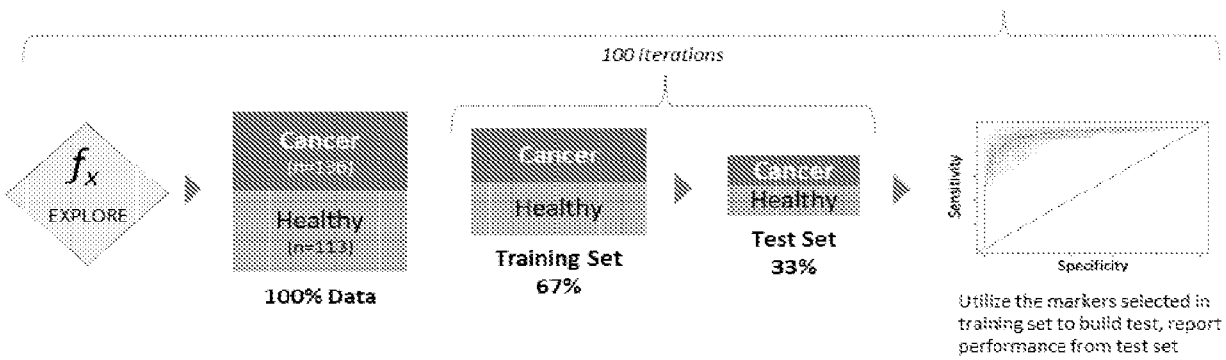


FIG. 9B

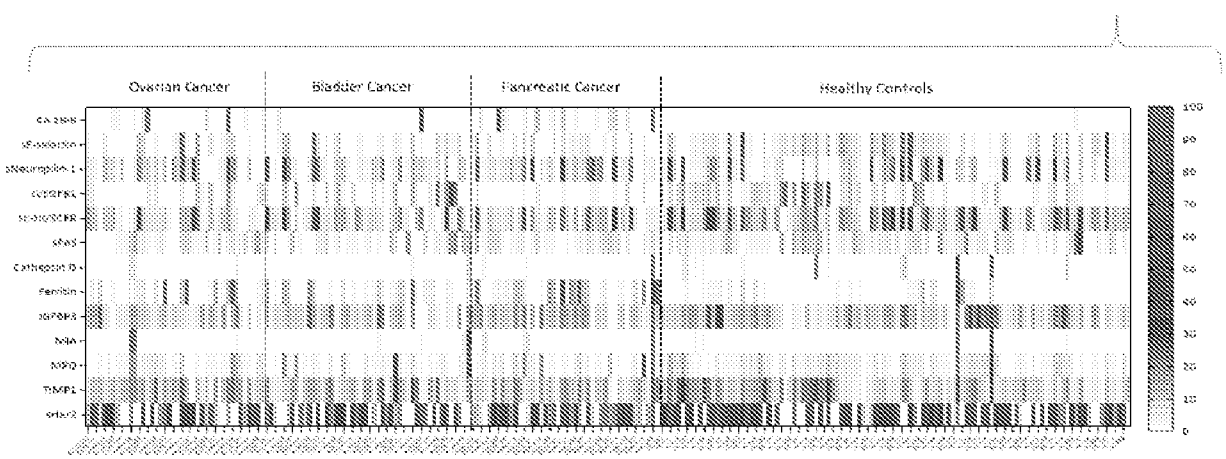


FIG. 9C

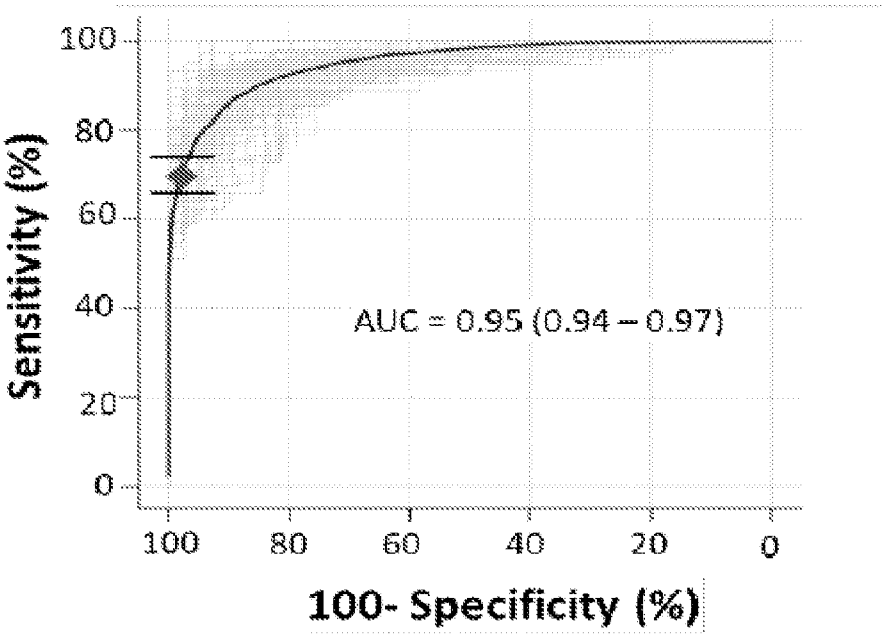


FIG. 10A

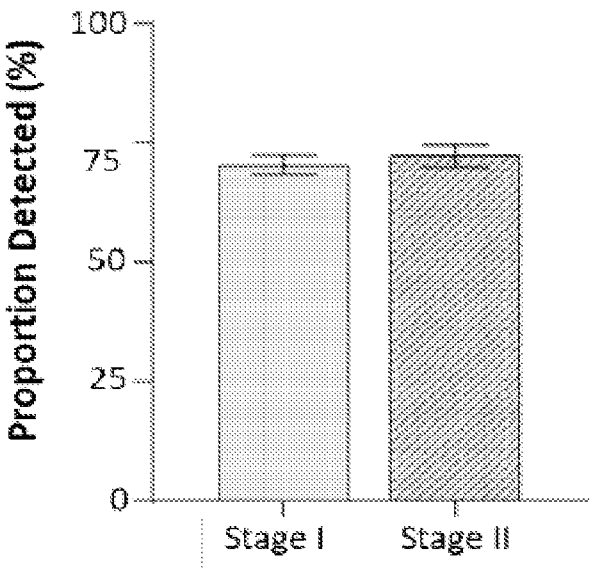


FIG. 10B

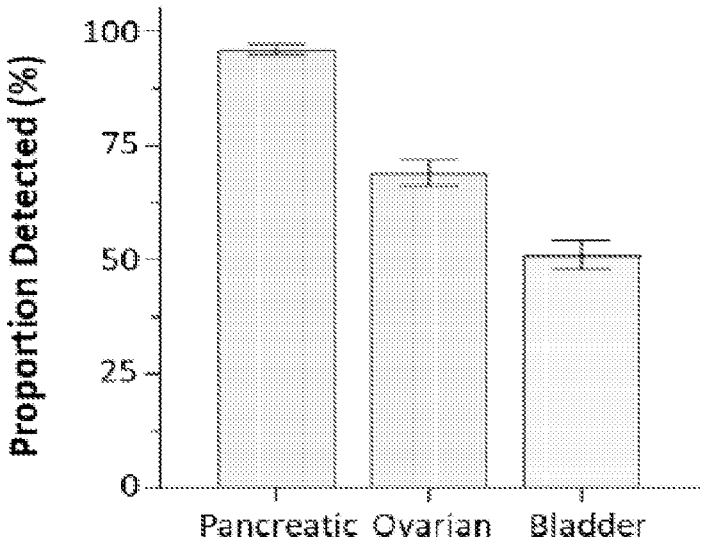


FIG. 10C

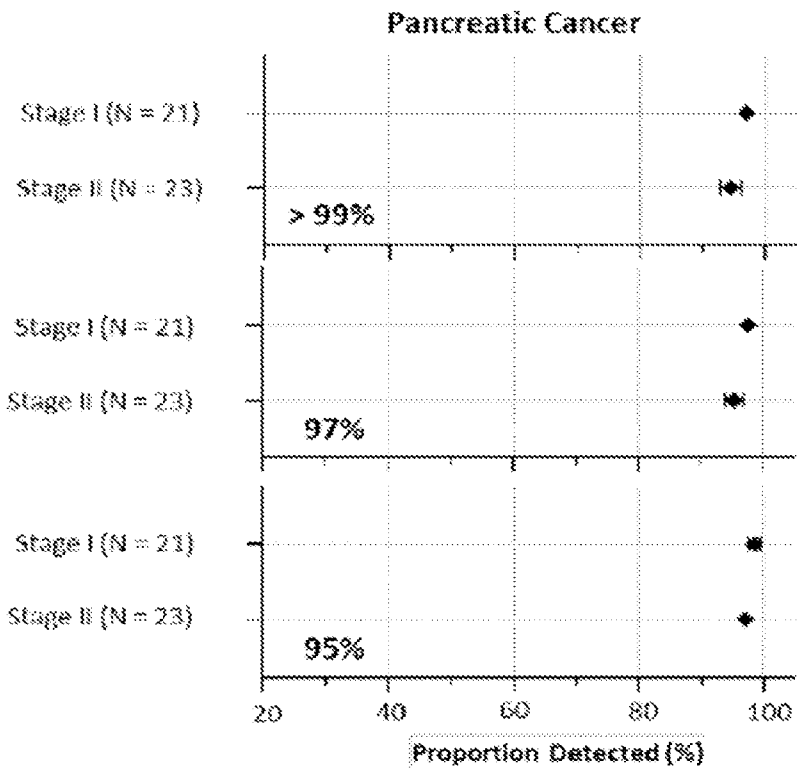


FIG. 11A

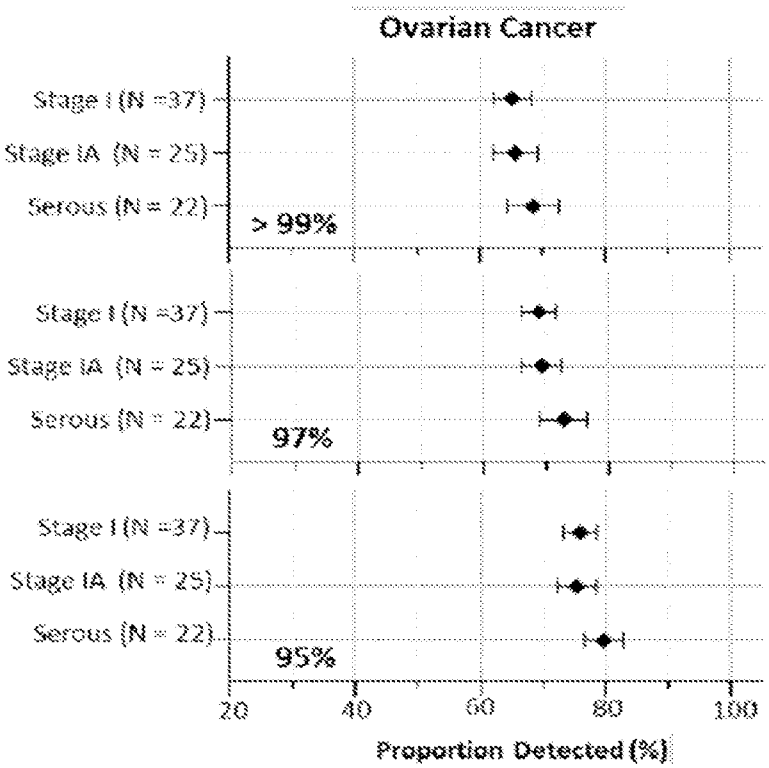

Ovarian Cancer
Stage I (N =37)
Stage IA (N = 25)
Serous (N = 22)
> 99%
Stage I (N =37)
Stage IA (N = 25)
Serous (N = 22)
97%
Stage I (N =37)
Stage IA (N = 25)
Serous (N = 22)
95%
20
40
60
80
100
Proportion Detected (%)

