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(54) **LIQUIDE SERVANT A RECUEILLIR UN SPECIMEN**

(54) **SPECIMEN COLLECTION FLUID**

(57) Liquide servant à recueillir un spécimen et comprenant une solution aqueuse contenant un aldéhyde aliphatique, à une concentration molaire de 0,15 M à 3,4 M, un ou plusieurs sels de métaux lourds, à une concentration molaire totale de $0,2 \times 10^{-3}$ M à 0,2 M, et un anticoagulant, à une concentration molaire de 0,27 M à 0,45 M, ladite solution possédant un pH situé dans une plage de 6,8 à 8.

(57) A specimen collection fluid which comprises a sterile aqueous solution comprising an aliphatic aldehyde, at a molar concentration of 0.15 M to 3.4 M, one or more heavy metal salts, at a total molar concentration of 0.2×10^{-3} M to 0.2 M, and an anticoagulant, at a molar concentration of 0.27 M to 0.45 M, the solution having a pH in the range of 6.8 to 8.0.

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<p>(21) International Application Number: PCT/GB97/01418</p> <p>(22) International Filing Date: 23 May 1997 (23.05.97)</p> <p>(30) Priority Data: 9611000.2 24 May 1996 (24.05.96) GB</p> <p>(71) Applicants (for all designated States except US): NORTHERN GENERAL HOSPITAL NHS TRUST [GB/GB]; Herries Road, Sheffield S5 7AU (GB). CENTRAL SHEFFIELD UNIVERSITY HOSPITALS NHS TRUST [GB/GB]; Royal Hallamshire Hospital, Glossop Road, Sheffield S10 2JF (GB).</p> <p>(72) Inventors; and (75) Inventors/Applicants (for US only): GRANGER, Vivian [GB/GB]; 12 Ledstone Road, Woodseats, Sheffield S8 0NS (GB). BARNETT, David [GB/GB]; 18 Holme Oak Way, Stannington, Sheffield S6 6FL (GB).</p> <p>(74) Agent: LUNT, Mark, George, Francis; Dibb Lupton Alsop, Fountain Precinct, Balm Green, Sheffield S1 1RZ (GB).</p>		<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p>Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i></p>
<p>(54) Title: SPECIMEN COLLECTION FLUID</p> <p>(57) Abstract</p> <p>A specimen collection fluid which comprises a sterile aqueous solution comprising an aliphatic aldehyde, at a molar concentration of 0.15 M to 3.4 M, one or more heavy metal salts, at a total molar concentration of 0.2×10^{-3} M to 0.2 M, and an anticoagulant, at a molar concentration of 0.27 M to 0.45 M, the solution having a pH in the range of 6.8 to 8.0.</p>		

SPECIMEN COLLECTION FLUID**Background of the Invention**

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This invention relates to specimen collection fluids, and more particularly to a specimen collection fluid for the treatment of blood and/or bone marrow specimens to be used for immunohaematological analysis.

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The current methods of immunohaematological analysis of specimens obtained from patients suffering from haematological malignancies and immunological disorders such as AIDS require the specimen to be collected into a sterile blood collection tube containing an appropriate amount of a specimen collection fluid, which is usually an anticoagulant solution. However, several studies have reported that collection of peripheral blood or bone marrow requires that such specimens should be processed within a 6, 18 or 24 hour period, depending on the test involved, to ensure antigen stability and no deterioration of sample integrity. Due to these strict time limitations, the transportation of a specimen to the analysis site is almost always required to be carried out on a very urgent basis. If analysis is delayed, for example, if a patient's specimen is obtained on a weekend or a bank holiday, or a specimen is transported from one country to another, it may not be in a suitable condition

when finally submitted to analysis, and a further specimen may need to be taken.

Stabilisation fluids presently available require the
5 collection of anticoagulated blood and then the addition
of 1ml of stabilisation fluid to 1ml of the
anticoagulated blood specimen, resulting in a
considerable dilution of the specimen, which makes the
results of the subsequent immunohaematological analysis
10 very difficult to interpret.

Commercially available stabilisation fluids also
give poor results with leukemics.

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In International patent applications nos WO 95/01796
and WO 95/27203 there are described stabilised cell
preparations prepared by treating the cells with a
stabilising agent comprising a heavy metal compound,
20 particularly a transition metal salt. The stabilising
agent may also comprise an effective amount of an
aldehyde. The stabilised cell preparations can be
stabilised whole blood preparations for use in quality
control procedures for analytical techniques.

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In French Patent No. 2331352 there is described a process
for preparing stabilised erythrocytes, wherein a
suspension of erythrocytes in an aqueous isotonic

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solution is reacted with, simultaneously or successively in any sequence, an aliphatic aldehyde and a water-soluble salt of 2- or 3- valent chromium, and the erythrocyte are subsequently washed.

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for imunohaematological analysis specimens, which in preferred embodiments, can allow the collection of a specimen directly into a specimen collection container containing the stabilisation fluid.

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It is also an object of the invention to provide a specimen collection container comprising an improved specimen collection fluid.

10 It is a further object of the invention to provide a method of collection of specimens, for example, for immunohaematological analysis, which comprises contacting the specimens with a novel specimen collection fluid providing improved storage properties without
15 substantially interfering with the analysis.

Summary of the Invention

In a first aspect the invention provides a specimen
20 collection fluid, for example, for immunohaematological analysis specimens, which comprises a sterile buffered aqueous solution comprising an aliphatic aldehyde, at a molar concentration of 0.15M to 3.4M, one or more heavy metal salts, at a total molar concentration of $0.2 \times 10^{-3}\text{M}$
25 to 0.2M, and, preferably, an anticoagulant, at a molar concentration of 0.27M to 0.45M, the solution having a pH in the range of 6.8 to 8.0.

It will be understood that in the case where blood already in an anticoagulated state is to be used, an anticoagulant is optional.

5 In another aspect the invention provides a specimen collection container for the reception of specimens for analysis, which contains a stabilising amount of a specimen collection fluid comprising a sterile aqueous solution comprising an aliphatic aldehyde, at a molar
10 concentration of 0.15M to 3.4 M, one or more heavy metal salts, at a total molar concentration of $0.2 \times 10^{-3}\text{M}$ to 0.2M, and an anticoagulant, at a molar concentration of 0.27M to 0.45M, the solution having a pH in the range of 6.8 to 8.0.

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In a further aspect the invention provides a method of collection of specimens for immunohaematological analysis and/or other analytical techniques, for example such as histopathological analysis, which comprises
20 contacting the specimen with a specimen collection fluid comprising a sterile aqueous solution comprising an aliphatic aldehyde, at a molar concentration of 0.15M to 3.4M, one or more heavy metal salts, at a total molar concentration of $0.2 \times 10^{-3}\text{M}$ to 0.2M, and an
25 anticoagulant, at a molar concentration of 0.27M to 0.45M, the solution having a pH in the range of from 6.8 to 8.0.

Detailed Description of the Invention

The invention is particularly applicable to the collection of peripheral blood and bone marrow specimens for immunohaematological analysis purposes, and will be henceforth more particularly described with reference thereto. It is to be understood, however, that the invention is not limited to the collection of such materials and is broadly applicable to a wide range of human and animal specimens collected for analytical purposes, such as analysis of pathological specimens, for example, histopathology.

The aliphatic aldehyde used in the specimen collection fluid can be any suitable aliphatic aldehyde, but is preferably formaldehyde, and most preferably paraformaldehyde. To assist in dissolving the aldehyde in the aqueous solution the solution can be warmed if necessary, but the temperature should not be allowed to rise above 50°C.

Suitable heavy metal salts are those of metals having complexing properties and having an atomic weight greater than 20, for example, transition metals, particularly transition metals of groups IVA to VIIA of the Periodic Table, for example, manganese, chromium, molybdenum, vanadium and titanium, group IB, for example, copper, and group IVB, for example, tin. Group VIA and

group VIIA, transition metals, and especially chromium and manganese, are particularly preferred. Very good results have been obtained using manganese salts which have the advantage for some purposes that they have
5 colourless solutions, and especially, mixtures of manganese and chromium salts.

Any suitable water soluble salts of such heavy metals may be used, especially inorganic acid salts, for
10 example, sulphates, and particularly, chlorides. Particularly good results have been obtained using chromium and manganese compounds, for example, chromium salts such as chromic chloride CrCl_3 , and manganese salts such as manganese chloride MnCl_2 , and these are the
15 preferred metal salts for use in the present invention.

Any suitable anticoagulant can be used, although EDTA salts are preferred, for example, alkali metal salts, such as, di-potassium ethylenediaminetetraacetic
20 acid (K_2EDTA) and tri-potassium ethylenediaminetetraacetic acid (K_3EDTA). other anticoagulants which can be used include citrate/phosphate/dextrose/adenine (CPDA).

Preferred specimen collection fluids in accordance
25 with the invention comprise aqueous solutions of paraformaldehyde, manganese and chromium chloride, and an anticoagulant. Preferably, the weight ratio of manganese

to chromium is in the range of from 100:1 to 50:1, for example about 75:1.

The aqueous solution preferably comprises from 0.15
5 moles to 1.0 moles of the aliphatic aldehyde, from $0.2 \times 10^{-3}\text{M}$ to 0.1 moles of the heavy metal salts, and from 0.27 to 0.45 moles of the anticoagulant. The aqueous solution preferably has a pH in the range of 7.2 to 7.6, for example, about 7.4.

10

The specimen collection fluid preferably also comprises one or more cell nutrients, for example, dextrose, adenosine tri-phosphate and inosine, and in amounts of respectively up to about 2.5M, 0.05M and 0.1M,
15 and glycolytic pathway precursors, for example, dihydroxy acetone and 2,3-diphosphoglycerol. Tri-sodium citrate and sodium chloride are, however, preferably omitted.

20 The specimen collection fluid preferably also comprises one or more antibiotics, to prevent bacterial growth which may otherwise occur, especially with nutrients present. Antibiotics, for example, chloramphenicol and neomycin sulphate, have been found to
25 be suitable, in amounts of up to about 0.015M and 0.005M respectively.

The specimen collection fluid preferably also comprises a platelet stabiliser, for example magnesium chloride or iodoacetamide or its derivatives.

5 The specimen collection fluid can be used freshly made, or, if preferred, can be allowed to stand before use. It has been observed with some solutions of chromium compounds that the freshly made solutions give rise to the formation of a precipitate which it is
10 believed may be a chromium hydroxy polymeric species. The precipitate is preferably filtered off from the solution before use. The formation of the precipitate will, of course, lower the concentration of heavy metal ions in the solution, and if this should occur, an
15 analysis of the solution should be carried out to determine whether the concentration of the heavy metal salt is still within the preferred range.

