

Novel Nano-Scale Biosensor for Rapid Low Cost Genomic Sequencing

Description:



This technology features the development and application of a novel nanoscale biosensor with the capability to detect and discriminate any variation in charge and dielectric conditions of the nearby space spanning from the electrode surface to a few nanometers. The primary application of this technology is aimed at forming to basis for a third generation nanopore genomic sequencing device. A device like this provides rapid, low cost tool to enable personalized medicine. The included chart shows a comparison of the potential capabilities of this approach versus other current and emerging genomic sequencing technologies.

**bp = base pairs (DNA)*

Third-generation (3G) nanopore sequencing technologies					
Technological Platform	Cost (<\$1000)	Speed (<60 min)	Accuracy (>99.99999%)	Resolution (SNPs, methylation)	Read length (>1000 bp)
Biological	✓	✗	✓	✗	✓
Ion blockade	✓	✓	✗	✓	✓
Tunneling	✓	✗	✗	✗	✓
Photonic	✗	✗	✓	✗	✓
Capacitive	✓	✗	✗	✗	✓
Our Solution	✓	✓	✓	✓	✓

Applications:

- Nanopore channel devices for DNA sequencing
- Detection of biological binding or monitoring
- Monitoring of intramembrane events
- Chemical and biological detection for biomedical purposes, environmental purposes, food safety, homeland security, etc.

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