FIG. 11B

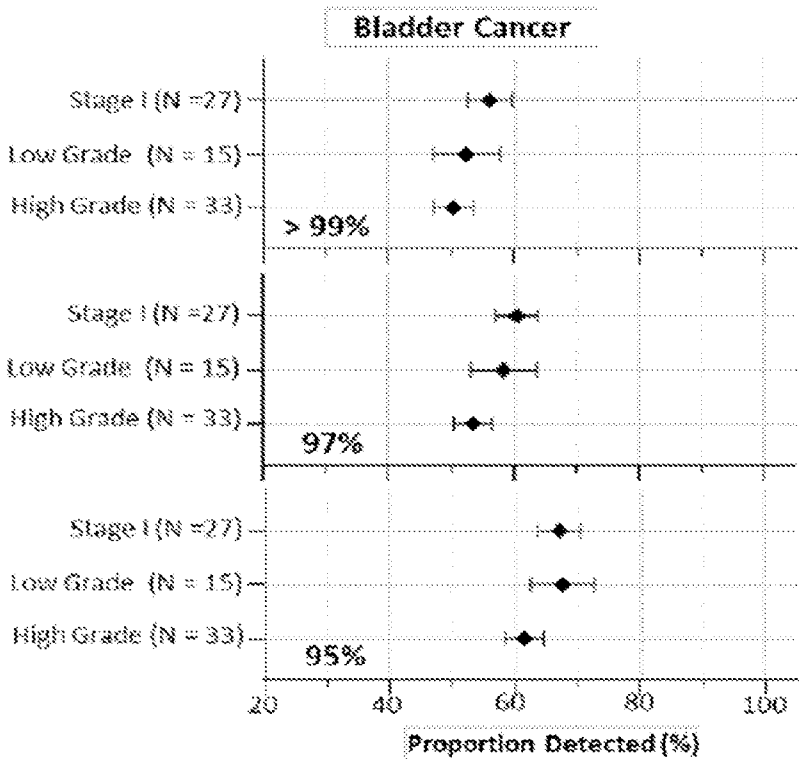


FIG. 11C

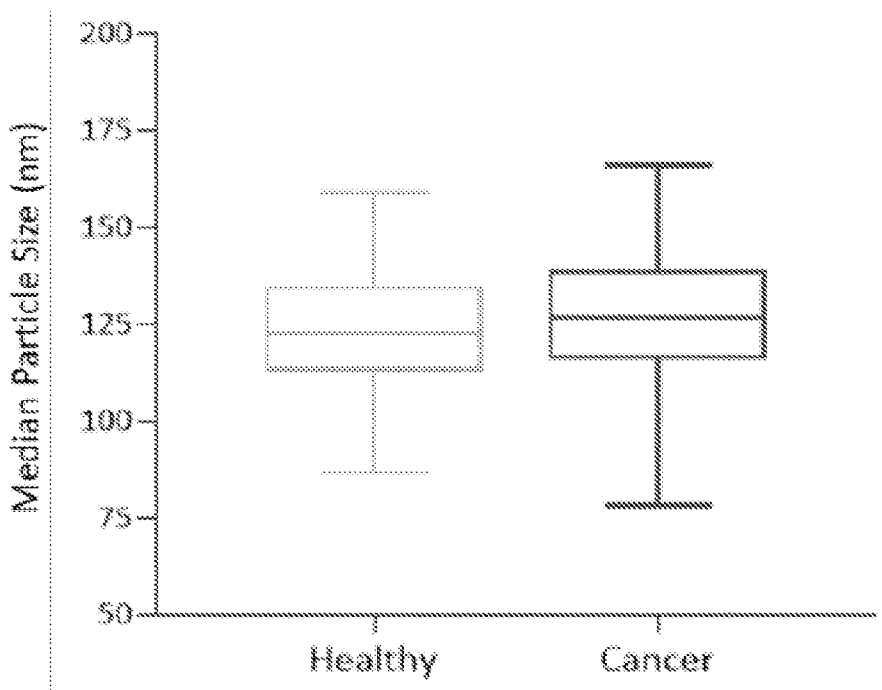


FIG. 12A

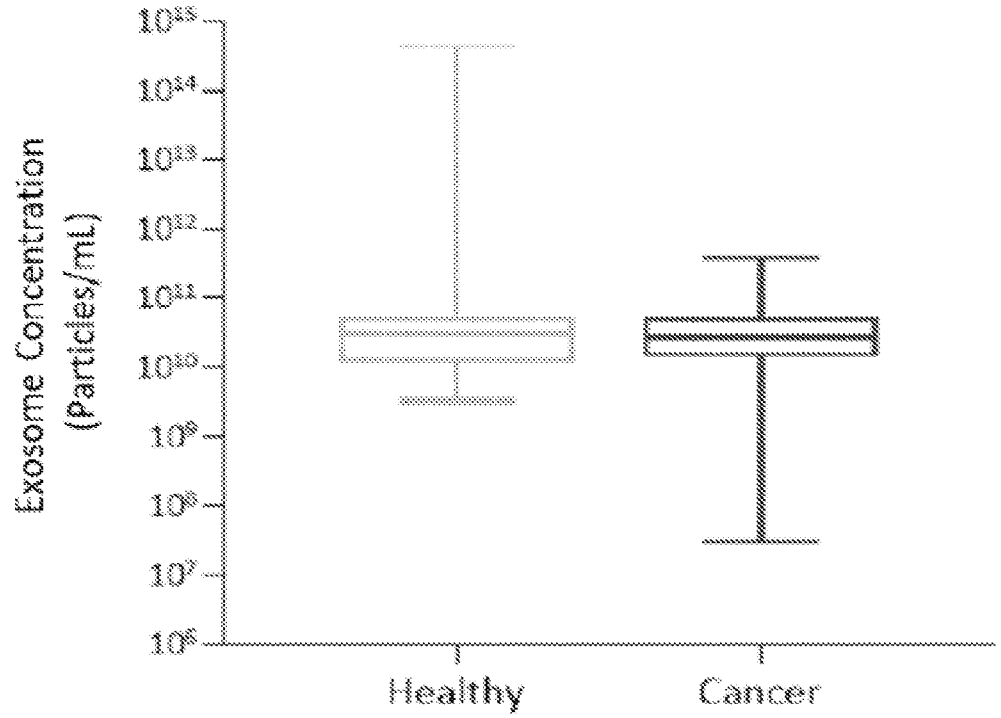


FIG. 12B

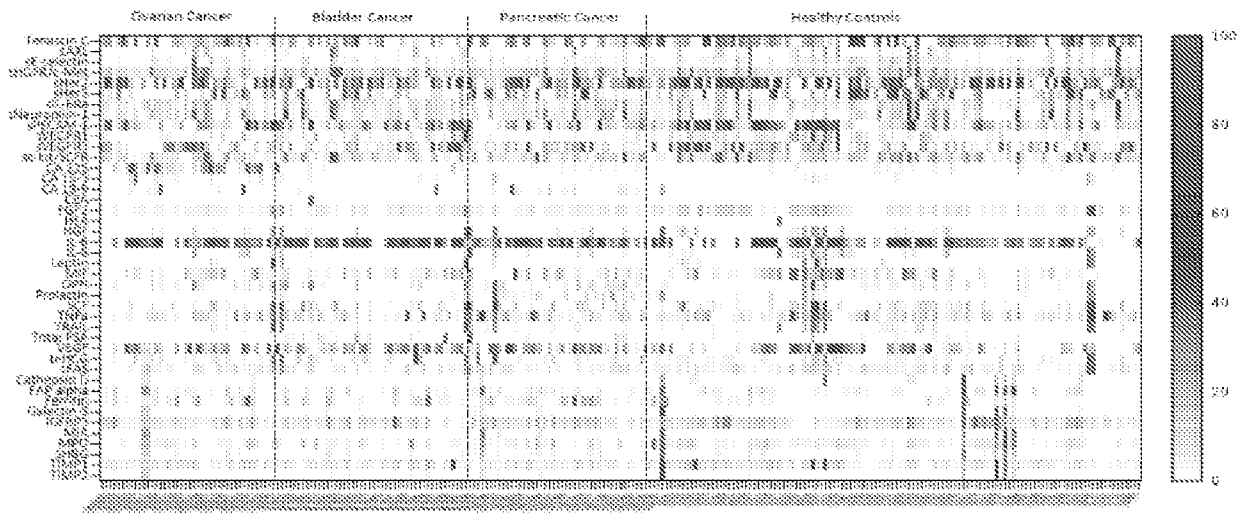


FIG. 13A

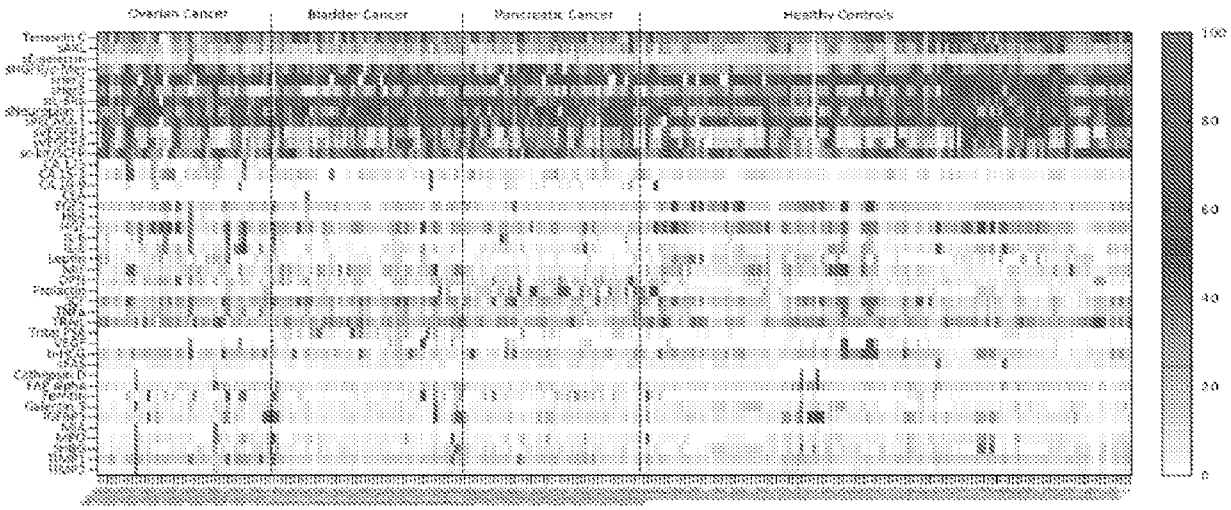

Ovarian Cancer
Bladder Cancer
Pancreatic Cancer
Healthy Controls
100
80
60
40
20
0

FIG. 13B

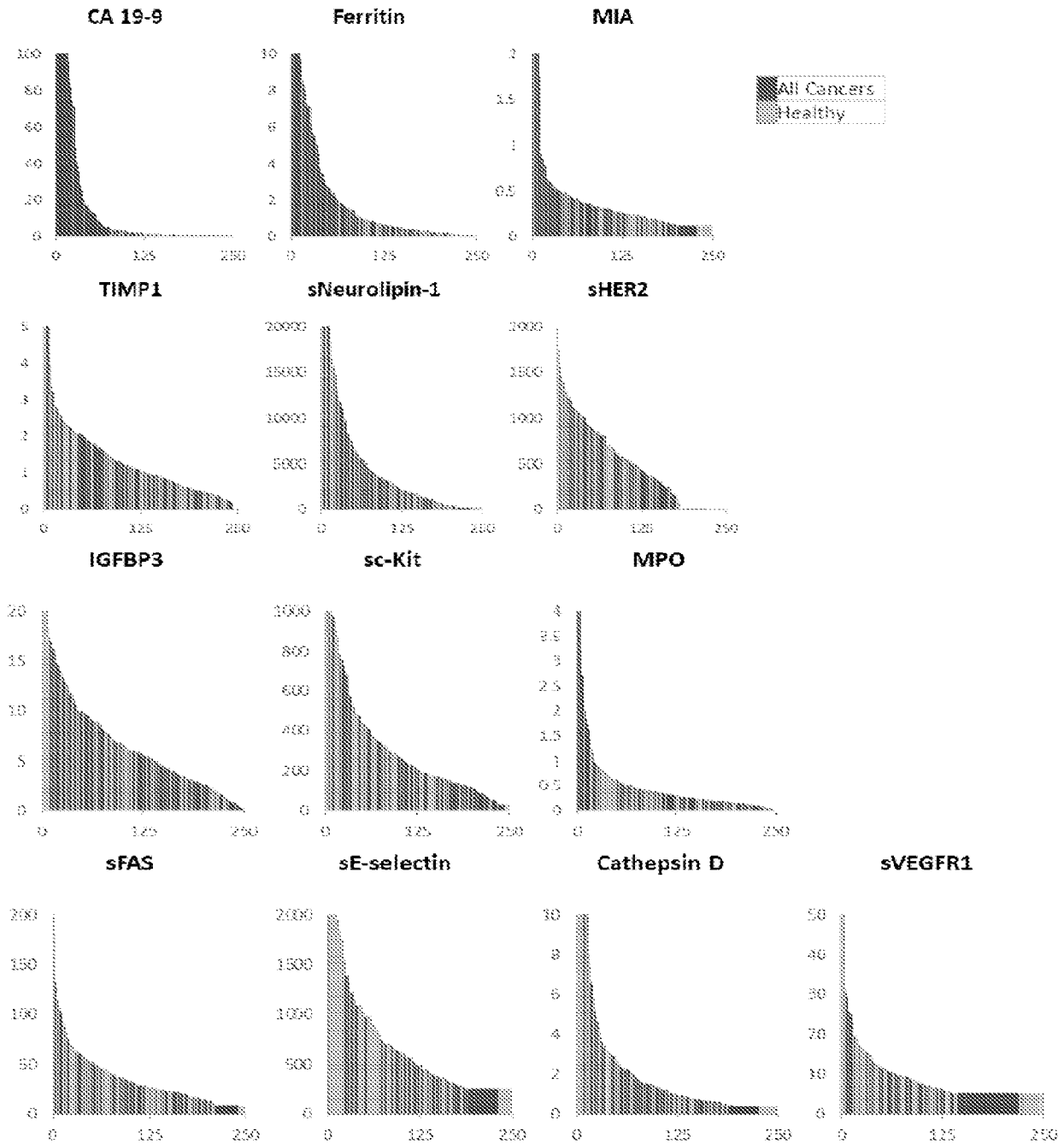

CA 19-9
Ferritin
MIA
All Cancers
Healthy
TIMP1
sNeurolipin-1
sHER2
IGFBP3
sc-Kit
MPO
sFAS
sE-selectin
Cathepsin D
sVEGFR1