The specimen collection container can, for example,
20 be any suitable glass or plastics container of the type used in conventional blood collection systems for the collection of peripheral blood or bone marrow. The container can, for example, comprise a glass or plastic tube of capacity from 1 to 10ml, preferably about 5ml,
25 excluding any air space, which has been rendered sterile by irradiation. Typically the specimen collection container will have a volume capable of containing at least ten micro-litres, and preferably 20 to 100 micro-

litres, of specimen collection fluid, for example, about 50 microlitres.

In the collection method of the invention, blood or
5 bone marrow may be drawn by any of the methods currently employed in the art of venesection directly into the specimen collection container. In general, aliquots of 5ml of blood or bone marrow are suitable for most analytical purposes, and these can be drawn into the
10 specimen collection container of the invention which may contain, for example, about 50 micro-litres of the novel specimen collection fluid.

The ratio of the volume of the specimen to the
15 volume of the specimen collection fluid is preferably from 30:1 to 125:1.

By use of preferred embodiments of the specimen collection fluid, container and method of the invention,
20 it has been found that immunohaematological analysis can be performed upon peripheral blood after more than 5 days and up to 7 days following collection without substantial deterioration in the antigen or cellular integrity. With preferred specimen collection fluids and methods of the
25 invention it has been found that the leucocyte and platelet antigens CD3, CD4, CD5, CD8, CD10, CD13, CD16, CD14, CD19, CD20, CD33, CD34, HLA-DR, and CD45, and also the haematological parameters normally measured, for

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example, white cell count, red cell count, platelet count, white cell differential and haemoglobin, can remain substantially stable during this period. Because the white cell count remains substantially constant
5 throughout, this assists in the determination of absolute values for antigens such as CD4 and CD34. RNA can be extracted from specimens for up to 5 days after collection, for example, for PCR analytical techniques.

10 The specimen collection fluid, container and method of the invention offer significant benefits in the management of disorders such as AIDS. The peripheral blood parameters remain substantially stable, facilitating the transportation of specimens over long
15 distances or allowing retention of specimens until times which are convenient for analysis. The addition of small amounts of the specimen collection fluid, usually around one in 100 parts, does not introduce a significant dilution factor which will affect the absolute value
20 calculations.

The invention is illustrated by the following Examples:

EXAMPLE 1

A specimen collection fluid is made up comprising a sterile aqueous solution containing the following components by weight:

paraformaldehyde	1.5 Molar
manganese chloride	0.125 Molar
K ₂ EDTA	0.37 Molar

The pH of the solution is adjusted to 7.4 and the solution filtered. 50µl of the solution is placed in a 7ml glass specimen collection tube. A 24-hour-old blood sample which had been collected from a healthy donor into CPDA is taken and 5ml drawn off into the tube. The contents of the tube are thoroughly mixed. The tube is preferably stored at 4°C and the contents allowed to warm up to room temperature before testing.

The specimen is tested on a Becton Dickinson flow cytometer after 5 days and compared with a similar unstabilised control. The results for forward and side scatter (FSC) are shown in Figures 1 and 2 (stabilised specimen) and Figures 3 and 4 (control). It can be seen that, whilst the stabilised specimen is comparatively unaffected, the non-lymphocytes and debris have built up in the control specimen to the extent that the measurements are regarded as unreliable.

Whilst in the above Example the specimen is taken into CPDA anticoagulant, similar results can be obtained when the specimen is drawn directly into the specimen collection fluid without prior addition of anticoagulant.

5

EXAMPLE 2

A specimen collection fluid is made up comprising a sterile aqueous solution containing the following components by weight:

	Paraformaldehyde	0.33 Molar
	Dextrose (D-glucose)	2.22 Molar
15	Adenosine tri phosphate	0.036 Molar
	Inosine	0.075 Molar
	Chloramphenicol	0.012 Molar
	Neomycin Sulphate	0.0044 Molar
	Chromium (III) Chloride	0.019 Molar
20	Manganese Chloride	0.025 Molar
	Magnesium Chloride	0.52 Molar

The pH of the solution is adjusted to 7.4 and a heavy precipitate is formed. The solution is centrifuged at 1200g to separate the precipitate from the supernatant. The supernatant is removed and filtered to remove any remaining particles.

K₃EDTA is added to make a final concentration of 0.34 Molar and the solution filtered again. 54µl of the solution is placed in a 4.5ml glass specimen collection tube. Blood drawn by venepuncture is immediately placed
5 into the tube. The tubes contents are thoroughly mixed by inversion, to anticoagulate the fresh blood and initiate the stabilisation process. The tube is stored preferably at 4°C and the contents allowed to warm up to room temperature before testing.

10

The specimen is tested on a Becton Dickinson flow cytometer after 5 days and compared to an unstabilised control. The results for CD45+ staining and side scatter are shown in Figures 5 and 6 (stabilised sample) and
15 Figures 7 and 8 (control). It can be seen that whilst the stabilised specimen is comparatively unaffected, the granulocytes have degraded and the amount of debris has markedly increased in the control specimen to the extent that the measurements are regarded as unreliable.

20

Whilst in the above example the specimen is anticoagulated by the K₃EDTA present in the stabilising fluid, similar results can be obtained by adding the stabilising fluid (without the K₃EDTA) directly into a
25 previously anticoagulated specimen.

Stabilised specimens in accordance with the invention can be tested on haematology analyzer machines

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such as a Coulter STKS without any rejection and give normal red cell and white cell counts. Figure 9 shows a full blood count profile of a stabilised specimen 3 days post venepuncture. Tables 1 and 2 of Figure 10 show
5 respectively absolute values and percentage values for white cell differential over a 5 day period measured on a specimen stabilised in accordance with the procedure of Example 2.

10 It is also found that stabilised specimens in accordance with the invention have minimal haemolysis over a 7 day period.

In Figure 11, lane C5 shows the results of RT-PCR
15 products from a 5 day old stabilised whole blood sample.

Typical values for RNA content in µg/ml over a 5 day period for unstabilised and stabilised samples are as follows:

20

Unstabilised sample, day zero	495 µg/ml RNA
Unstabilised sample, day five	215 µg/ml RNA
Stabilised sample, day zero	340 µg/ml RNA
Stabilised sample, day five	240 µg/ml RNA

25

The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application

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and which are open to public inspection with this specification, and the contents of all such papers and comments are incorporated herein by reference.

5 All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features
10 and/or steps are mutually exclusive.

Each feature disclosed in this specification (including any accompanying claims, abstract and drawings), may be replaced by alternative features
15 serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

20

The invention is not restricted to the details of the foregoing embodiments. The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any
25 accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

CLAIMS

1. A specimen collection fluid which comprises a sterile buffered aqueous solution comprising an aliphatic aldehyde, at a molar concentration of 0.15M to 3.4M, one or more heavy metal salts, at a total molar concentration of $0.2 \times 10^{-3}\text{M}$ to 0.2M, the solution having a pH in the range of 6.8 to 8.0.
2. A specimen collection fluid according to Claim 1, in which an anticoagulant is provided.
3. A fluid according to Claim 2 in which the anticoagulant is provided at a molar concentration of 0.27M to 0.45M.
4. A specimen collection fluid according to any preceding claim, suitable for pathological analysis.
5. A specimen collection fluid according to any preceding claim, suitable for haematological analysis.
6. A specimen collection fluid according to any of Claims 1 to 4, suitable for histological analysis.

7. A specimen collection fluid according to any of the preceding claims, wherein the aliphatic aldehyde is paraformaldehyde.
- 5 8. A specimen collection fluid according to any of the preceding claims, in which the heavy metal salt is a salt of a transition metal.
9. A specimen collection fluid according to Claim 8, in
10 which the transition metal is chromium and/or manganese.
10. A specimen collection fluid according to any of the preceding claims, in which the heavy metal salt is
15 a chloride.
11. A specimen collection fluid according to any of Claims 2 to 10, in which the anticoagulant is an EDTA salt.
- 20 12. A specimen collection fluid according to any of the preceding claims, which comprises an aqueous solution of paraformaldehyde, manganese chloride, chromium chloride and an anticoagulant.
- 25 13. A specimen collection fluid according to any of the preceding claims, which comprises from 0.15M to 3.4 moles of the aliphatic aldehyde, from $0.2 \times 10^{-3}\text{M}$ to

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0.2 moles of the heavy metal salt, and from 0.27 to 0.45 moles of the anticoagulant.

14. A specimen collection fluid according to any of the preceding claims, which also comprises one or more cell nutrients.
15. A specimen collection fluid according to any of the preceding claims, which also comprises one or more antibiotics.
16. A specimen collection fluid according to any of the preceding claims, which also comprises a platelet stabiliser.
17. A specimen collection fluid according to claim 16, in which the platelet stabiliser is magnesium chloride.
18. A specimen collection fluid according to any of the preceding claims, in which the aqueous solution has a pH in the range of 7.2 to 7.6.
19. A specimen collection fluid substantially as described in the Example.
20. A specimen collection fluid substantially as hereinbefore described.

21. A specimen collection container for the reception of specimens for analysis, which contains a stabilising amount of a specimen collection fluid comprising a sterile aqueous solution comprising an aliphatic aldehyde, at a concentration of 0.15M to 3.4M, one or more heavy metal salts, at a total concentration of $0.2 \times 10^{-3}\text{M}$ to 0.2M, the solution having a pH in the range of 6.8 to 8.0.
22. A container according to Claim 21 wherein the solution further comprises an anticoagulant, at a concentration of 0.27M to 0.45M.
23. A container according to Claims 21 or 22, which contains a solution according to any of Claims 1 to 20.
24. A container according to any of Claims 21 to 23, which has a capacity of from 1 to 10ml and contains from 10 to 100 μl of the solution.
25. A container according to any of Claims 21 to 24 substantially as hereinbefore described.
26. A method of collection of specimens for haematological analysis, which comprises contacting the specimen with a specimen collection fluid comprising a sterile aqueous solution comprising an

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aliphatic aldehyde, at a concentration of from 0.15M to 3.4M, one or more heavy metal salts, at a total molar concentration of from $0.2 \times 10^{-3}M$ to 0.2M, the solution having a pH in the range of from 6.8 to 8.0.

- 5
27. A method according to Claim 26, in which the fluid further comprises an anticoagulant, at a concentration of from 0.27M to 0.45M.
- 10
28. A method according to Claim 26 or 27, in which there is used a solution according to any of Claims 1 to 20.
- 15
29. A method according any of claims 26 to 28, in which the specimen is taken directly into or transferred to a specimen collection container containing the specimen collection fluid.
- 20
30. A method according to any of Claims 26 to 29, in which the ratio of the volume of the specimen to the volume of the specimen collection fluid is from about 30:1 to 125:1.
- 25
31. A method according to any of Claims 26 to 30 substantially as described in the Examples.

