

TECHNOLOGY/BUSINESS OPPORTUNITY

A METHOD TO SYNTHESIZE LONG DNA SEQUENCES

Opportunity

Lawrence Livermore National Laboratory (LLNL), operated by the Lawrence Livermore National Security (LLNS), LLC under contract no. DE-AC52-07NA27344 (Contract 44) with the U.S. Department of Energy (DOE), is offering the opportunity to secure a license to exercise patent rights for commercializing its method to synthesize long DNA sequences technology.

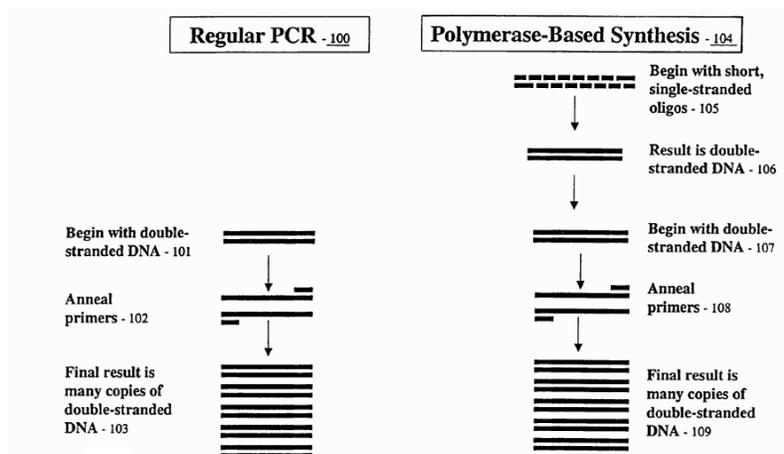
Background

The established methods for chemical synthesis of DNA work well for shorter oligonucleotides, but synthesizing DNA strands longer than one kilobase is expensive, low yield, and is prone to error. A hybrid approach using synthetic oligos and conventional PCR can be used for the synthesis of longer DNA.

Description

LLNL scientists have developed a method to synthesize long DNA sequences of varying length starting from short oligos. Synthetic oligos are generated using bioinformatics tools by overlapping multiple small segments, such as 4-mers or 6-mers, derived from both strands of the source DNA strand. DNA polymerases fill the gaps between these short n-mers to create the new, longer DNA strand. This process can be repeated multiple times using same or different length n-mers until the DNA strand of user specific length is synthesized within the microwell where this reaction takes place. An alternative version of this method, which separates the groups of different length n-mers spatially into distinct wells prior to the polymerase reaction occurring, is to separate them temporally. By sequentially adding the n-mers to the reaction mix, this alternative method may increase the probability the n-mers will bind in the correct order to create the desired long DNA strand.

Scheme



Advantages

- Synthesis of long DNA strands with lower cost and higher yield
- Spatial or temporal separation of added oligos as well as the ability to start with oligos of odd or even-length allows for flexibility in performing the method

Potential Applications

- Synthesis of longer DNA strands
- Manual introduction of specific n-mer component sequences into desired long DNA strand

Development

LLNL currently holds patents [8,470,537](#) and [7,871,799](#) for “Sequential addition of short DNA oligos in DNA-polymerase-based synthesis reactions” (LLNL internal case # IL-11191).

Please visit the IPO website at <https://ipo.llnl.gov/resources> for more information on working with LLNL and the industrial partnering and technology transfer process.

Note: **THIS IS NOT A PROCUREMENT**. Companies interested in commercializing method to synthesize long DNA sequences should provide a written statement of interest, which includes the following:

1. Company Name and address.
2. The name, address, and telephone number of a point of contact.
3. A description of corporate expertise and facilities relevant to commercializing this technology.

Written responses should be directed to:

Lawrence Livermore National Laboratory

Innovation and Partnerships Office

P.O. Box 808, L-795

Livermore, CA 94551-0808

Attention: FBO 434-19

Please provide your written statement within thirty (30) days from the date this announcement is published to ensure consideration of your interest in commercializing LLNL's method to synthesize long DNA sequences technology.