FIG. 14

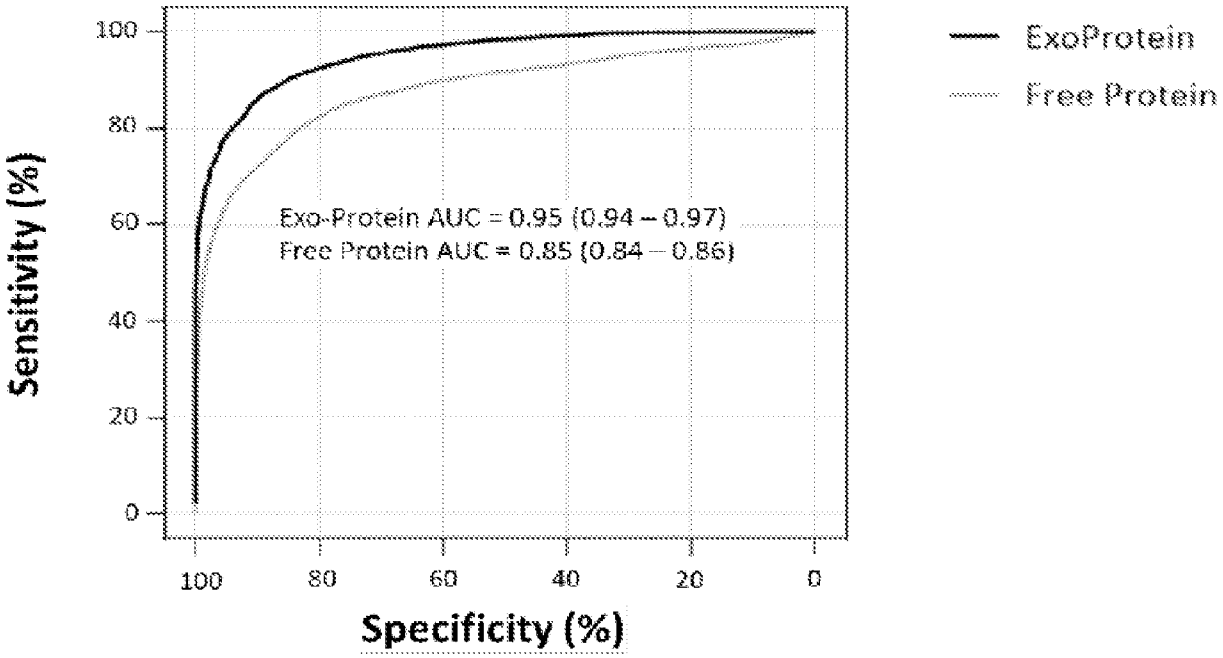


FIG. 15

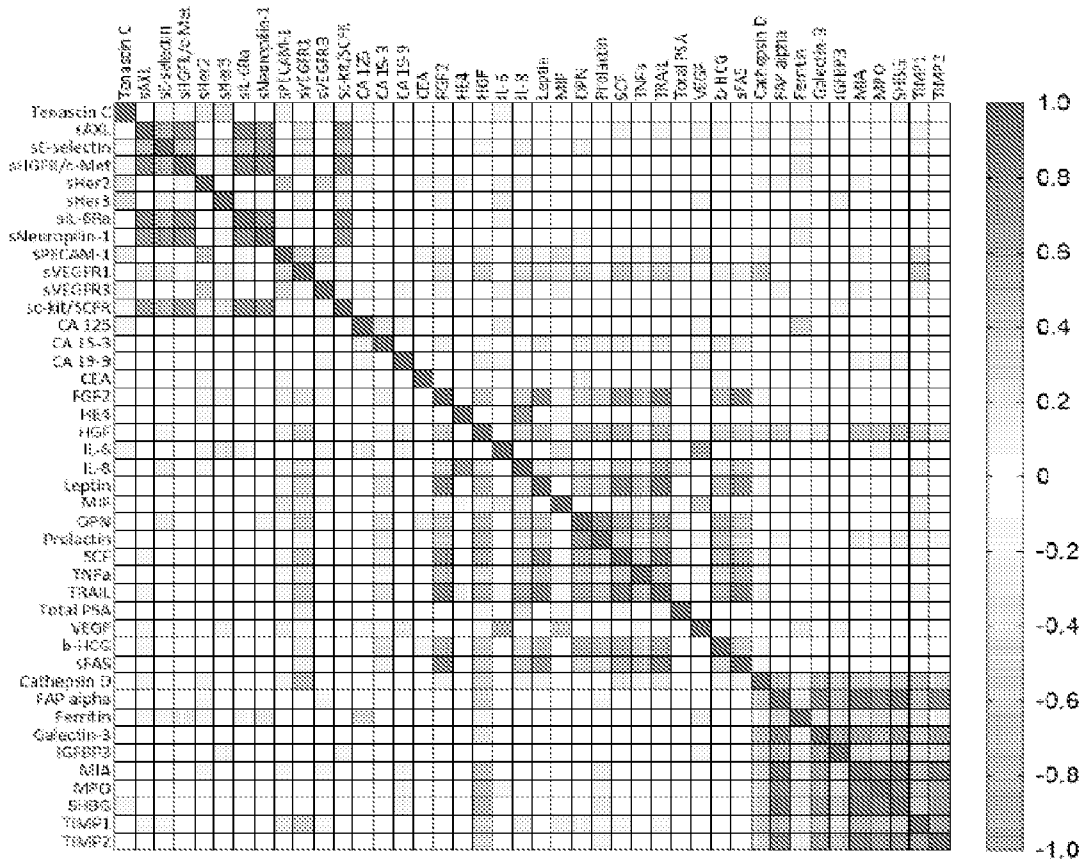


FIG. 16A

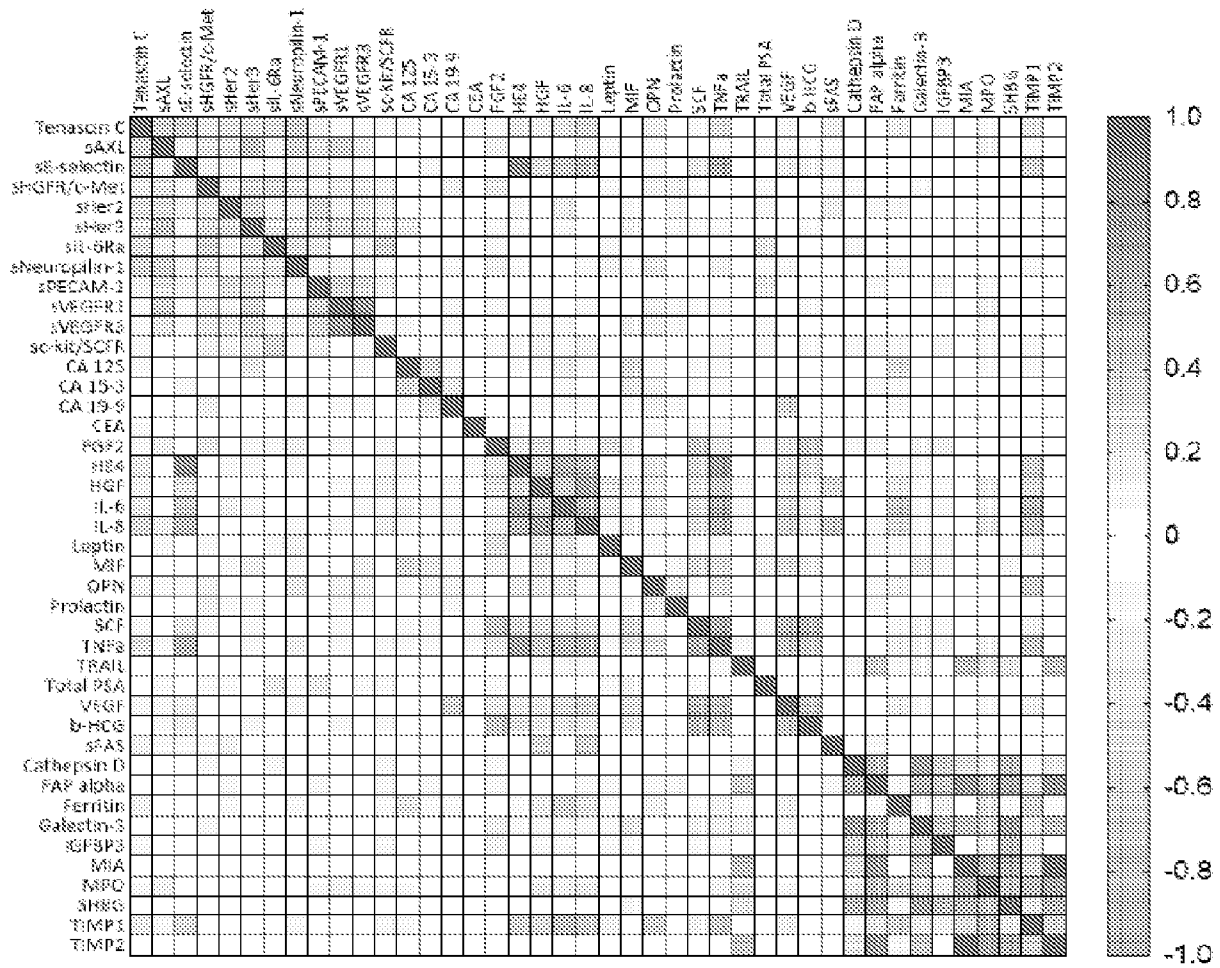

Tenascin C
sAXL
sE-selectin
sHGFR/c-Met
sHer2
sHer3
sIL-6Ra
sNeuropilin-1
sPECAM-1
sVEGFR1
sVEGFR3
sc-kit/SCFR
CA 125
CA 15-3
CA 19-9
CEA
FGF2
HE4
HGF
IL-6
IL-8
Leptin
MIF
OPN
Prolactin
SCF
TNFa
TRAIL
Total PSA
VEGF
b-HCG
sFAS
Cathepsin D
PAP alpha
Ferritin
Galectin-3
IGFBP3
MIA
MPO
SHBG
TIMP1
TIMP2
1.0
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1.0

FIG. 16B

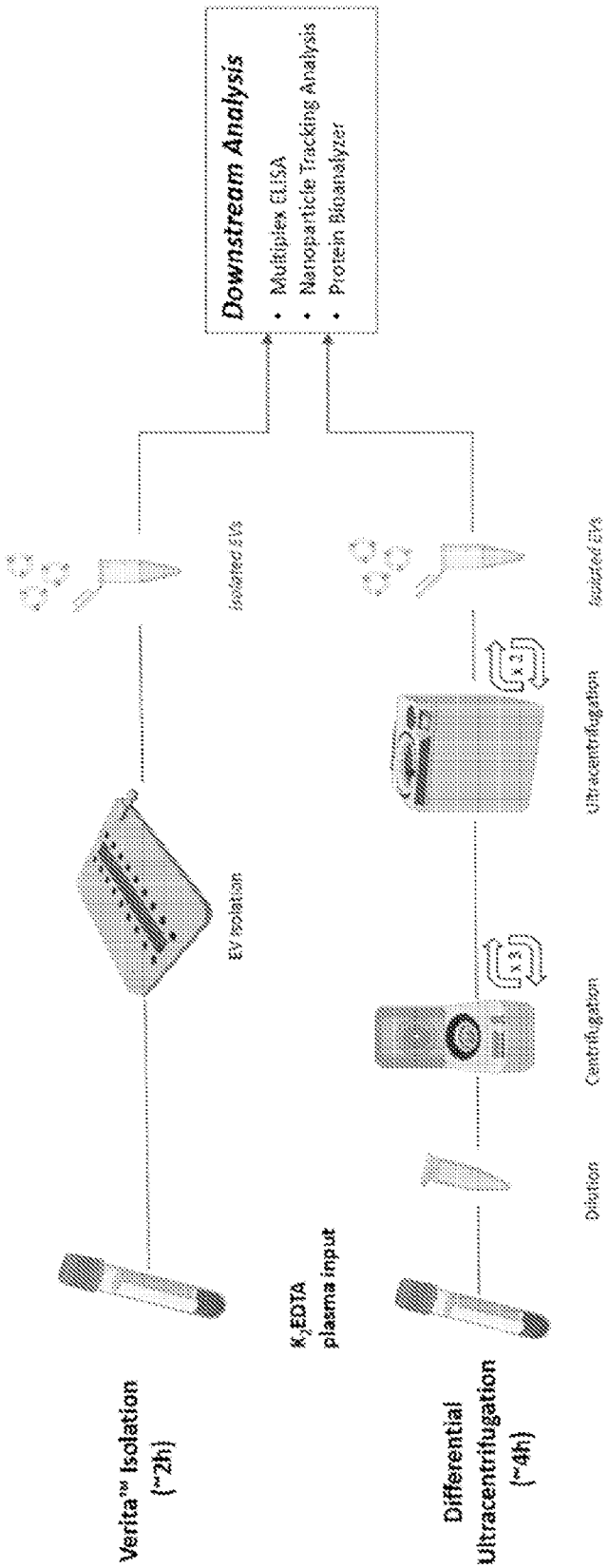

Downstream Analysis
• Multiplex ELISA
• Nanoparticle Tracking Analysis
• Protein Bioanalyzer
Isolated EVs
EV Isolation
Dilution
Centrifugation
Ultracentrifugation
Isolated EVs
x 3
x 3
K2EDTA
plasma input
Verita™ Isolation
(~2h)
Differential
Ultracentrifugation
(~4h)