21

32. A method according to any of Claims 26 to 31
substantially as hereinbefore described.

5 33. A haematological analysis specimen stabilised by a
specimen collection fluid according to any of Claims
1 to 20.

34. Use of a sterile buffered aqueous solution comprising an aliphatic aldehyde, at a molar concentration of 0.15M to 3.4M, and one or more heavy metal salts, at a total molar concentration of $0.2 \times 10^{-3}M$ to 0.2M, the solution having a pH in the range of 6.8 to 8.0, as a specimen collection fluid.
35. Use according to Claim 34, in which an anticoagulant is provided in the specimen collection fluid.
36. Use according to Claim 35, in which the anticoagulant is provided at a molar concentration of 0.27M to 0.45M.
37. Use according to any of claims 34 to 36, in which the specimen collection fluid is suitable for pathological analysis.
38. Use according to any of claims 34 to 37 in which the collection fluid is suitable for haematological analysis.
39. Use according to any of Claims 34 to 37, in which the specimen collection fluid is suitable for histological analysis.

40. Use according to any of claims 34 to 39, wherein the aliphatic aldehyde is paraformaldehyde.
41. Use according to any of claims 34 to 40, in which
5 the heavy metal salt is a salt of a transition metal.
42. Use according to Claim 41, in which the transition metal is chromium and/or manganese.
- 10 43. Use according to any of claims 34 to 43, in which the heavy metal salt is a chloride.
44. Use according to any of Claims 35 to 43, in which
15 the anticoagulant is an EDTA salt.
45. Use according to any of claims 34 to 44, in which the fluid comprises an aqueous solution of paraformaldehyde, manganese chloride, chromium
20 chloride and an anticoagulant.
46. Use according to any of claims 34 to 45, in which the fluid comprises from 0.15M to 3.4 moles of the aliphatic aldehyde, from $0.2 \times 10^{-3}M$ to 0.2 moles of
25 the heavy metal salt, and from 0.27 to 0.45 moles of the anticoagulant.

47. Use according to any of claims 34 to 46, in which the specimen collection fluid also comprises one or more cell nutrients.
- 5 48. Use according to any of claims 34 to 47 in which the fluid also comprises one or more antibiotics.
49. Use according to any of claims 34 to 48, in which the specimen collection fluid also comprises a
10 platelet stabiliser.
50. Use according to claim 49, in which the platelet stabiliser is magnesium chloride.
- 15 51. Use according to any of claims 34 to 50, in which the aqueous solution has a pH in the range of 7.2 to 7.6.

1 / 20

LeucoGATE (1)

FIG. 1

#14:45M1904001

Gate: FSC SSC

64 51

255 51

255 0

64 0

SSC



FSC

Mean: 124 20

Gated Events: 4705
Total Events: 15000

Leu M3



HLe-1

Quadrant correction: Yes

Gate Description:	%Lymphs	%Monos	%Grans	%Debris	%Lymphs of total
	97	1	2	1	98

White cell count: 6.1×10^3 cells/cu mm %Lymphs: 31.0Three Part Differential% of Leucocytescells / cu mm

Lymphocytes

31

1890

Monocytes

7

430

Granulocytes

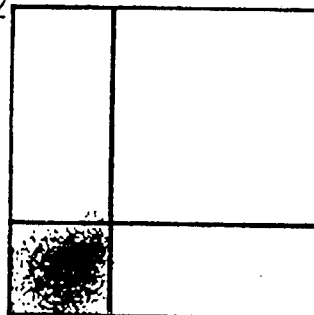
62

3780

Control (1)

14:45M1904002

Gamma-2



Gamma-1

Quad

Cell Type

Corr %L

Cells cu mm

1

NSS PE

0

0

2

NSS++

0

0

3

Unstained

100

1890

4

NSS FITC

0

0

Markers:

FL1 84

FL2 76

FSC Mean: 124

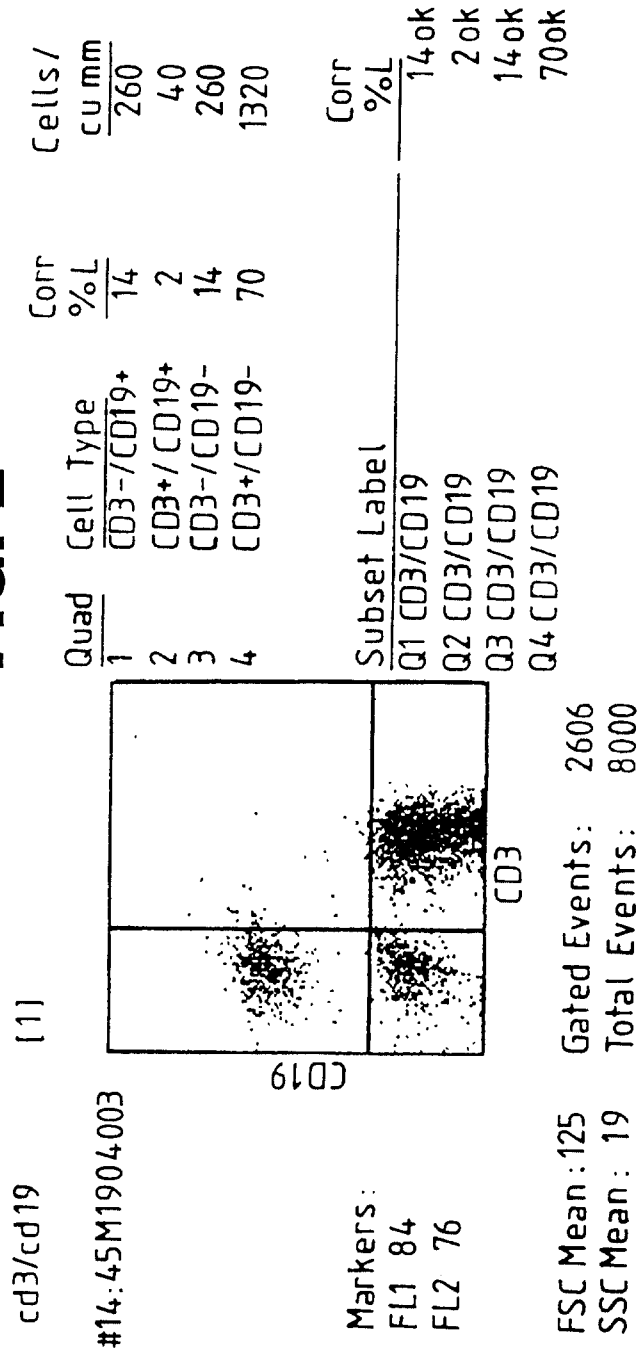
Gated Events: 2582

SSC Mean: 20

Total Events: 8000

2 / 20

FIG. 2



3 / 20

LeucoGATE [1]

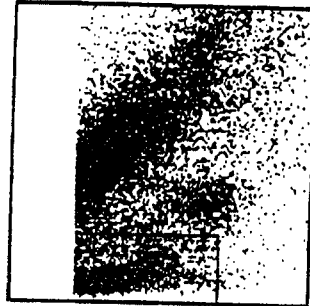
FIG. 3

#14:CONT190001

Gate: FSC SSC

70	58
175	58
175	0
70	0

SSC

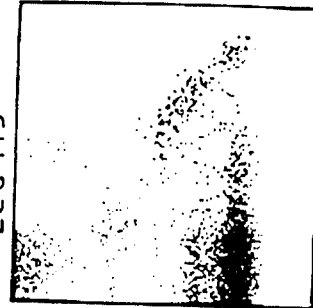


FSC

Mean: 99 26

 Gated Events: 3477
 Total Events: 15000

Leu M3



HLe-1

Quadrant correction: Yes

Gate Description:	%Lymphs	%Monos	%Grans	%Debris	%Lymphs of total
	80	2	11*	7	97

White cell count: 6.1×10^3 cells/cu mm %Lymphs: 22.0Three Part Differential% of Leucocytescells / cu mm

Lymphocytes

22

1340

Monocytes

9

550

Granulocytes

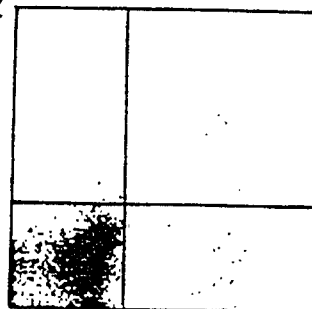
70

4270

Control [1]

14:CONT190002

Gamma-2



Gamma-1

Markers:

FL1 92

FL2 88

QuadCell TypeCorr %LCells cu mm

1

NSS PE

0

0

2

NSS++

0

0

3

Unstained

99

1330

4

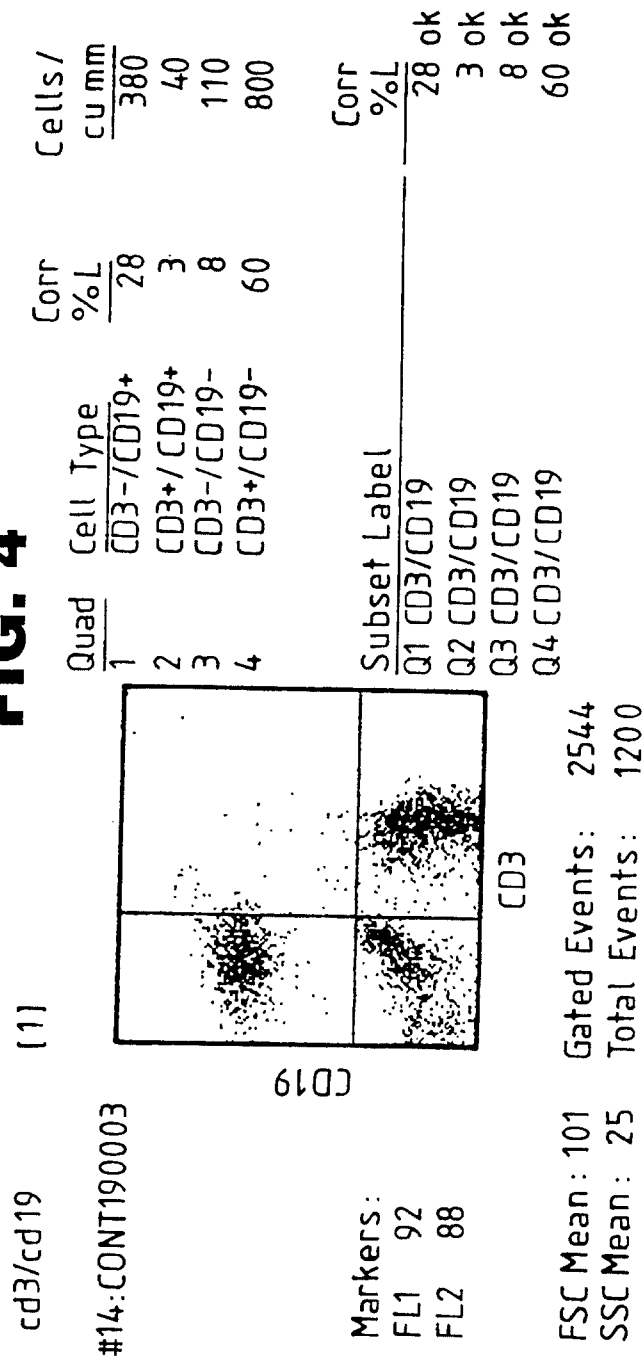
NSS FITC

1

10

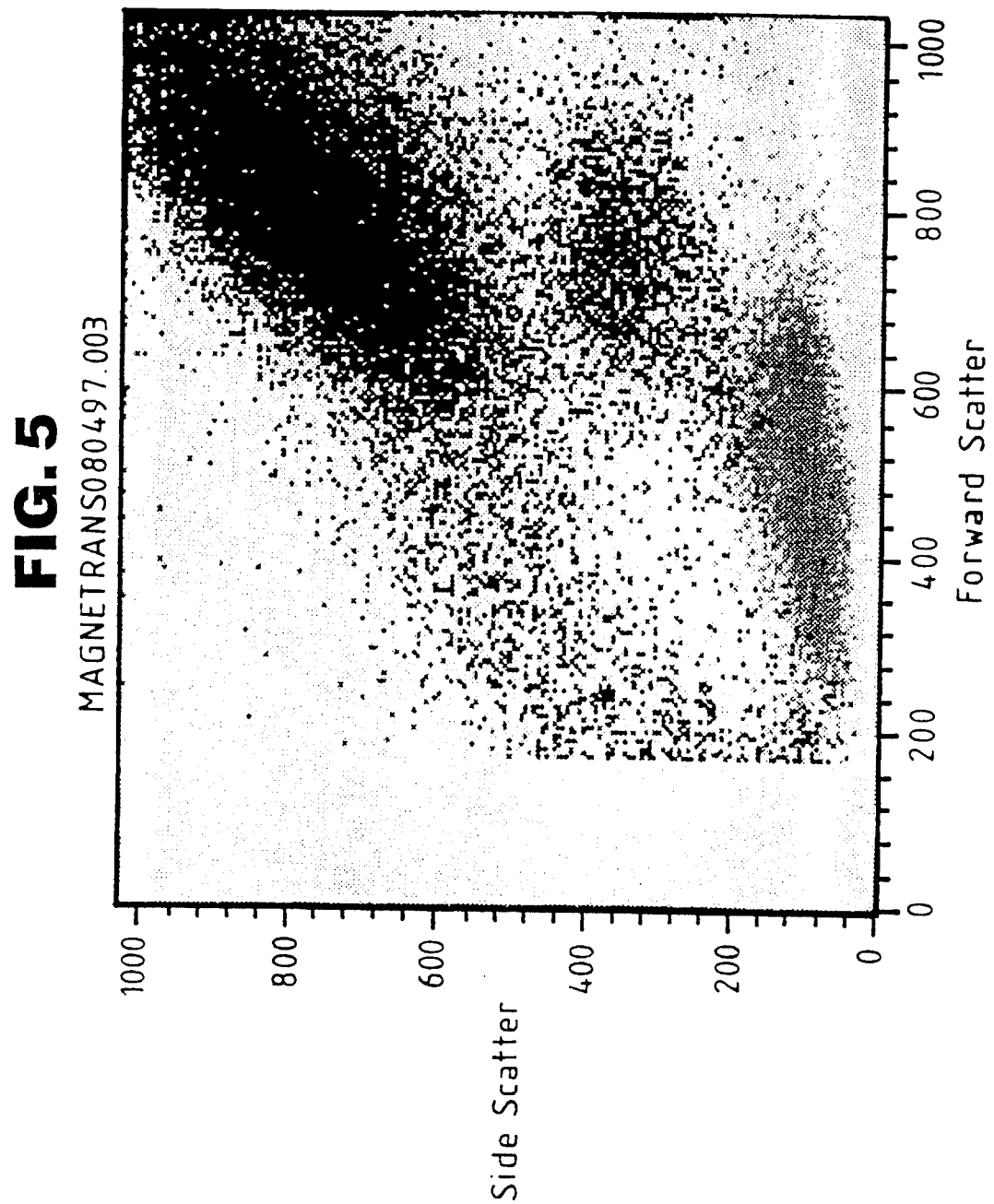
 FSC Mean: 100 Gated Events: 2728
 SSC Mean: 25 Total Events: 12000

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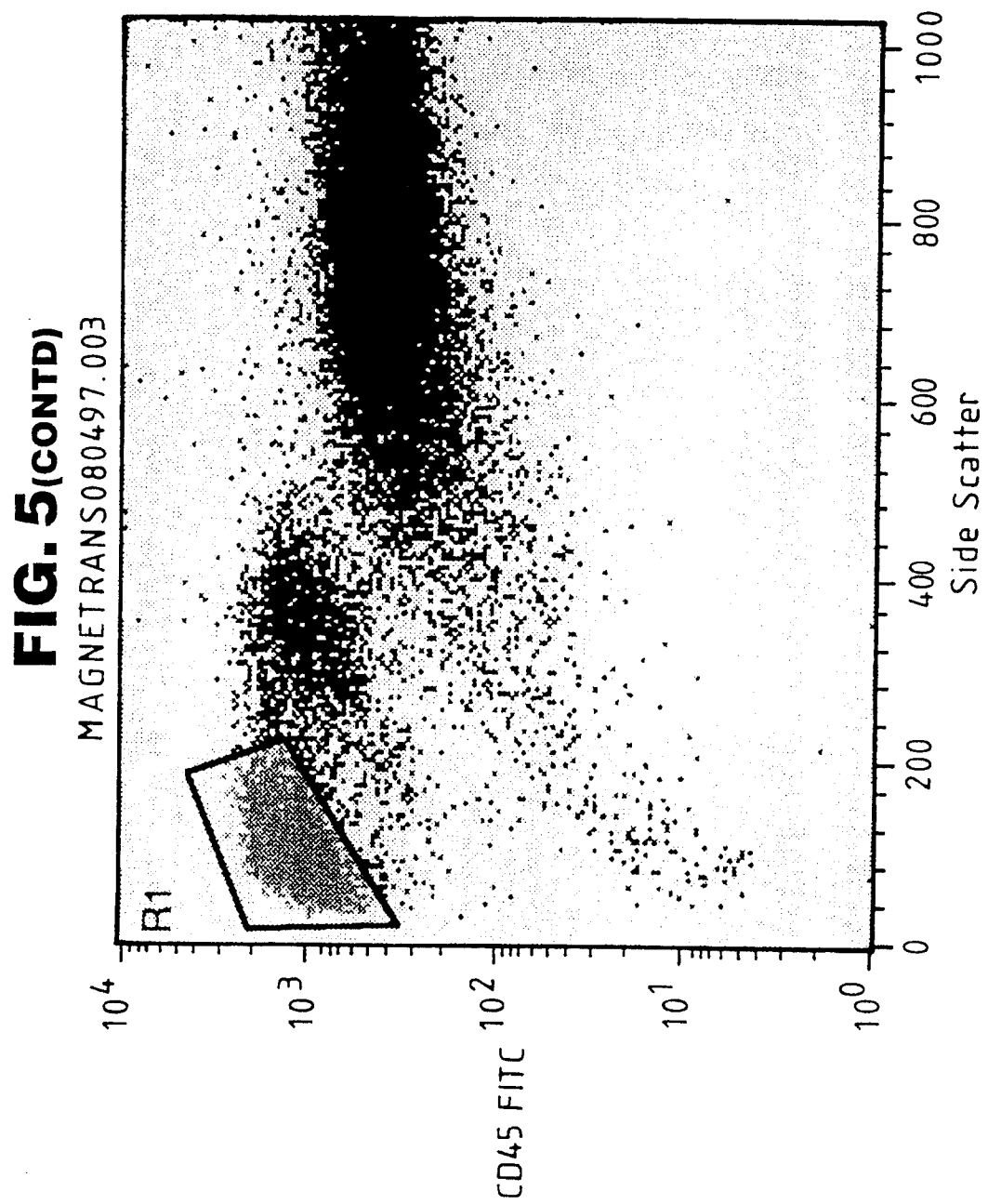
FIG. 4

>> Results for this Simultest are suspect due to non-lymphs in gate. <<
For research use only. Not for use in diagnostic or therapeutic procedures.

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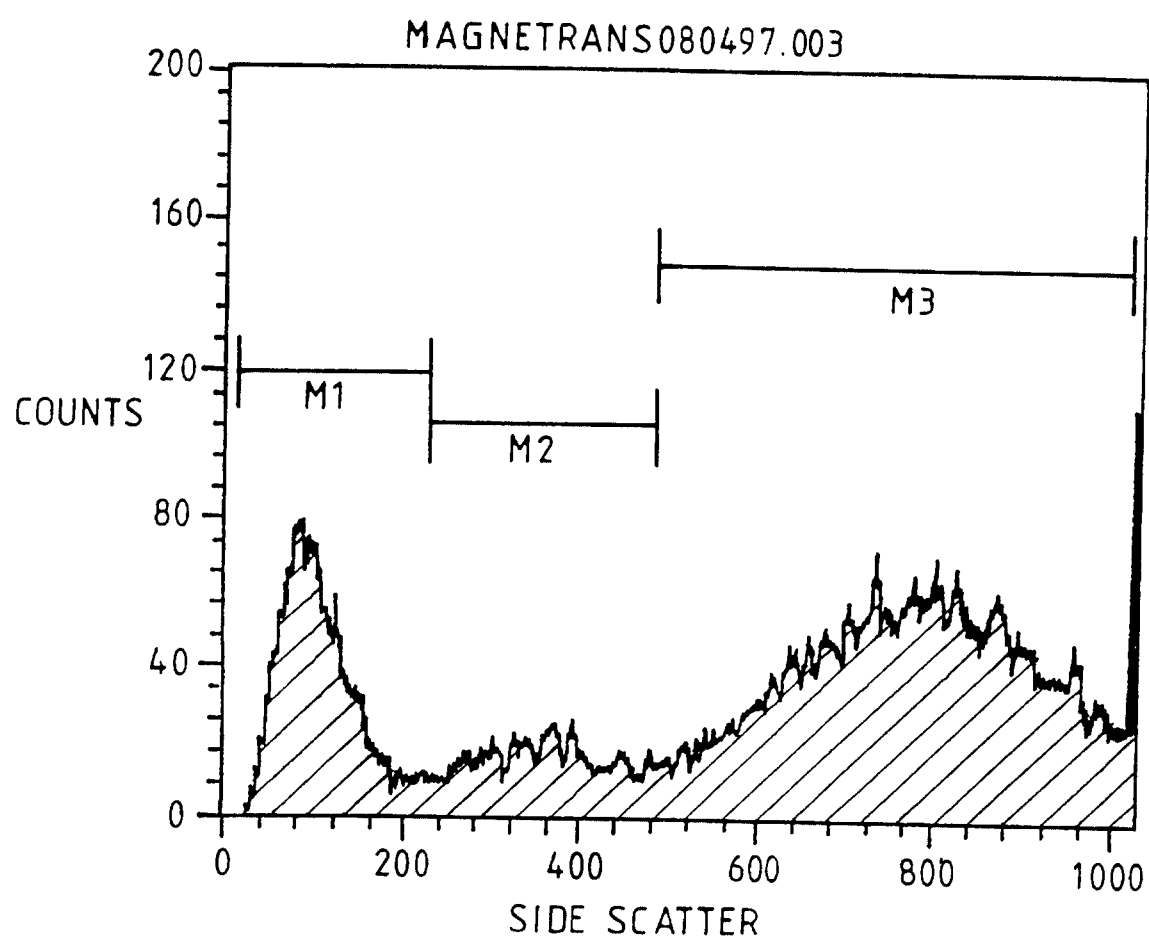


