

EXECUTIVE SUMMARY: *(State in layman's terms the application's broad, long-term objectives and specific aims, making reference to the potential public benefits of the project for California.)*

One of the greatest challenges of biotechnology is establishing the base sequence of individual molecules of DNA without the need for PCR amplification or other modification of the molecule. The Sanger method has proven extremely powerful and has resulted in the recent sequencing of the human genome in 2001. This monumental effort was the result of a large group of scientists working on resolving the same sequence. Here, we propose a technique for reading the base sequence of a single DNA molecule without the need for PCR amplification or other modifications of the molecule. This promises to be an enabling technology for fast and cost-effective sequencing and resulting genetic screening.

Results of the proposed research are expected to advance the state of the art of DNA sequencing, possibly improving medical services that can be provided to the general population such as rapid and cost-effective genetic screening. Making genetic screening as a diagnostic technique more cost effective will make it more accessible to the general population. Increased use of this diagnostic technique in preventive healthcare will lead to an increase in early detection of genetic diseases such as certain forms of cancer and therefore reduce the cost of treatment.