FIG. 17

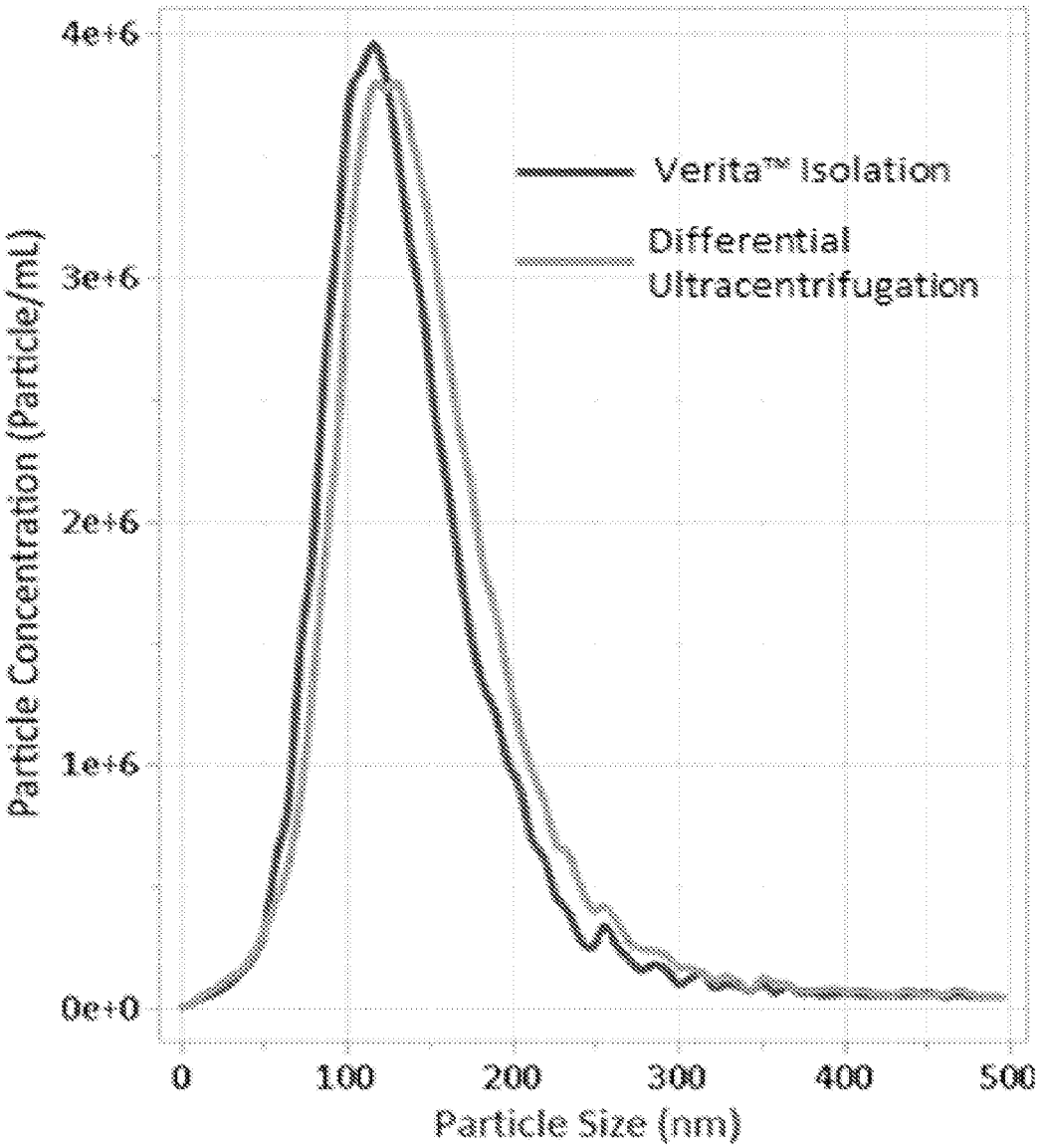

4e+6
3e+6
2e+6
1e+6
0e+0
Particle Concentration (Particle/mL)
0
100
200
300
400
500
Particle Size (nm)
Verita™ Isolation
Differential Ultracentrifugation

FIG. 18A

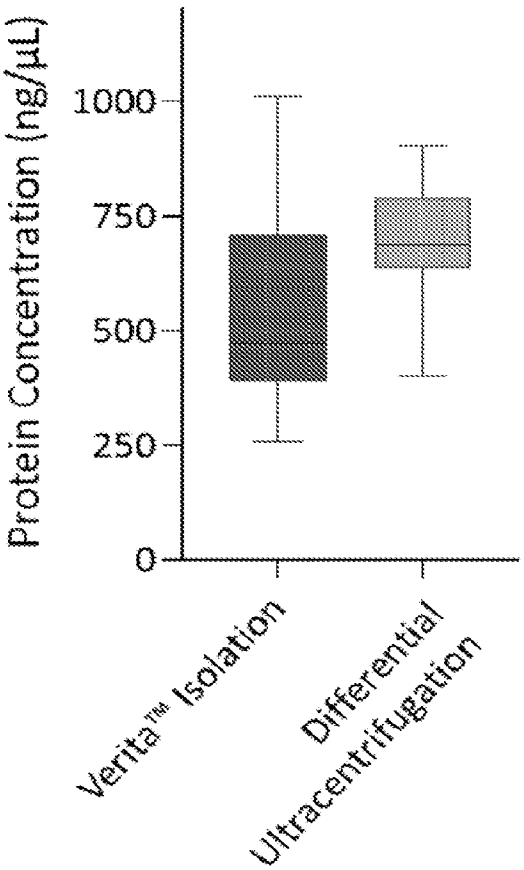

Protein Concentration (ng/µL)
1000
750
500
250
0
Verita™ Isolation
Differential Ultracentrifugation

FIG. 18B

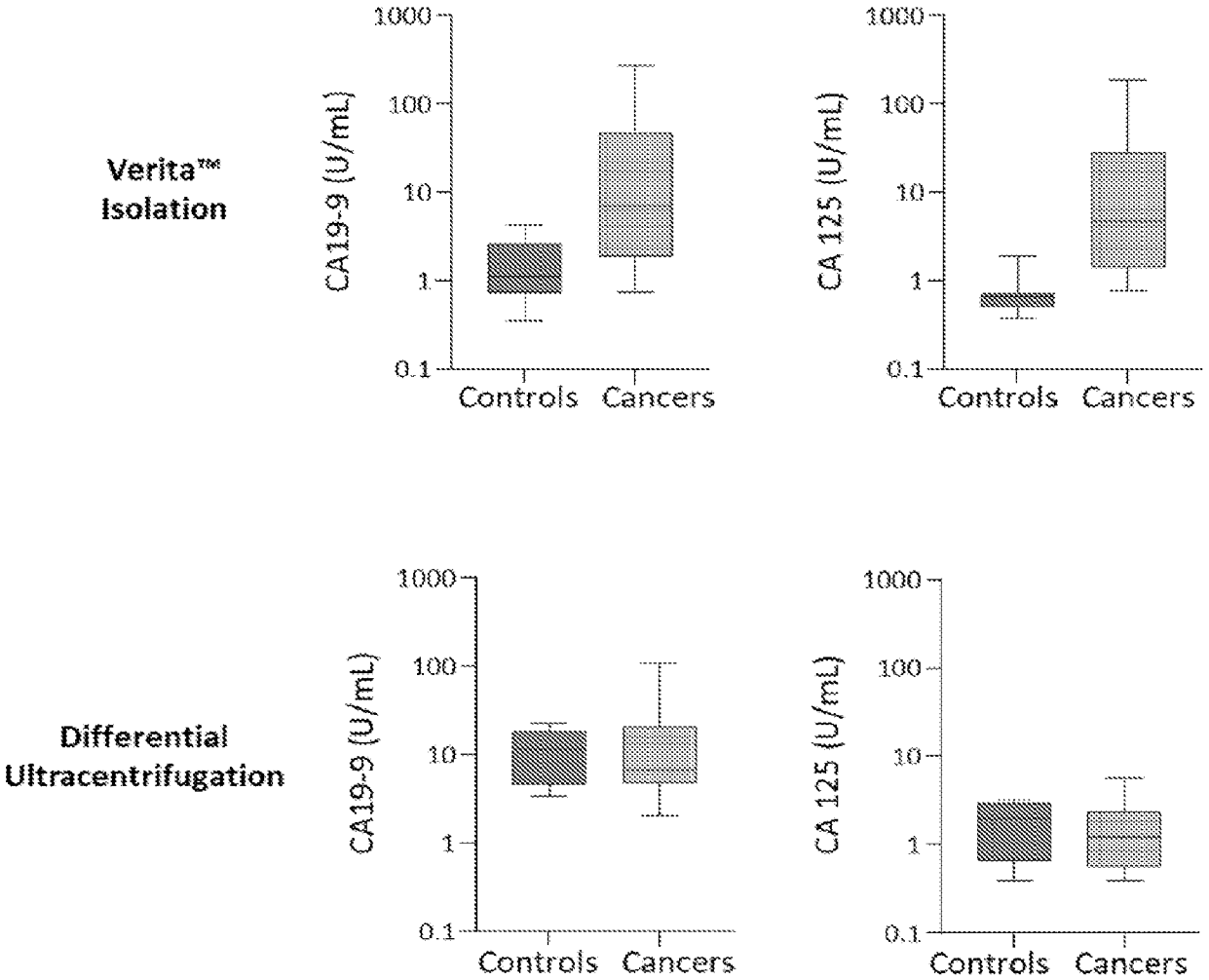

Verita™ Isolation
CA19-9 (U/mL)
1000
100
10
1
0.1
Controls
Cancers
CA 125 (U/mL)
1000
100
10
1
0.1
Controls
Cancers
Differential Ultracentrifugation
CA19-9 (U/mL)
1000
100
10
1
0.1
Controls
Cancers
CA 125 (U/mL)
1000
100
10
1
0.1
Controls
Cancers

FIG. 18C

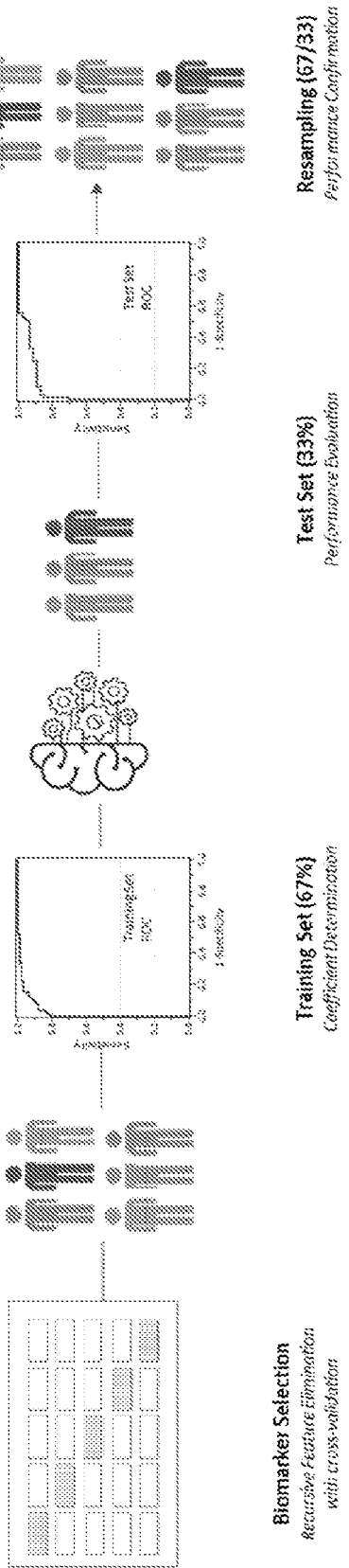

Biomarker Selection
Recursive Feature Elimination with cross-validation
Training Set (67%)
Coefficient Determination
Test Set (33%)
Performance Evaluation
Resampling (67/33)
Performance Confirmation