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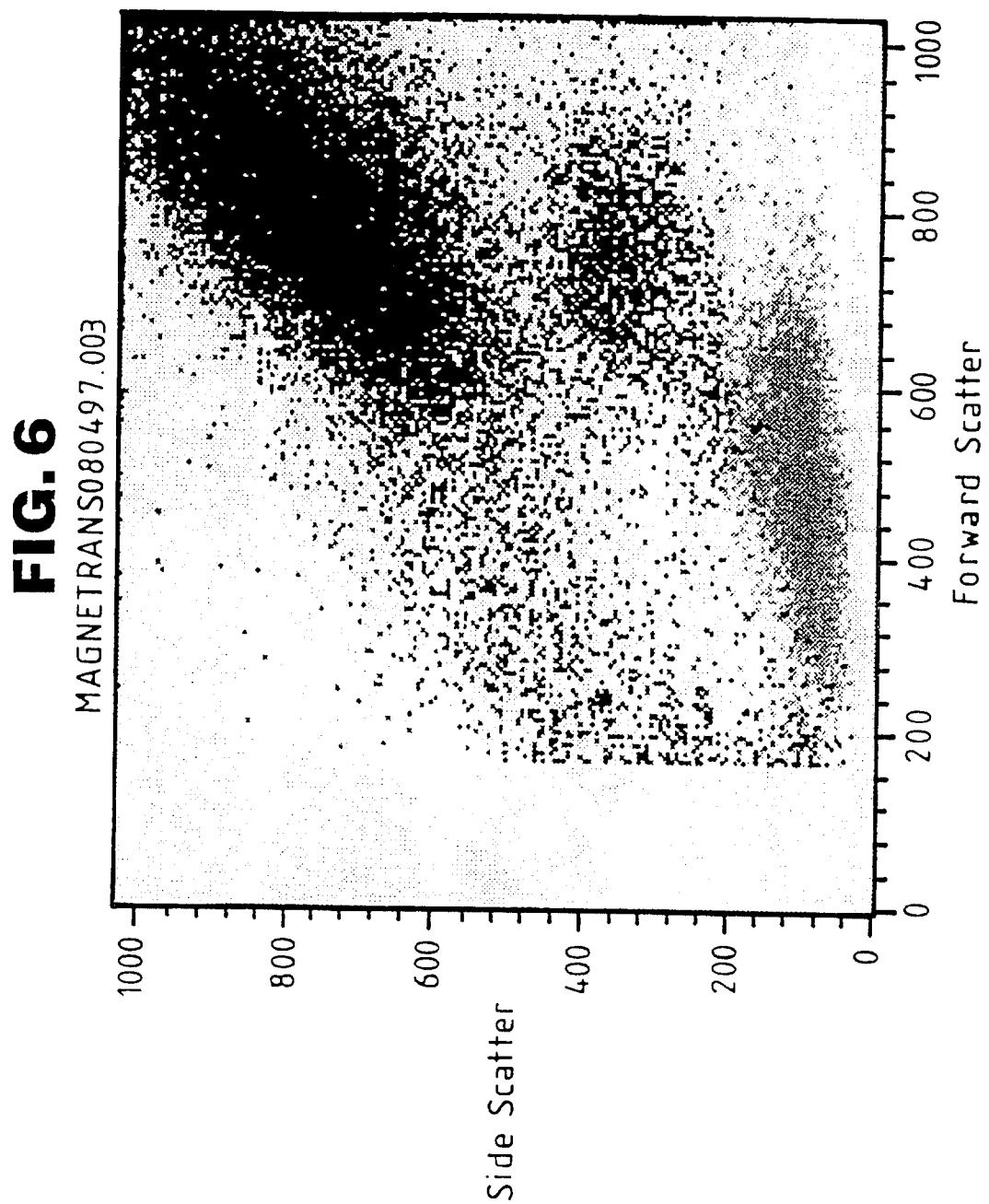


SUBSTITUTE SHEET (RULE 26)

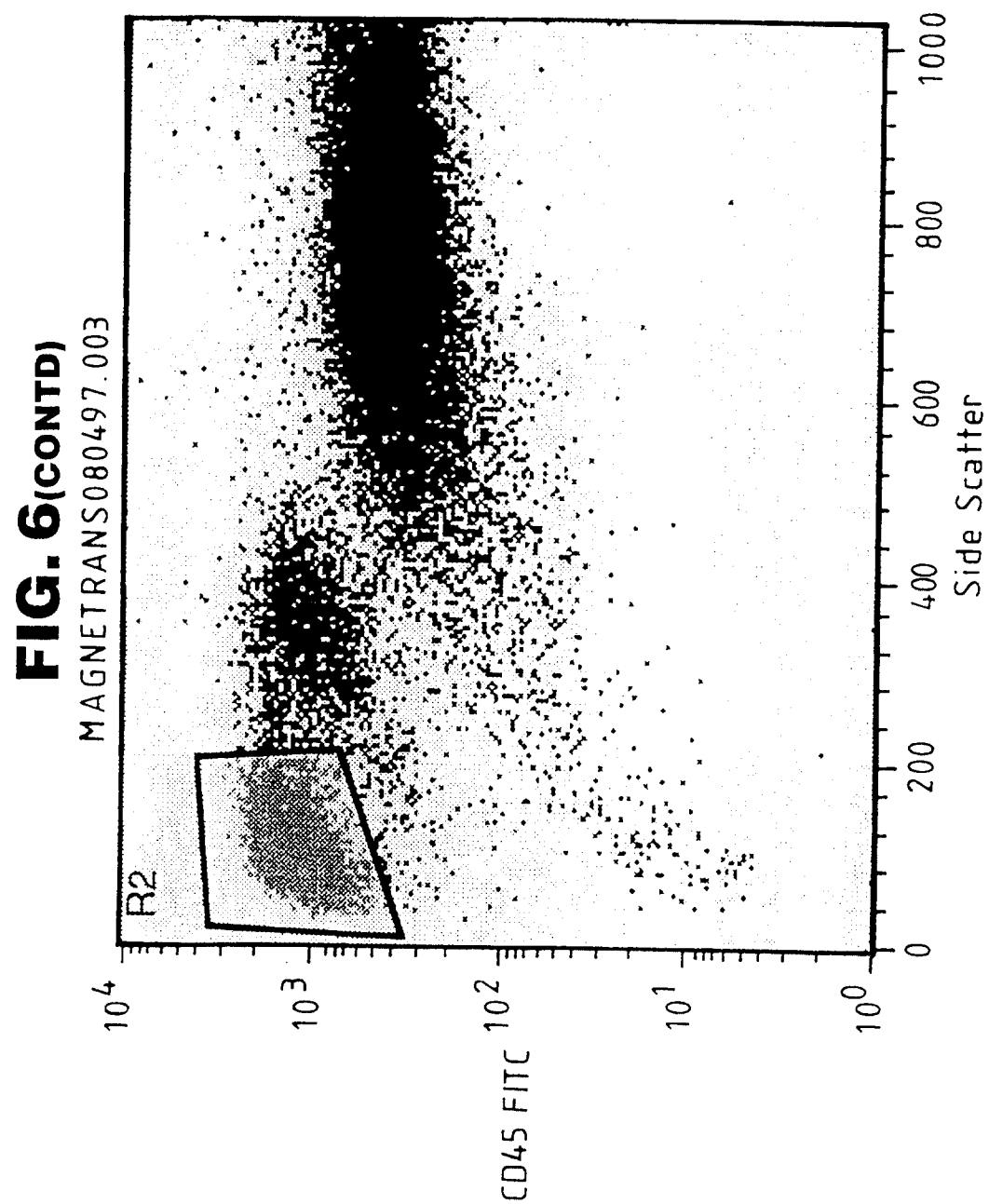
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FIG. 5(CONTD)

