

Sequence Independent and Ordered Nucleic Acid Assembly

Tech ID: 25453 / UC Case 2016-004-0

BACKGROUND

Currently DNA fragments are assembled from smaller oligonucleotides that contain overlapping DNA sequences. After overlapping sequences are annealed, each oligo will act as primer for polymerization, eventually fusing the two fragments together. This method relies on unique overlapping sequences that are favorable to anneal at a specific temperature. This strategy becomes problematic when you try to assemble more than two fragments, when the uniqueness of annealing sequences, the correct order of fragments annealing and optimal temperature for all the annealing reactions are major concerns. On the other hand, annealing only two fragments at a time is time consuming and low in scalability. There is a great need for a cost-effective and accurate approach.

TECHNOLOGY DESCRIPTION

Building from the concept in a previous technology developed by the same researchers at UC San Diego (UCSD Case # 2015-195), this newly disclosed technology involves fewer steps. The reaction can be performed at higher temperature and does not require any DNA hybridization. In addition, this technology does not require prescreening to make sure the DNA to be assembled will incorrectly hybridize to the solid phase. The chemistry is "solid phase" and assembly can be achieved "on chip" with minor modifications using off the shelf technologies. This strategy uses fewer enzymes than the technology described in UCSD Case 2015-195 and therefore, can be more scalable and cost-effective.

APPLICATIONS

This technology has the potential to be developed into several possible commercial products: (1) A personal gene printer, (2) Consumable reagents for gene synthesis, and (3) A large scale gene synthesis platform, and others.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20180202072	07/19/2018	2016-004
Patent Cooperation Treaty	Published Application	2017015348	01/26/2017	2016-004

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OTHER INFORMATION

KEYWORDS

nucleic acid, DNA fragments,
assembly

CATEGORIZED AS

- **Biotechnology**
 - Bioinformatics
- **Medical**
 - Research Tools
- **Research Tools**
 - Nucleic Acids/DNA/RNA

RELATED CASES

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