FIG. 19

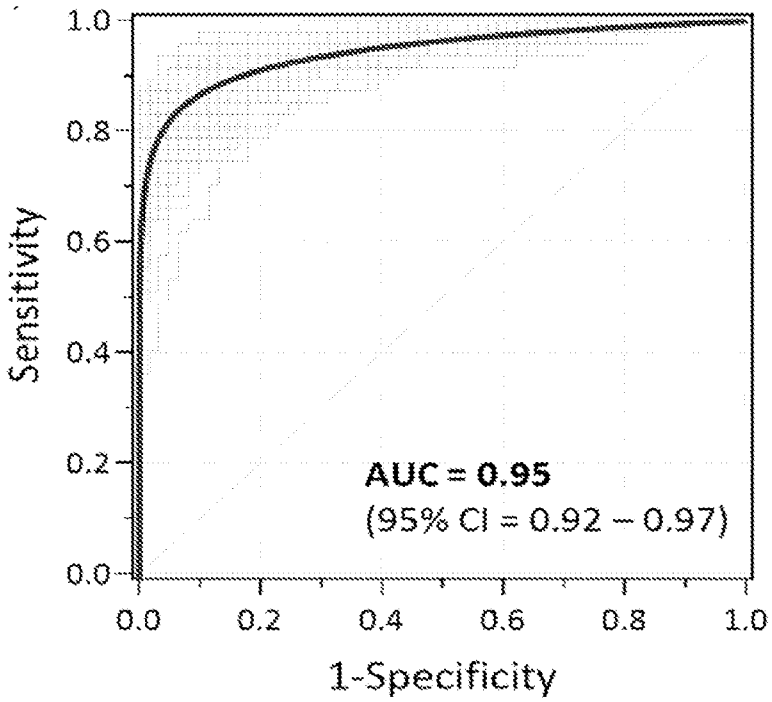


FIG. 20A

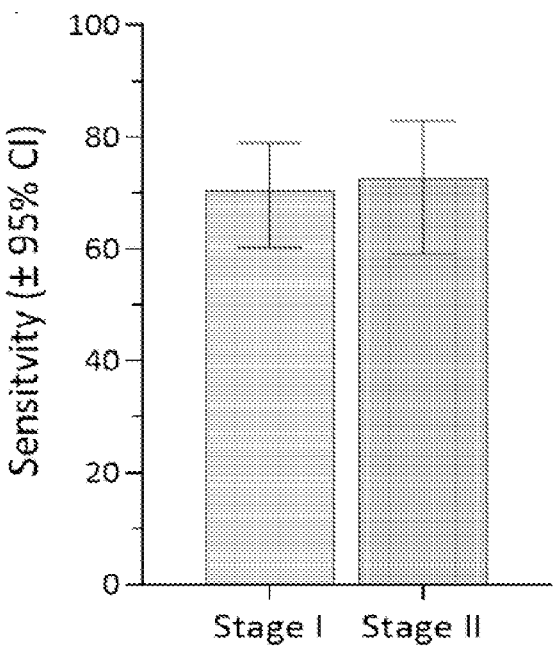


FIG. 20B

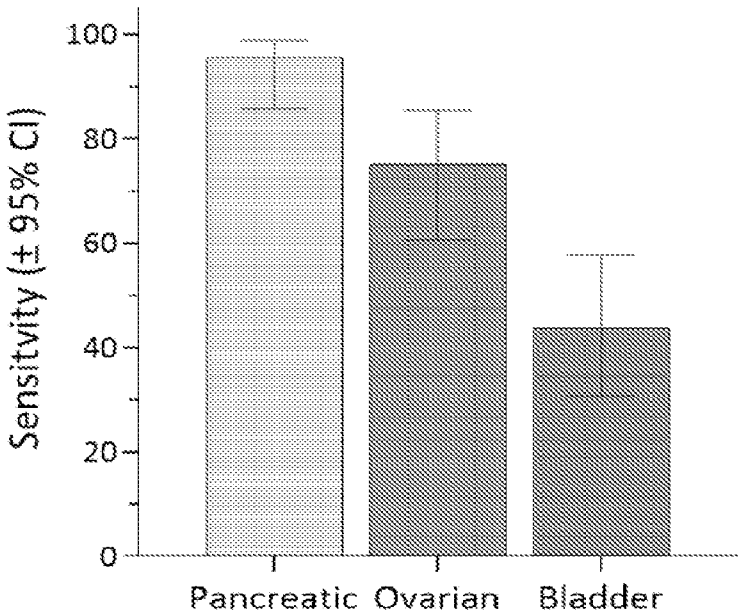


FIG. 20C

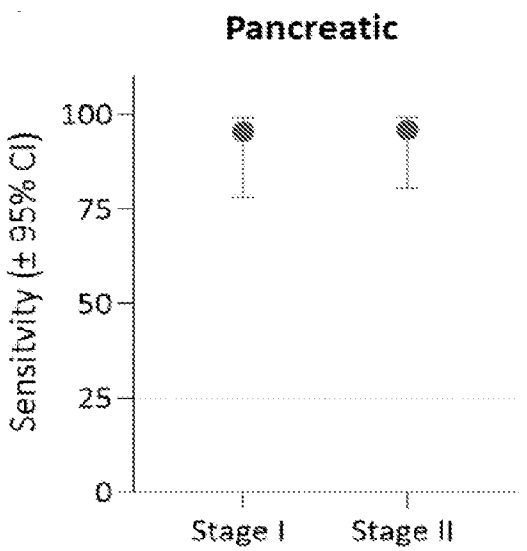


FIG. 21A

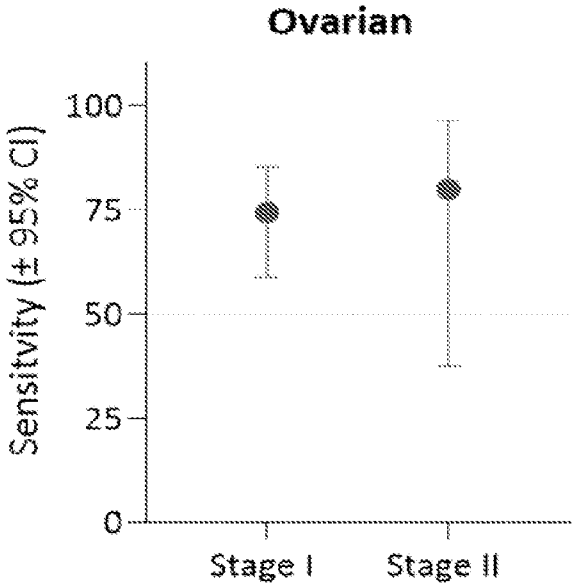


FIG. 21B

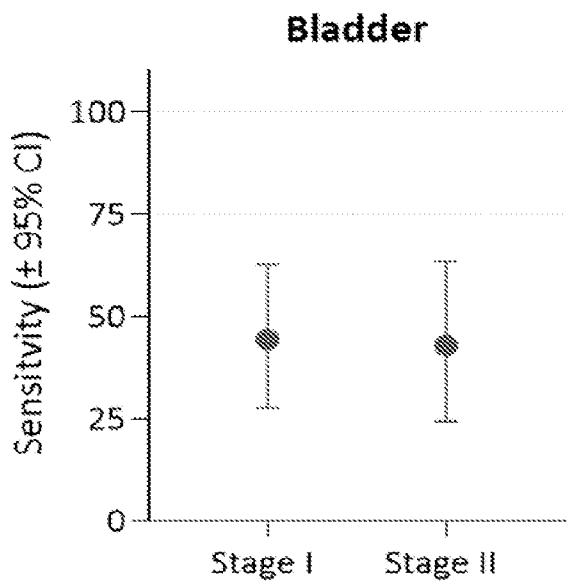


FIG. 21C

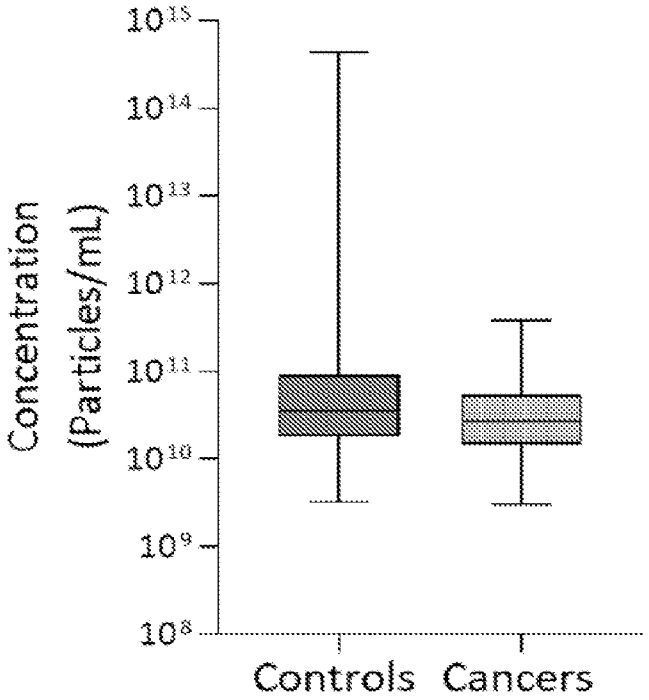


FIG. 22A

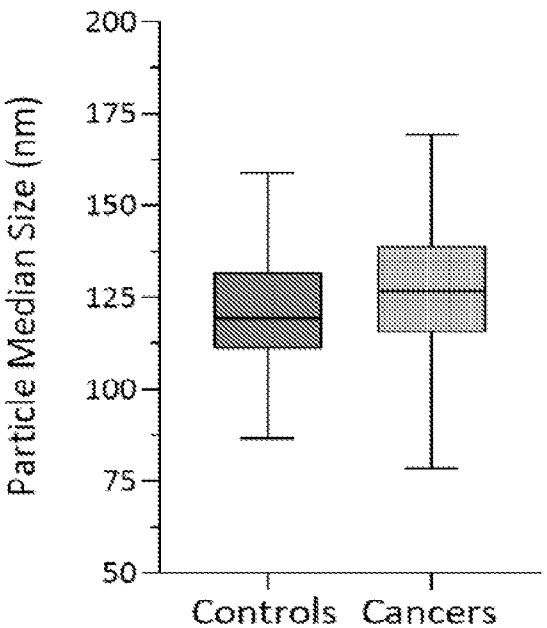


FIG. 22B

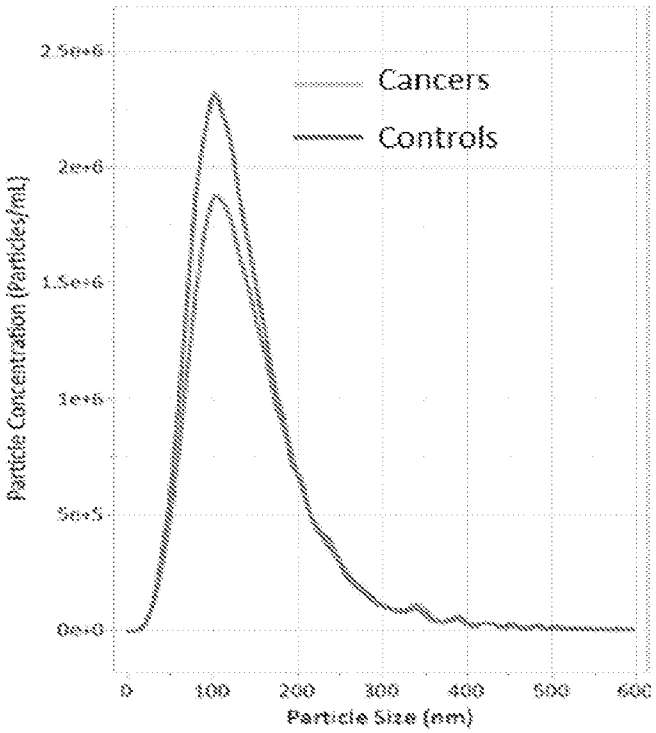

Cancers
Controls
Particle Concentration (Particles/mL)
2.5e+6
2e+6
1.5e+6
1e+6
5e+5
0e+0
0
100
200
300
400
500
600
Particle Size (nm)