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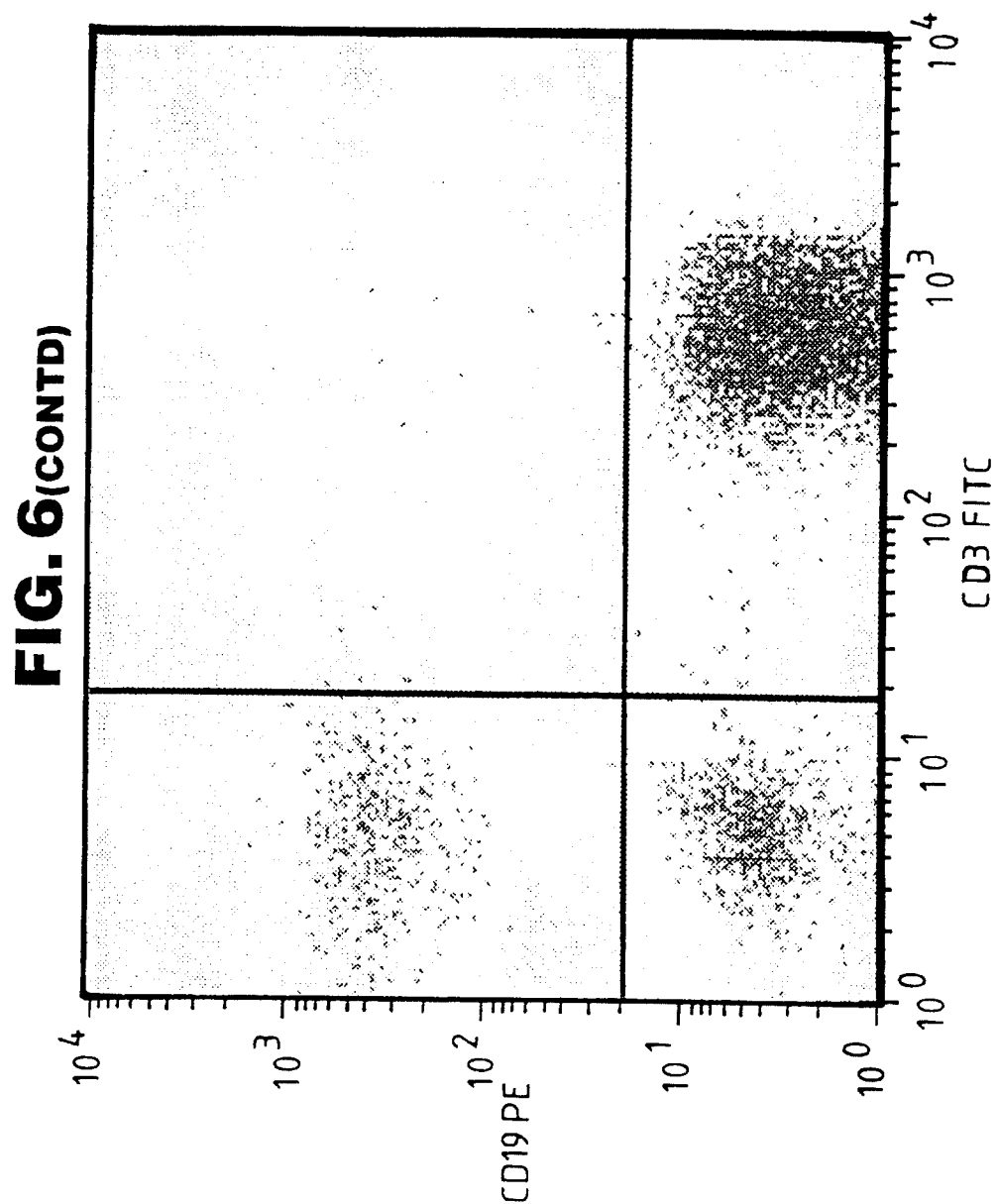


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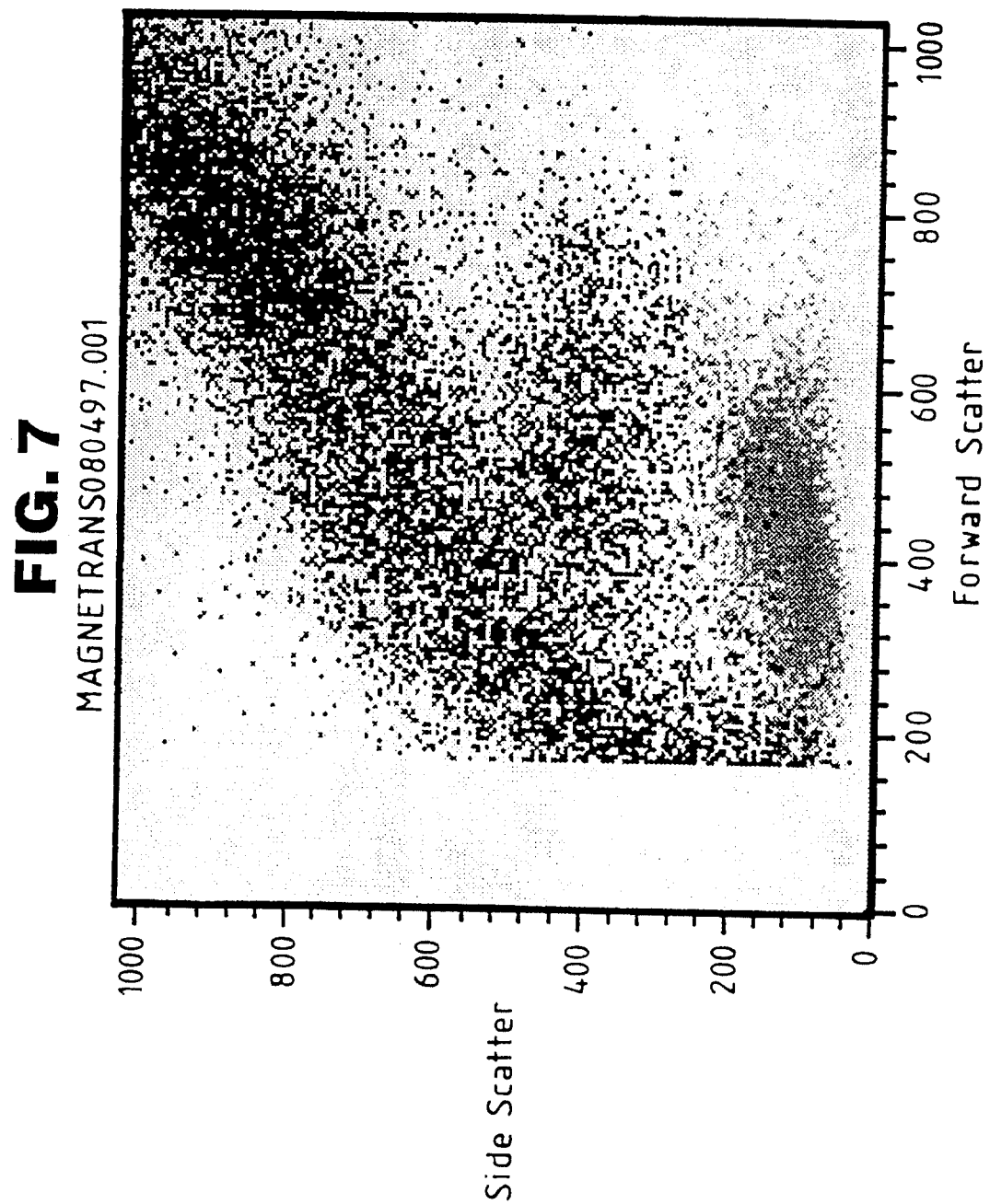


SUBSTITUTE SHEET (RULE 26)

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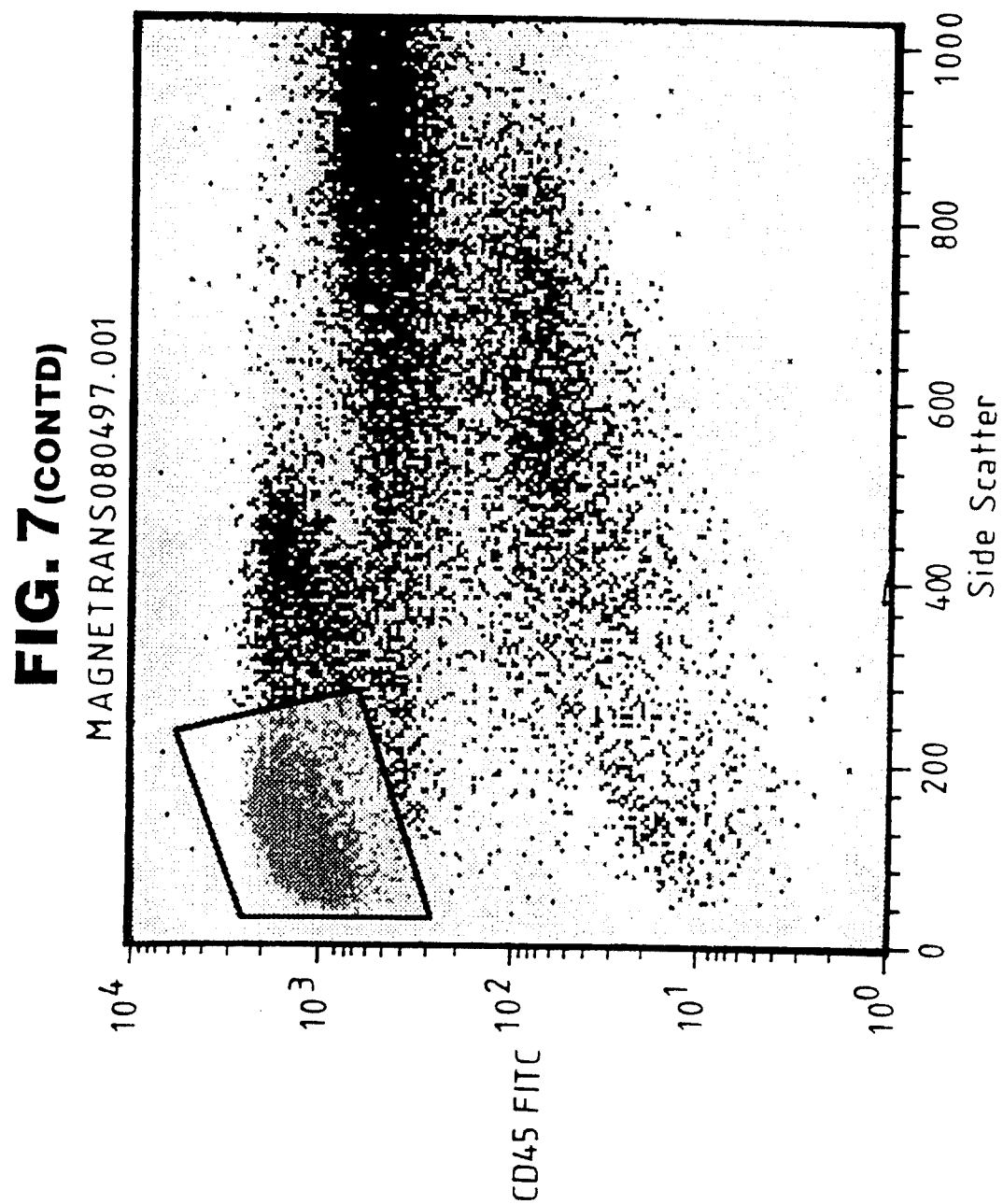


