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(54) Title of the Invention: **Multiparametric discovery and optimization platform**
Abstract Title: **Multiparametric discovery and optimization platform**

(57) Provided herein are systems and methods for screening desirable biological variants using a high-throughput integrated system. The integrated system may be configured to input a plurality of parameters from functional studies of biological variants under applied conditions, in conjunction with integrated libraries of biological variants, and filter the inputs to produce desirable biological variants based on an input performance requirement. The system may output optimized strains, molecules, or novel molecules expected to have a desirable functional characteristic. Accordingly, the methods and systems disclosed herein enable multi-parametric studies of biological diversity and conditional diversity in systems biology.

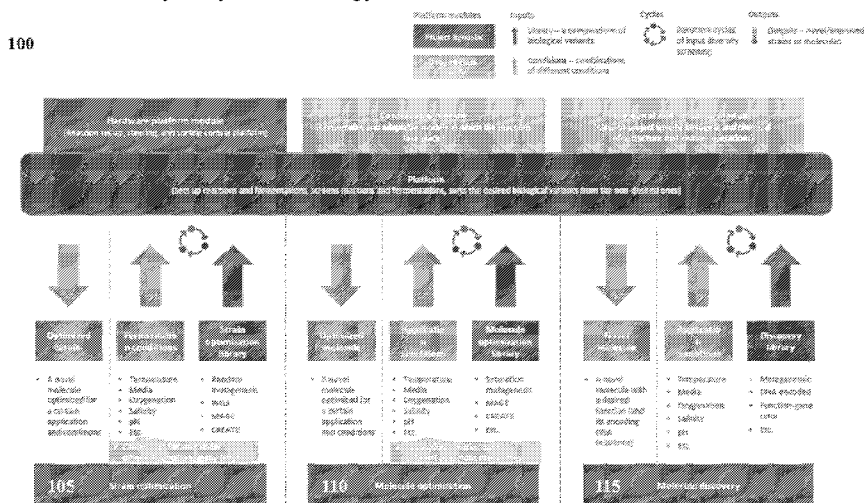


FIG. 1