FIG. 22C

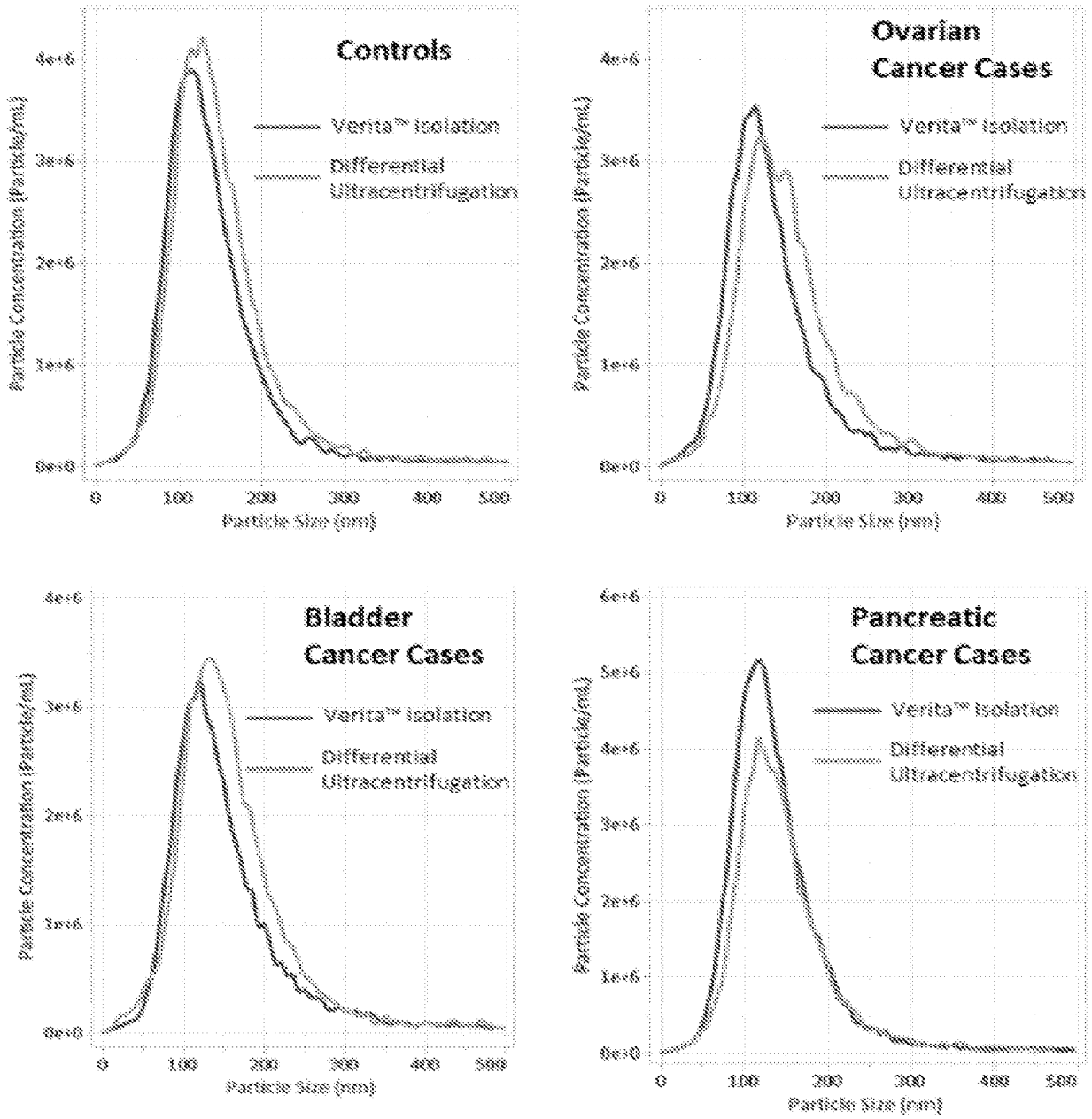

Controls
Ovarian Cancer Cases
Bladder Cancer Cases
Pancreatic Cancer Cases
Verita™ Isolation
Differential Ultracentrifugation
Particle Concentration (Particle/mL)
Particle Size (nm)
0e+0
1e+6
2e+6
3e+6
4e+6
5e+6
6e+6
0
100
200
300
400
500

FIG. 23A

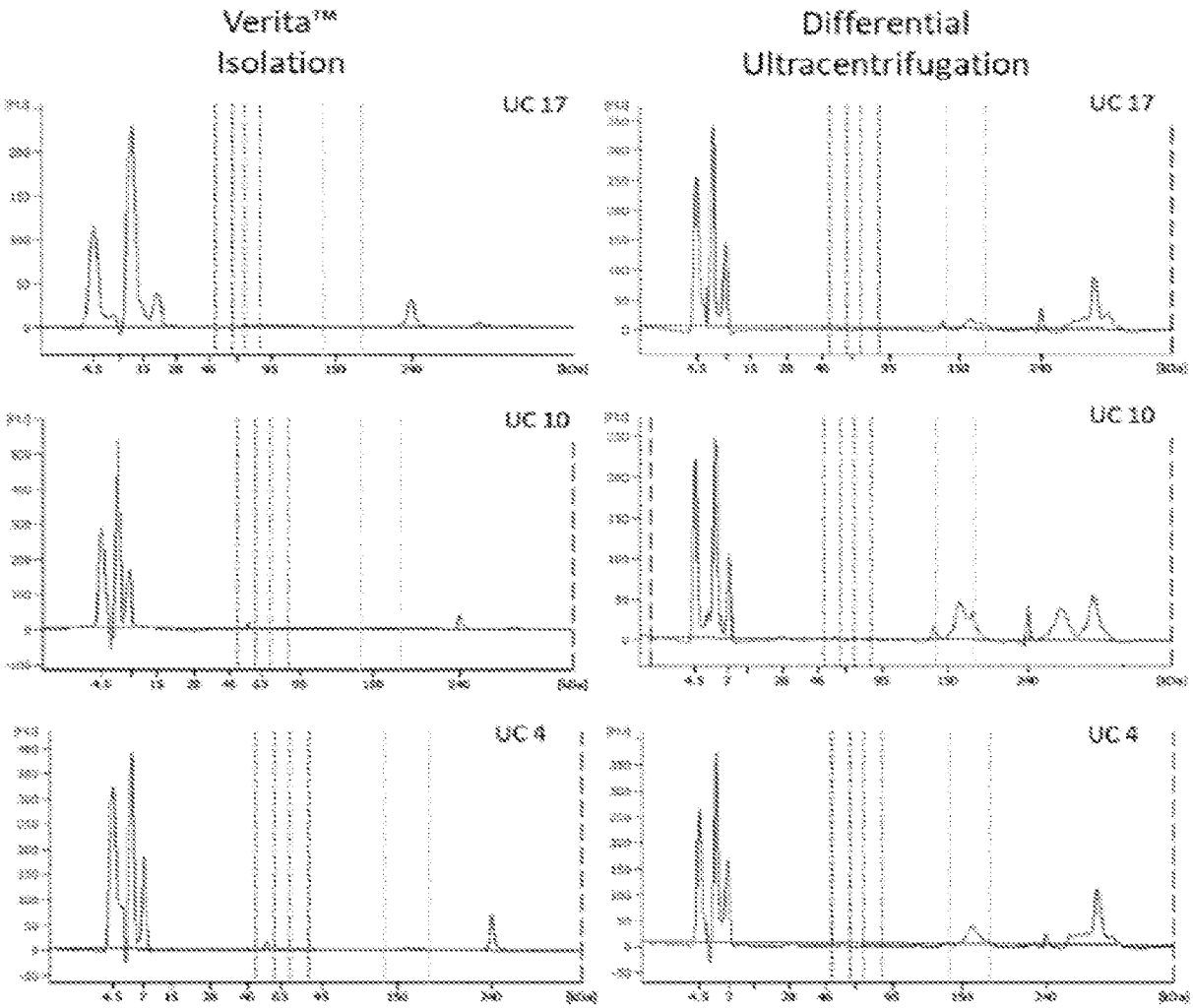

Verita™ Isolation
Differential Ultracentrifugation
UC 17
UC 17
UC 10
UC 10
UC 4
UC 4

FIG. 23B

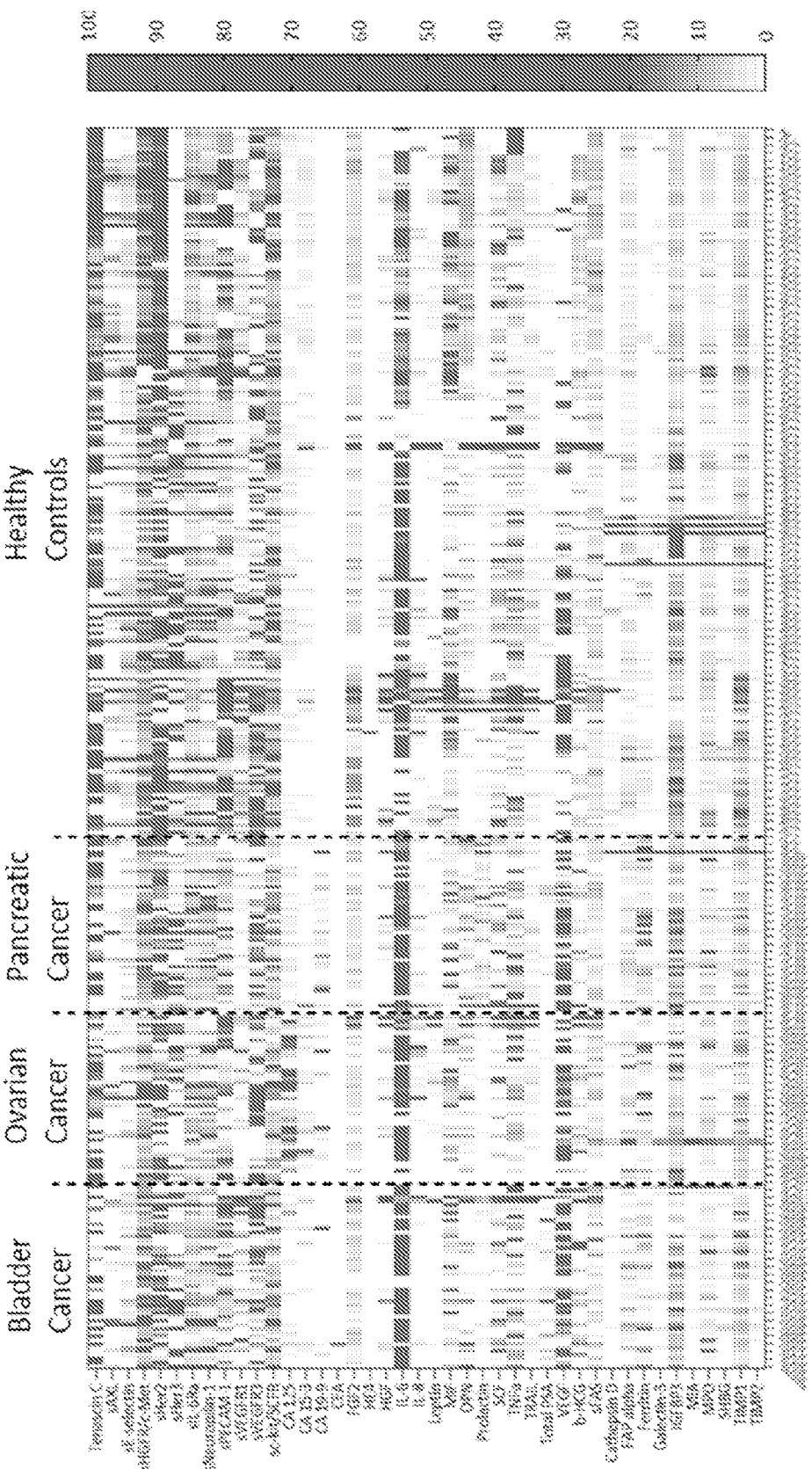

Bladder Cancer
Ovarian Cancer
Pancreatic Cancer
Healthy Controls
100
90
80
70
60
50
40
30
20
10
0

FIG. 24A

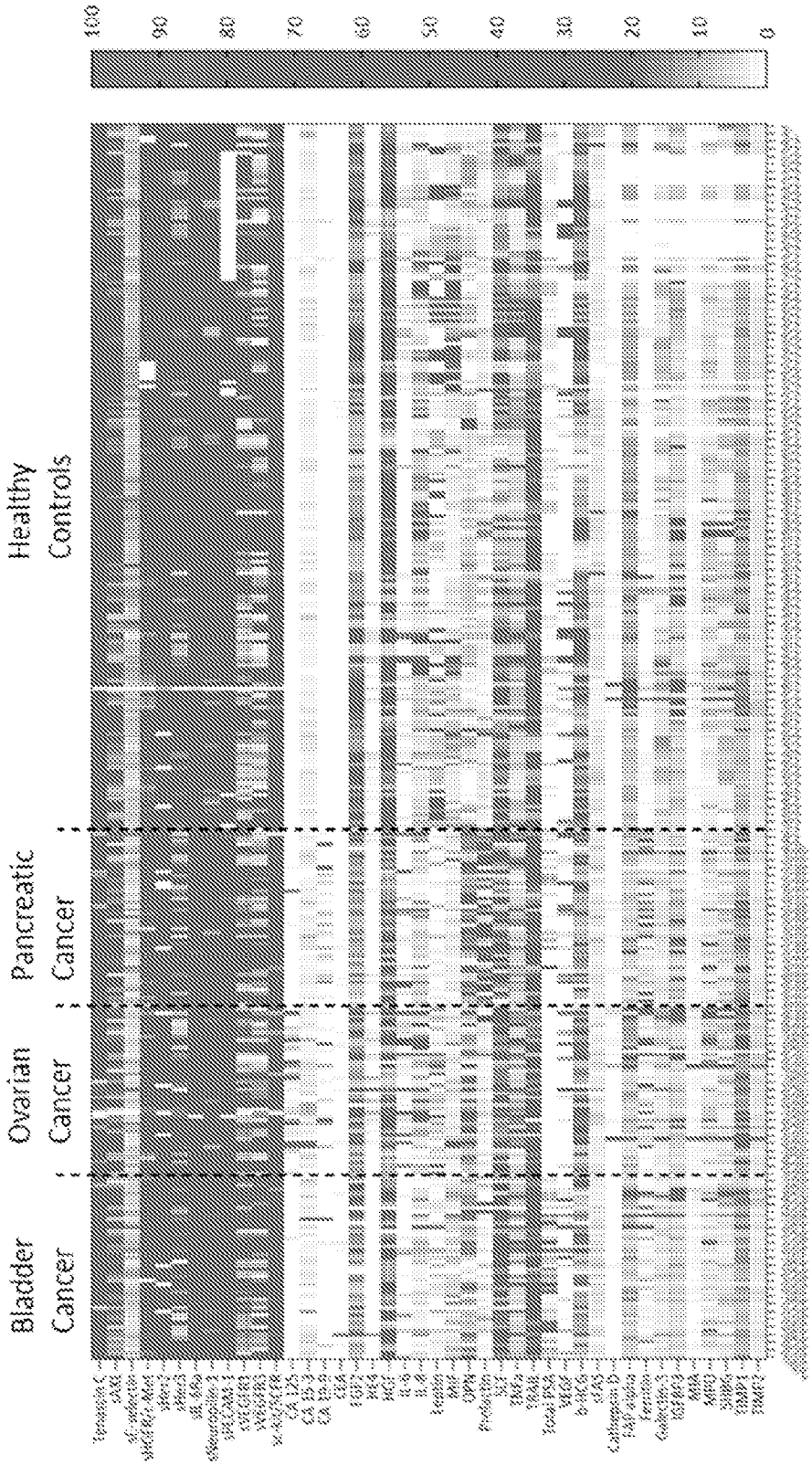

Bladder Cancer
Ovarian Cancer
Pancreatic Cancer
Healthy Controls
100
90
80
70
60
50
40
30
20
10
0