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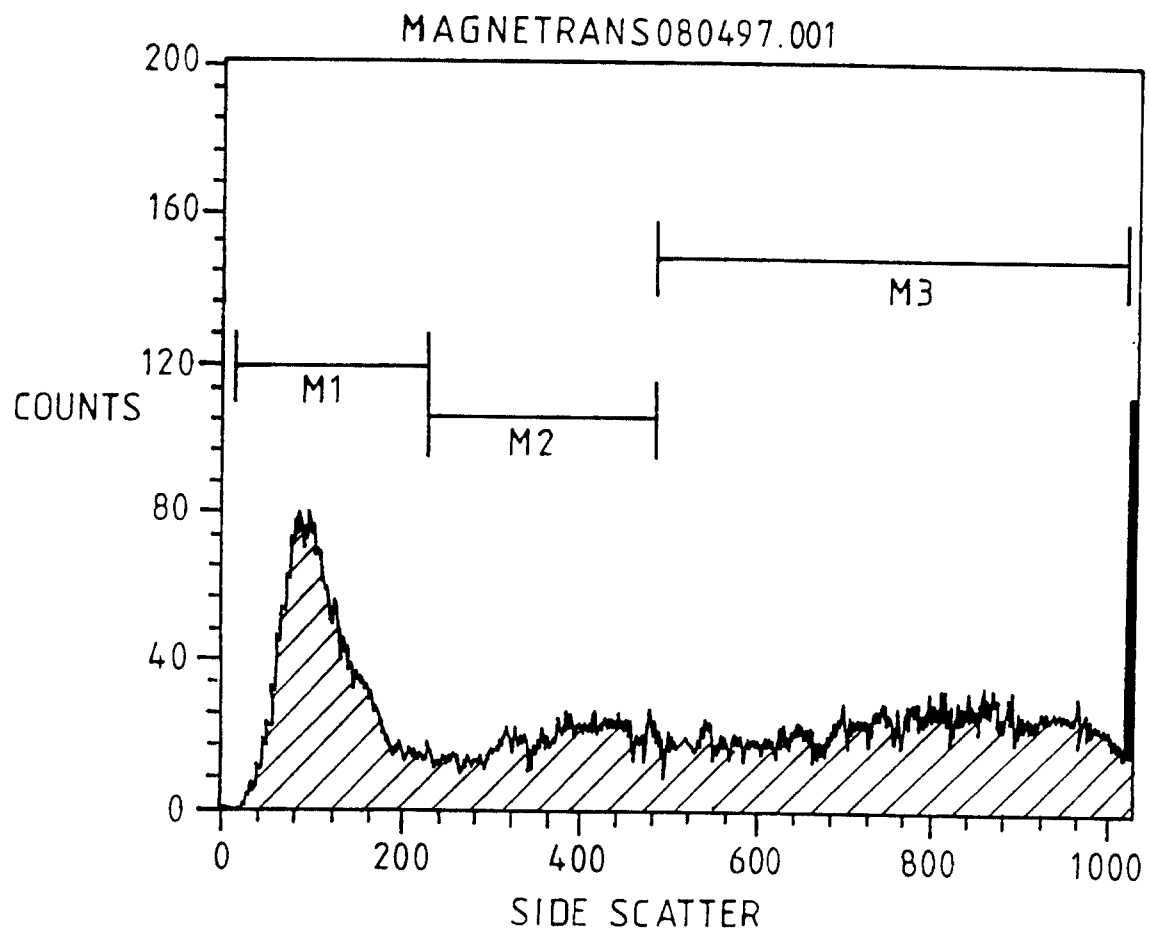
SUBSTITUTE SHEET (RULE 26)

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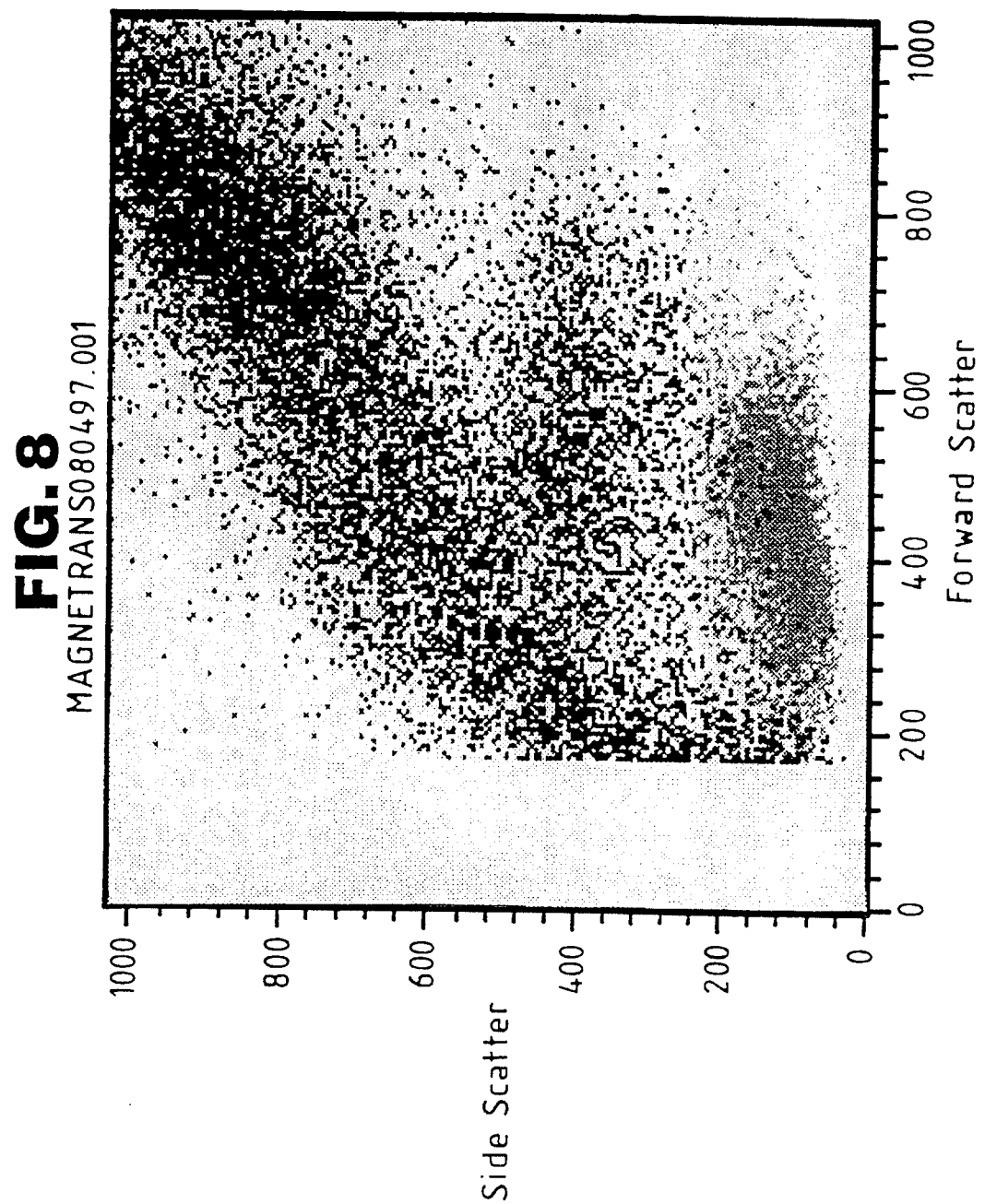
SUBSTITUTE SHEET (RULE 26)

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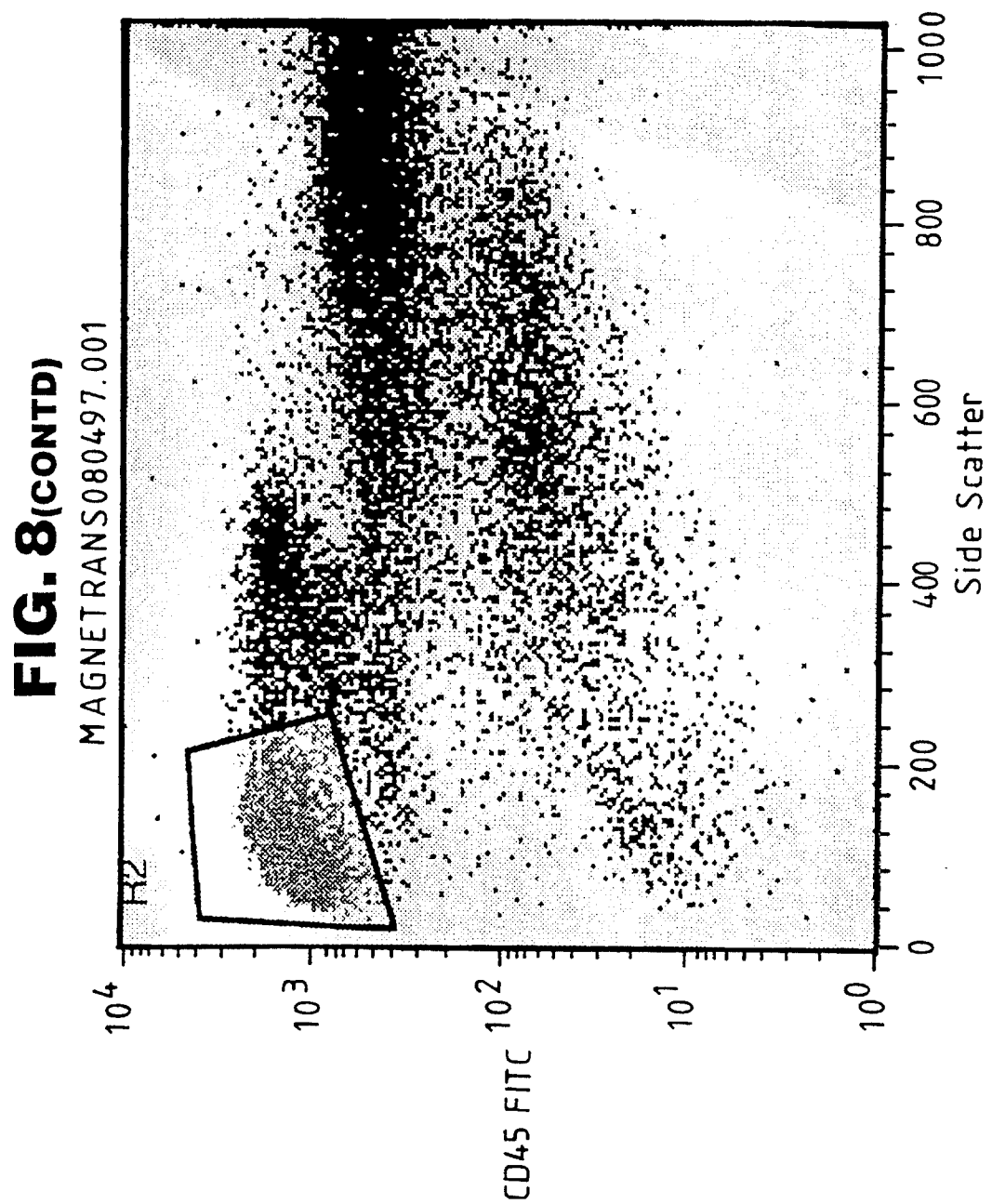
FIG. 7(Contd)

