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[IE/US]; 3857 25th Street, San Francisco, CA 94114 (US).

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(74) Agent: FULLER, Michael, L.; Knobbe Martens Olson & Bear LLP, 2040 Main Street, 14th Floor, Irvine, CA 92614 (US).

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(71) Applicant (for all designated States except US): THE REGENTS OF THE UNIVERSITY OF CALIFORNIA [US/US]; 1111 Franklin Street, 12th Floor, Oakland, CA 94607-5200 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): ANDERSEN, Gary, L. [US/US]; 780 Keeler Avenue, Berkeley, CA 94708 (US). DESANTIS, Todd, Z. [US/US]; 626 Salem Court, Livermore, CA 94551 (US). BRODIE, Eoin

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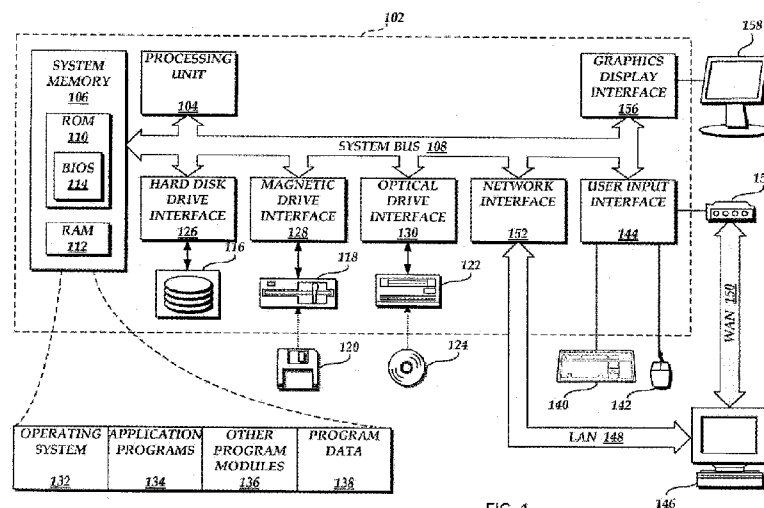


FIG. 1

(57) Abstract: The present invention discloses methods and systems for designing and using organism-specific and/or operational taxon unit (OTU)-specific probes. The methods and systems allow for detecting, identifying and quantitating a plurality of biomolecules or microorganisms in a sample based on the hybridization or binding of target molecules in the sample with the probes. Some embodiments provide methods of selecting an oligonucleotide probe specific for a node on a clustering tree. Other embodiments provide methods of selecting organism-specific or OTU-specific oligonucleotide probes for use in accurately detecting a plurality of organisms in a sample with high confidence. Some embodiments provide methods and systems to detect the presence of a rare OTU in a sample.

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