FIG. 24B

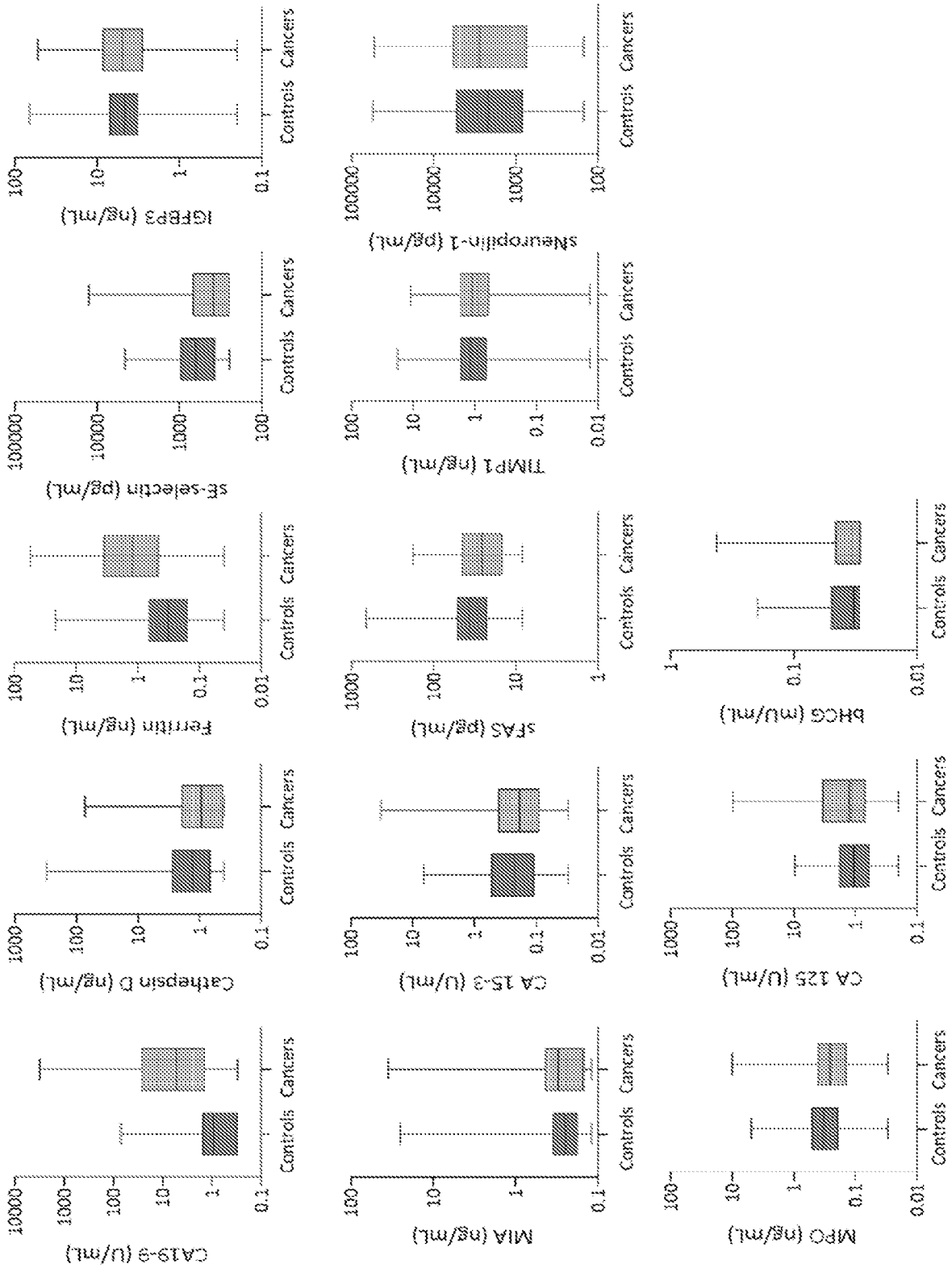

CA19-9 (U/mL)
Cathepsin D (ng/mL)
Ferritin (ng/mL)
sE-selectin (pg/mL)
IGFBP3 (ng/mL)
MIA (ng/mL)
CA 15-3 (U/mL)
sFAS (pg/mL)
TIMP1 (ng/mL)
sNeuropilin-1 (pg/mL)
MPO (ng/mL)
CA 125 (U/mL)
bHCG (mU/mL)
Controls
Cancers

FIG. 25

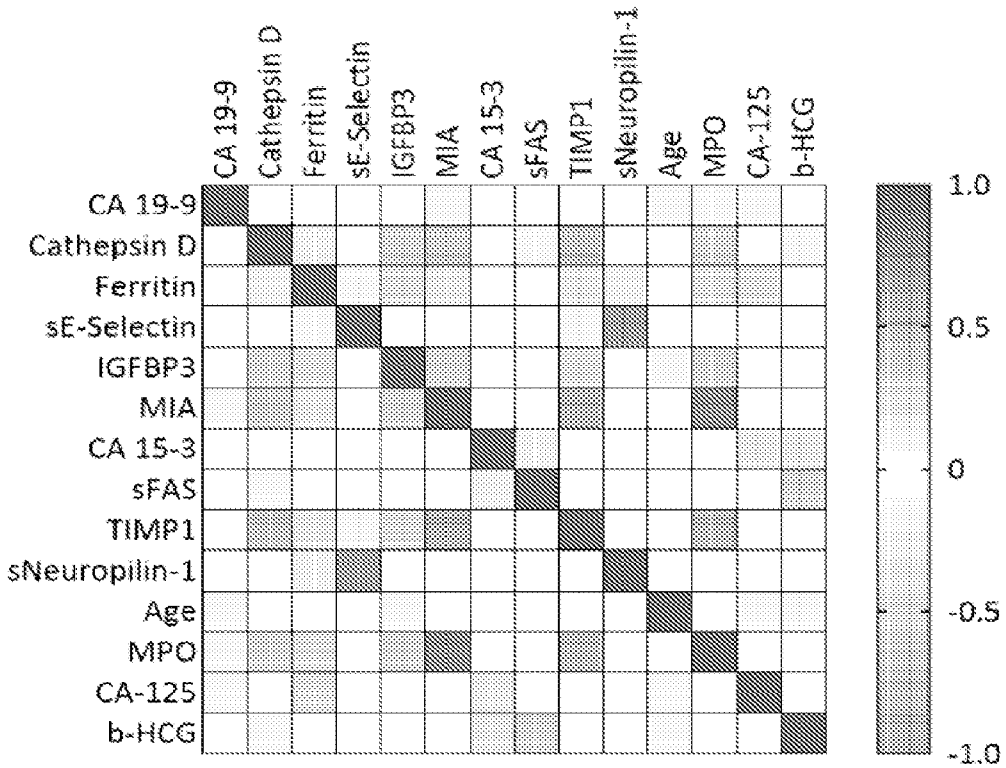

CA 19-9
Cathepsin D
Ferritin
sE-Selectin
IGFBP3
MIA
CA 15-3
sFAS
TIMP1
sNeuropilin-1
Age
MPO
CA-125
b-HCG
1.0
0.5
0
-0.5
-1.0

FIG. 26

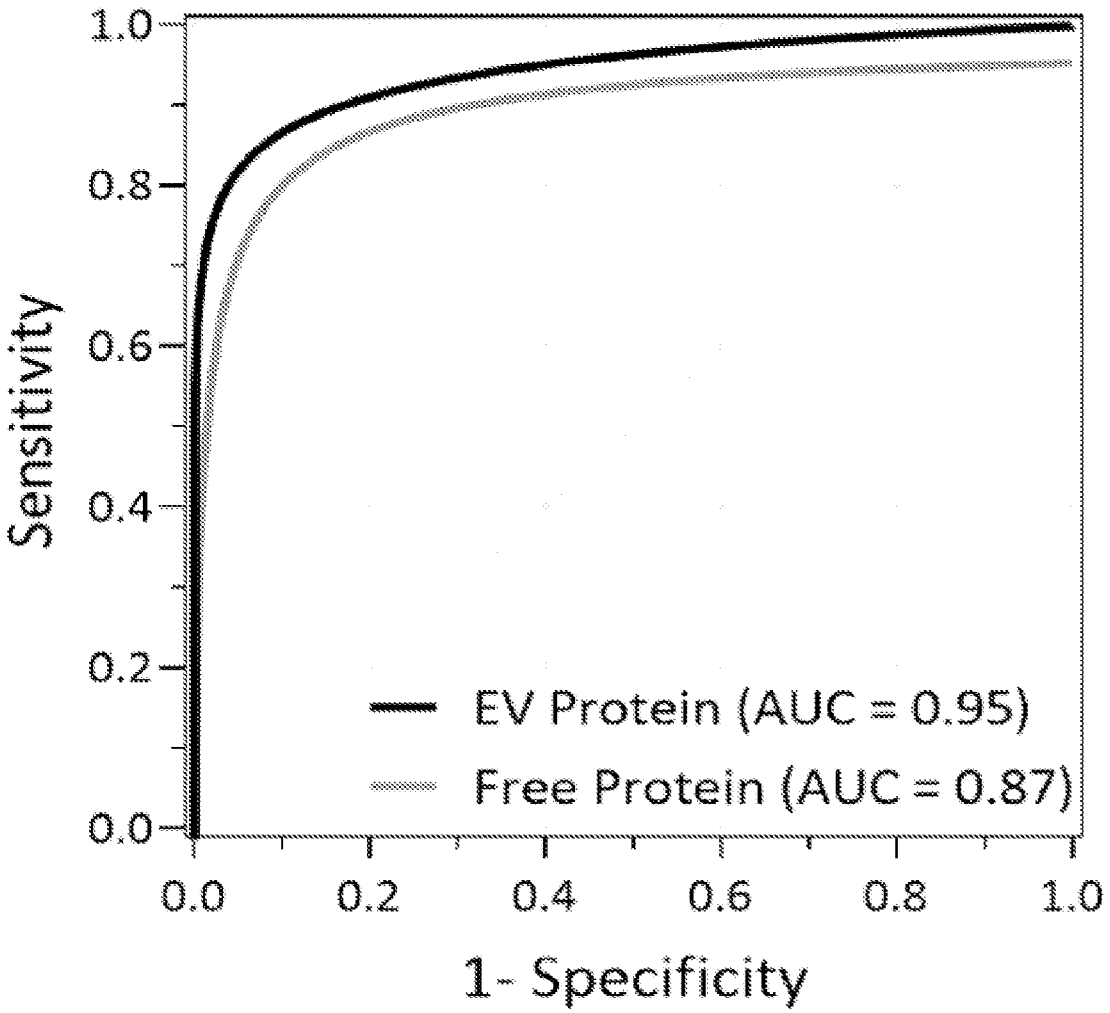
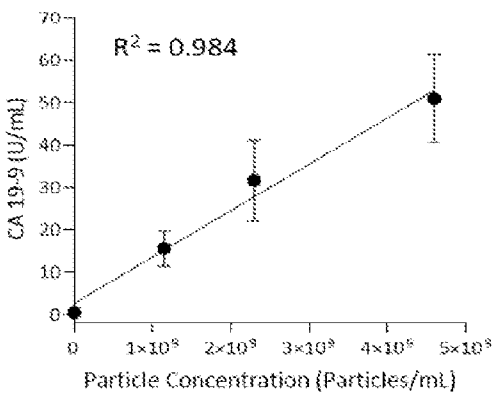
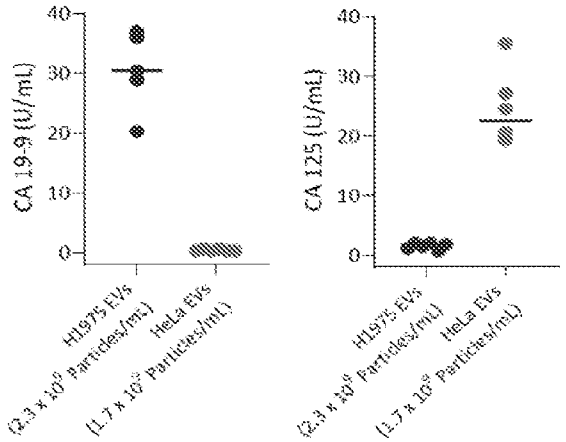


