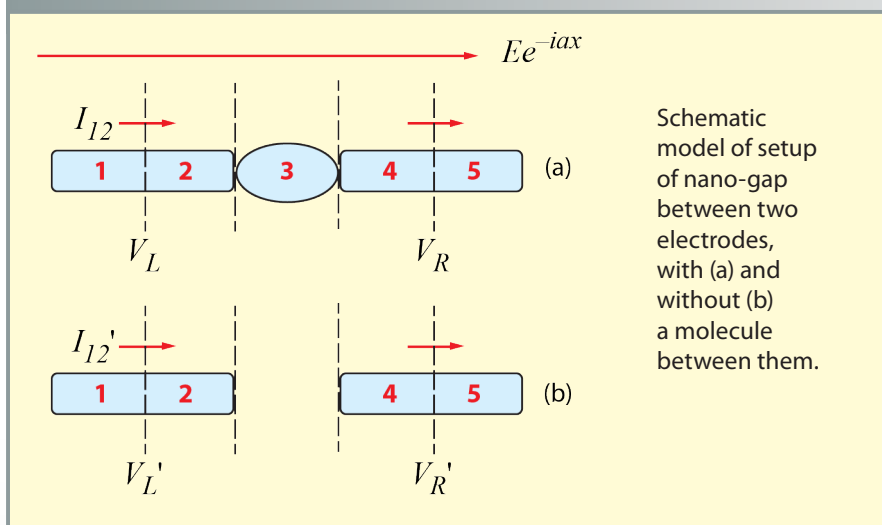


Low-cost, Rapid DNA Sequencing Technique

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Technology Summary

A faster, less expensive, more accurate and more reliable method for DNA sequencing has been developed at ORNL. The method takes a high-frequency measurement on a single strand of DNA or RNA deposited on a substrate using an alternating current (AC). The data is used as a criterion to identify the genetic sequence.

Sequencing DNA is crucial for future breakthroughs in biological and biomedical research. Until now, DNA sequencing for medical applications has been restricted by the high cost of the work. The technology includes one electrode located on the dielectric surface of a substrate and a second that is separated from the first by a gap enabling a nucleic acid strand to pass through. An AC capacitance measurement assembly is connected to the first and second electrodes and configured to generate measurement data. The nucleic acid strand transport mechanism located on the dielectric surface of the substrate is also configured to generate measurement data.

Advantages

- Low-cost and rapid DNA sequencing
- Increased accuracy and reliability
- Could be combined with ORNL's Nanoscopic Electrode Molecular Probes, US Patent Application 12/321,823 if nanoscale electrodes for DNA sequencing is required

Potential Applications

- Medical and pharmaceutical industries
- Basic science research

Patent

Xiaoguang Zhang and Jun-qiang Lu, *Nucleotide Capacitance Measurement for Low Cost DNA Sequencing*, U.S. Patent Application 12/848,407, filed August 2, 2010.

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