SUBSTITUTE SHEET (RULE 26)

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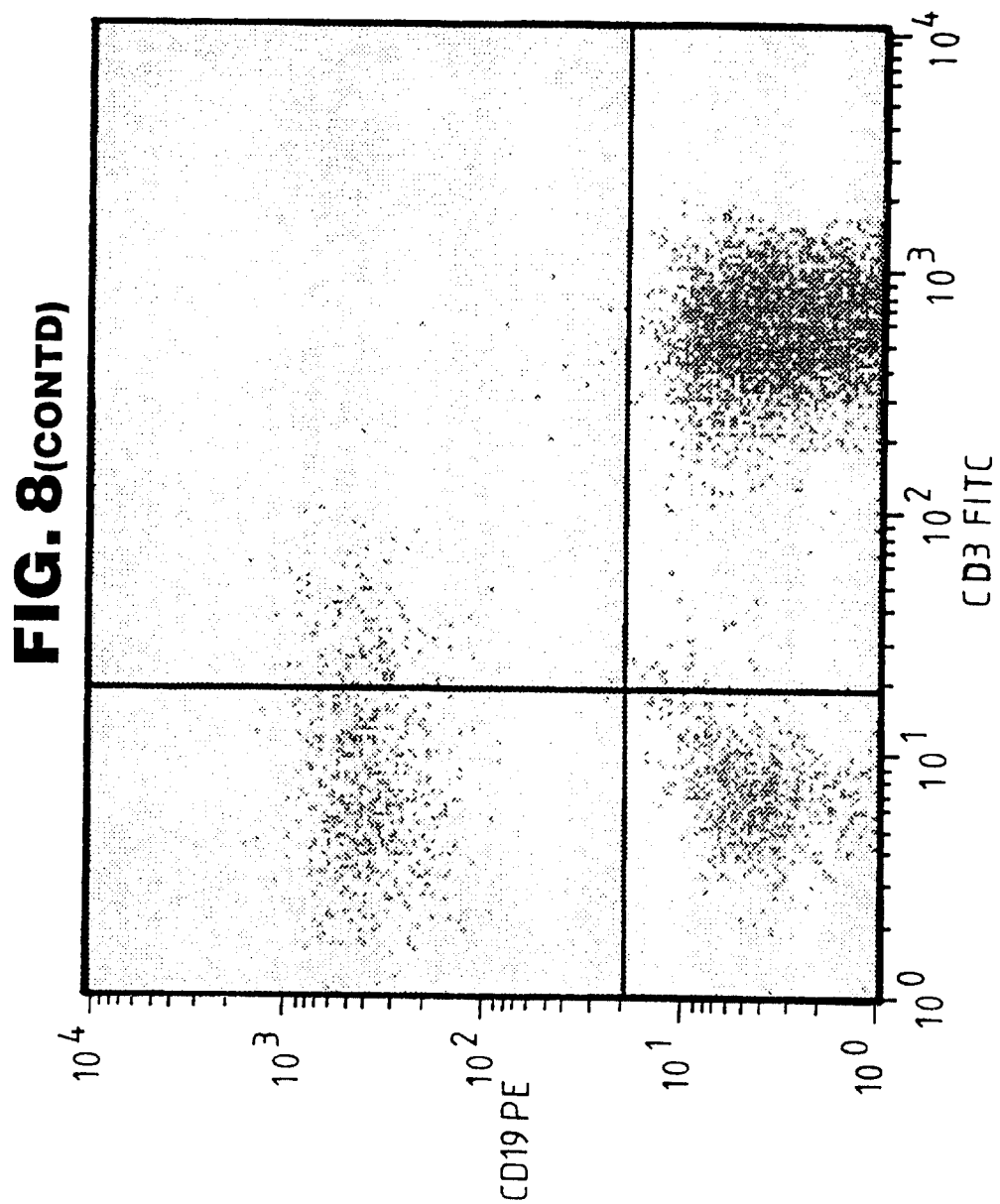


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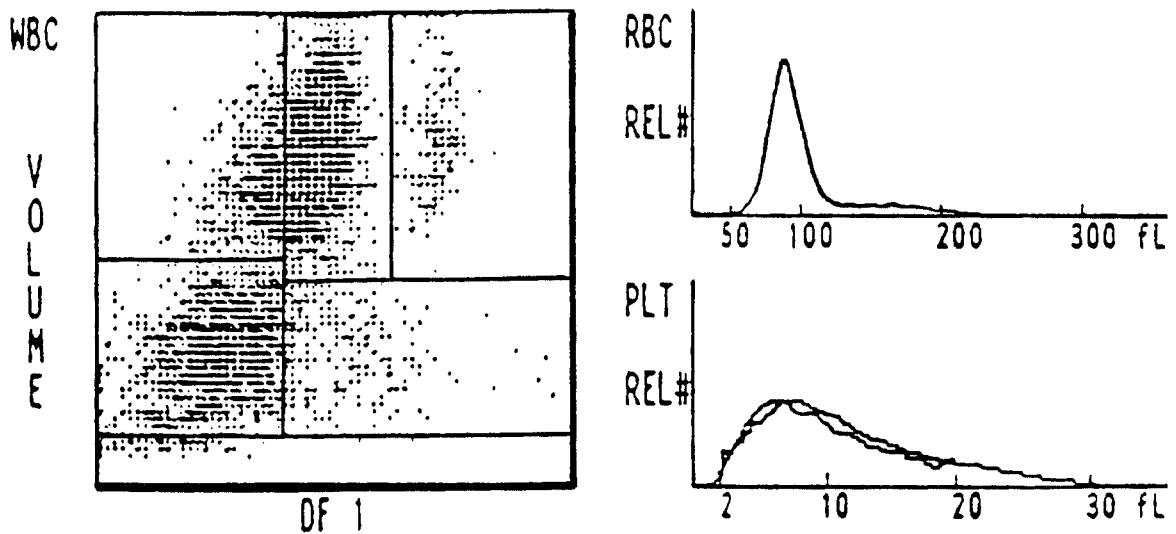
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FIG. 9

Full Blood Count profile of a stabilised specimen 3 days post venepuncture.
(Coulter STKS analyser profile)

04/07/97 13:30:12
BET



ID# 1	997	WBC	7.5	RBC	4.77
ID# 2			%	HGB	14.3
Sequence #		NE	63.0	HCT	0.430
		LY	24.2	MCV	90.1
DATE:	04/07/97	MO	9.6	MCH	30.1
TIME:	13:30:05	EO	2.5	MCHC	33.4
cassette	S	BA	0.7	RDW	12.9

Normal WBC Pop
Normal RBC Pop
Abnormal PLT Pop

PLT 167
MPV 12.0 H
PCT 0.201
PDW 18.5

SUSPECT FLAGS:

-----WBC-----RBC-----PLT-----

DEFINITIVE FLAGS:

Large Platelets

SUBSTITUTE SHEET (RULE 26)

FIG. 10**TABLE 1**

Absolute values for White Cell differential over a 5 day period.

Results expressed as $\times 10^9/l$

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	DAY 0	DAY 3	DAY 4	DAY 5
Granulocytes	4.8	4.7	4.6	5.0
Lymphocytes	1.7	1.8	1.8	1.8
Monocytes	0.7	0.7	0.9	0.8
Eosinophils	0.2	0.2	0.3	0.3

TABLE 2

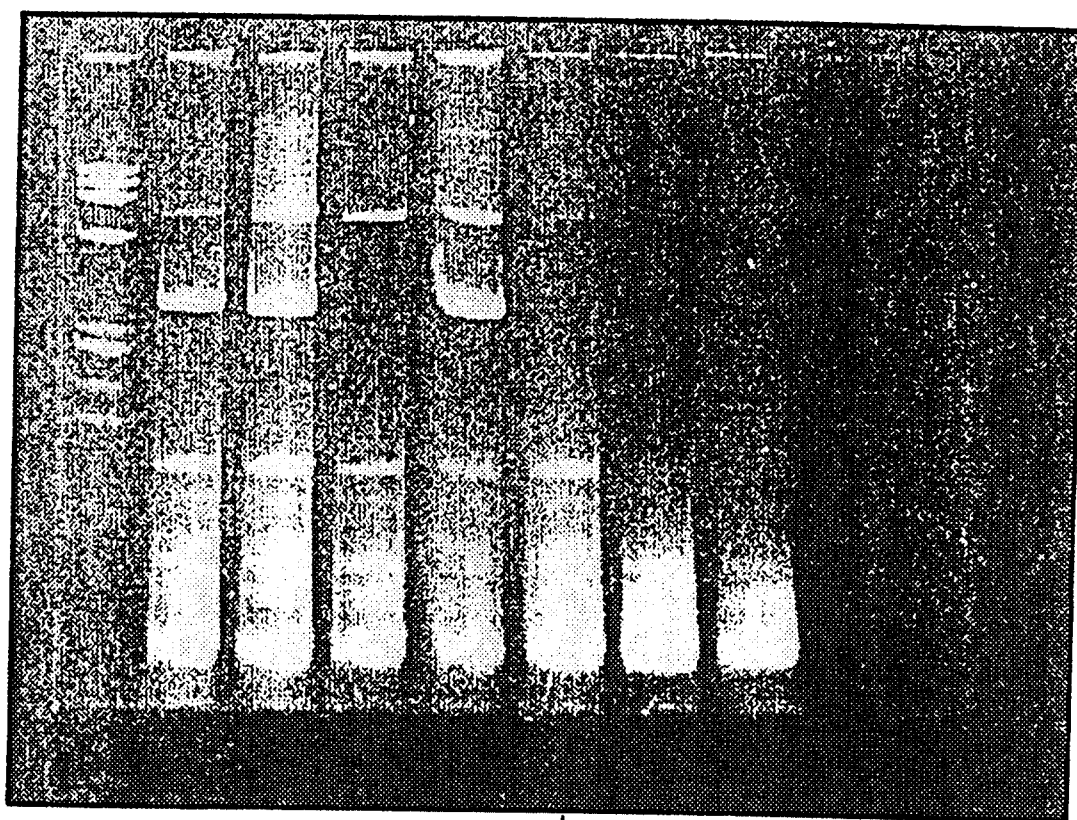
Percentage values for White Cell differential over a 5 day period.

	DAY 0	DAY 3	DAY 4	DAY 5
Granulocytes	66.1	63.0	60.7	63.3
Lymphocytes	22.4	24.2	24.1	23.4
Monocytes	8.8	9.6	11.7	9.5
Eosinophils	2.6	2.5	3.5	3.8

FIG. 10(Contd)

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FIG. 11



↑
C5