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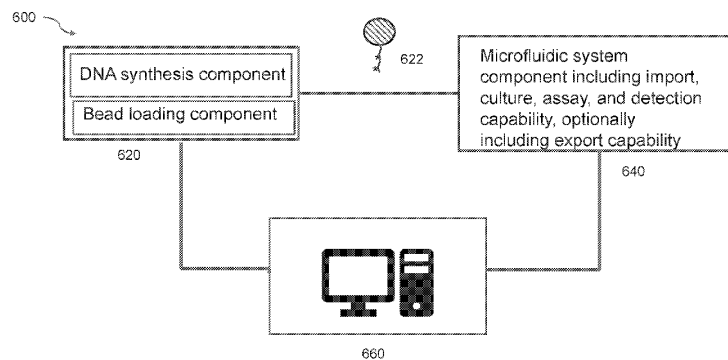


FIG. 6

(57) Abstract: Systems, methods, and kits therefor, enabling rapid protein evolution are described herein. A system useful in the methods described herein include a DNA synthesis component; a microfluidic system including a microfluidic device having a microfluidic channel and sequestration pens; and a computing component, which is configured to analyze assay results and, based upon the analysis, design improved DNA sequences for iterative protein evolution. The microfluidic system is configured to permit correlation of DNA sequence on a bead to its location within the microfluidic device, permit cell free protein expression of a DNA sequence captured to a bead, and to permit assay of the protein so produced.

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