FIG. 27



H1975 EV Spike (Particles/mL)	CA 19-9 (U/mL)	
	Mean	SD
4.6×10^9	51.0	10.3
2.3×10^9	31.6	9.5
1.15×10^9	15.6	4.2
No Spike (plasma only)	0.5	0.2

FIG. 28A



EV Spike	CA 19-9 (U/mL)		CA 125 (U/mL)	
	Mean	SD	Mean	SD
H1975	30.5	6.0	1.6	0.5
HeLa	0.4	0.1	24.5	6.2

FIG. 28B

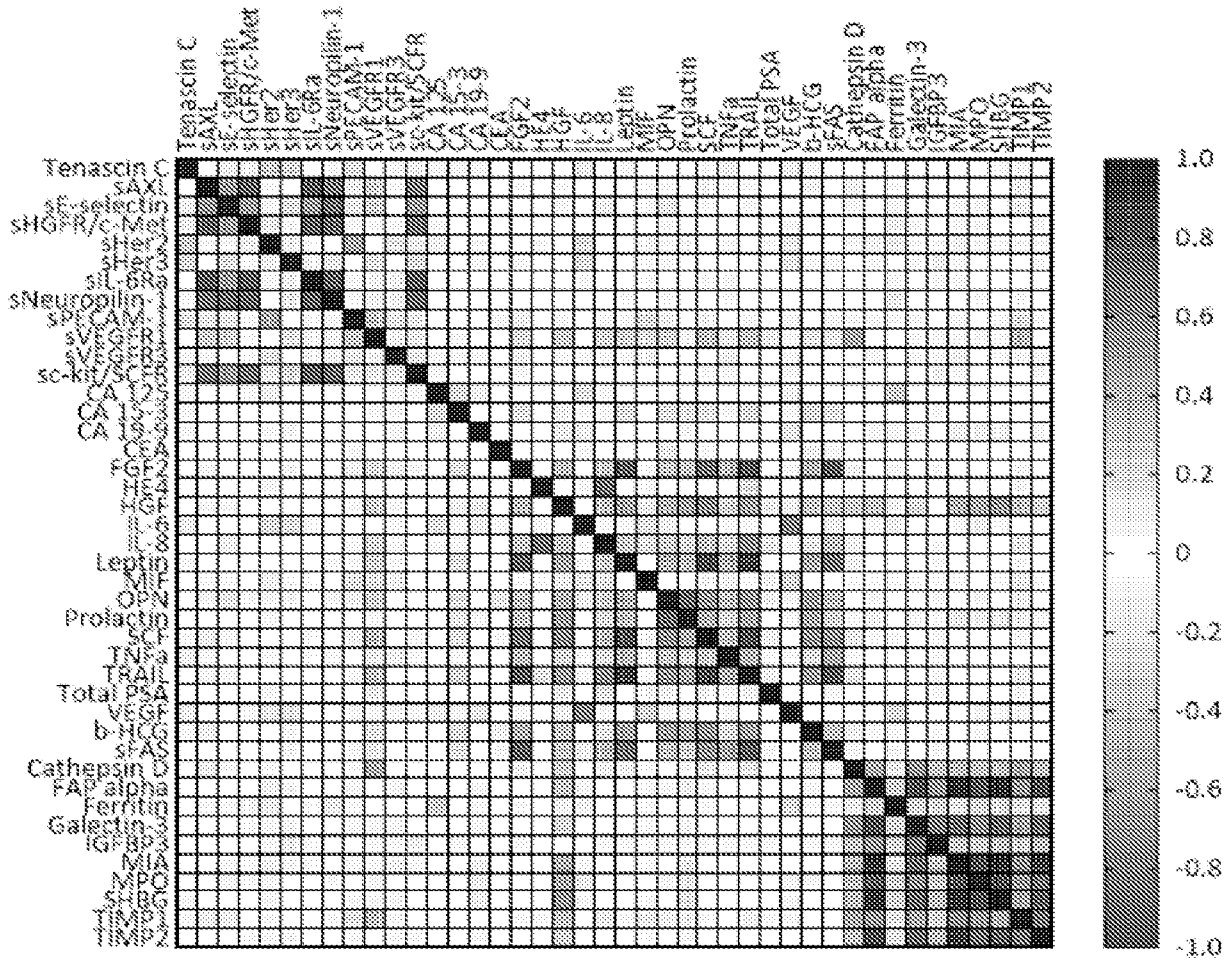


FIG. 29A

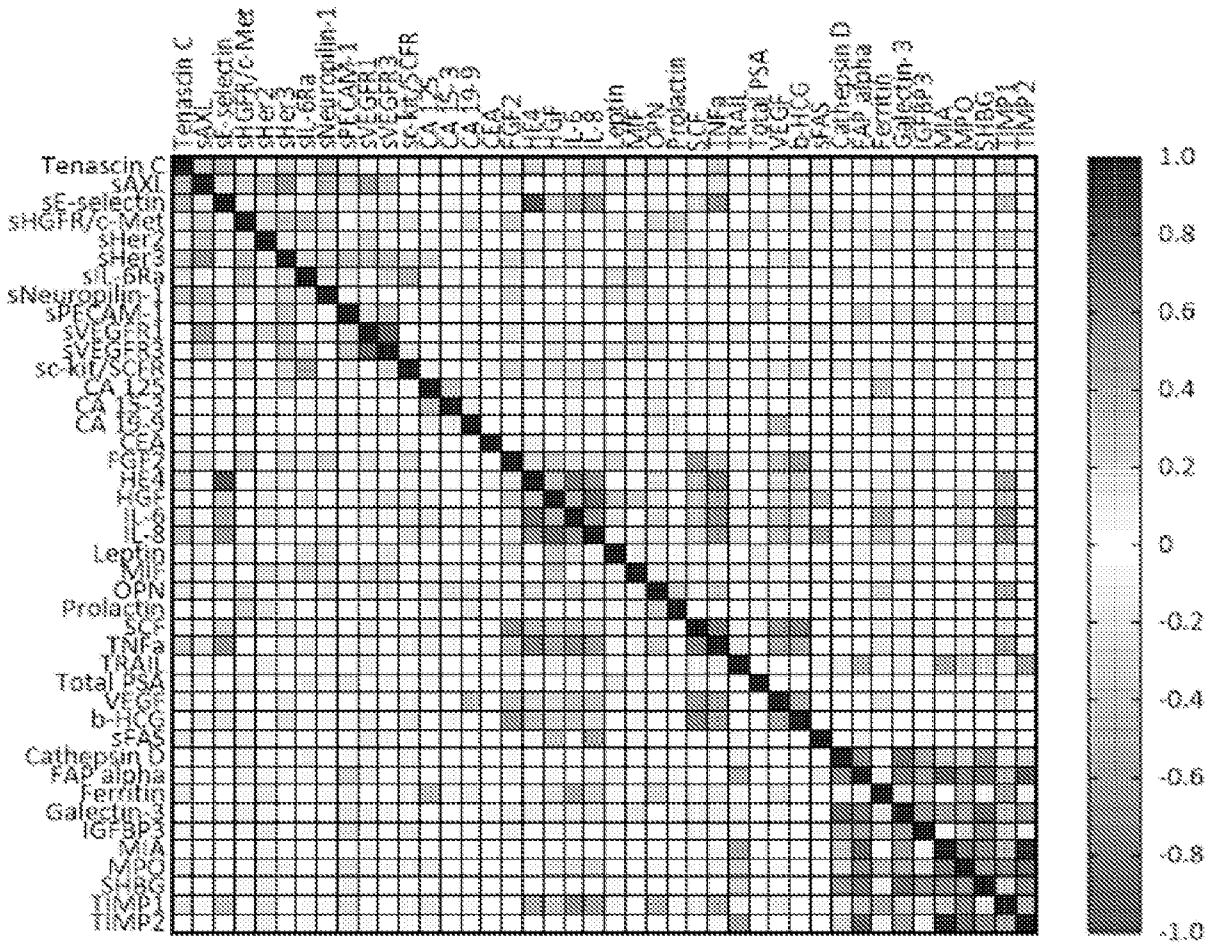

Tenascin C
sAXL
sE-selectin
sHGFR/c-Met
sHer2
sHer3
sIL-6Ra
sNeuropilin-1
sPECAM-1
sVEGFR1
sVEGFR2
sVEGFR3
sc-kit/SCFR
CA 125
CA 15-3
CA 19-9
CEA
FGF-2
HGF
IL-8
Leptin
MIF
OPN
Prolactin
SLP
TNF-a
TRAIL
Total PSA
VEGF
b-HCG
sFAS
Cathepsin D
FAP alpha
Ferritin
Galectin-3
IGFBP3
MIA
MPO
SHBG
TIMP1
TIMP2
1.0
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1.0

FIG. 29B

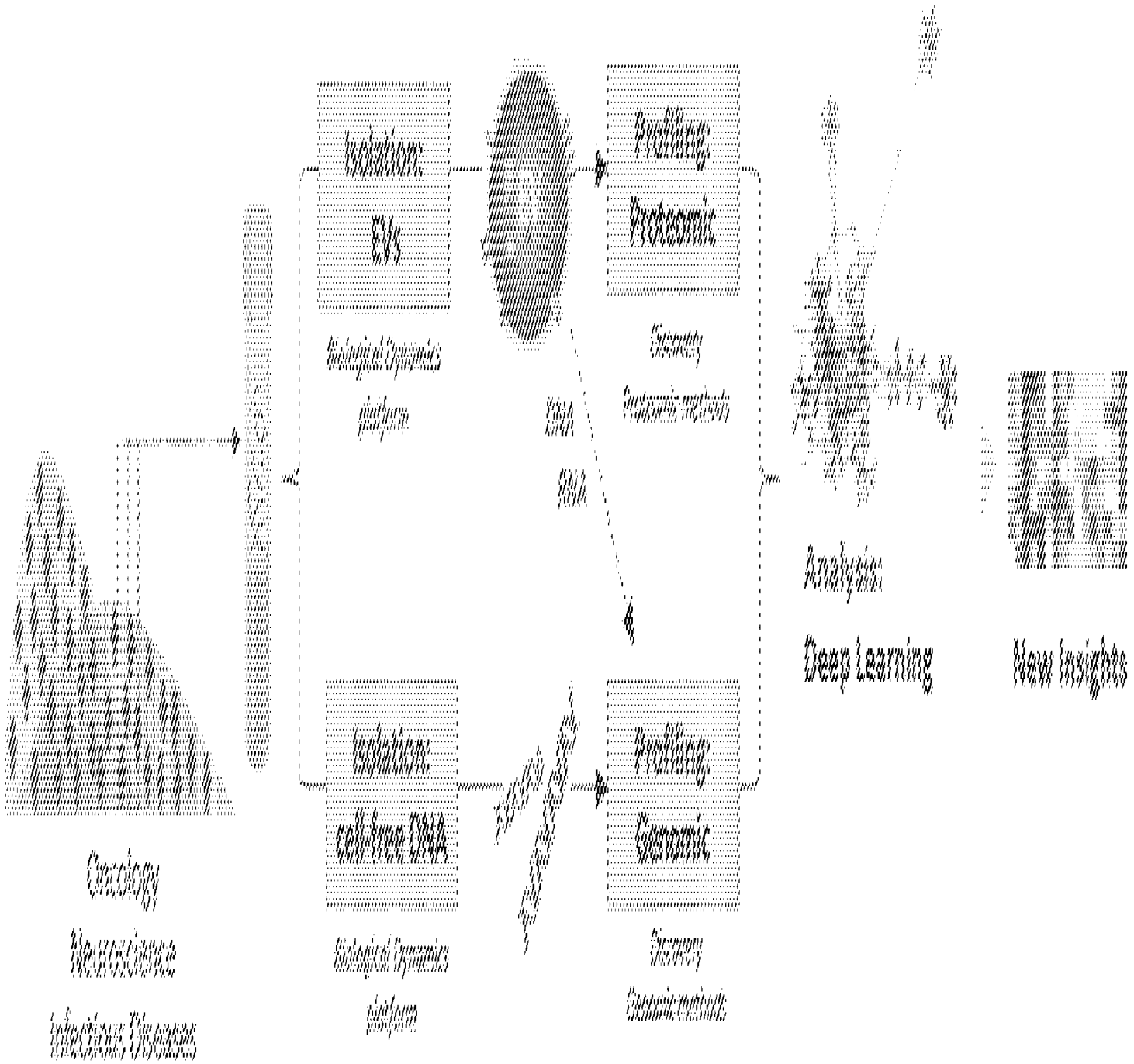


FIG. 5