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## Predictive, Preventive and Personalized Medicine & Molecular Diagnostics

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### Nanopore sequencing for next generation personalized genomic medicine

 $\mathbf{N}$  anotechnology is at the forefront of precision medicine for diagnostics and targeted medicine. Sequencing the genome allows the understanding of the genetic make-up of an individual and to predict the susceptibility to a disease thus paving the way for therapeutics and personalized medicine. Nanopore technology is a fourth generation sequencing technology that offers a single molecule sequencing platform which can be highly scalable for high throughput DNA sequencing. This technology is a powerful tool that can revolutionize personalized genomic medicine since it's fast, cost-effective, requires less amount of sample material and no amplification steps. We recently reported a nanopore-based sequencing by synthesis technology wherein we show that a polymerase could be coupled to the  $\alpha$ -hemolysin pore embedded in a lipid bilayer formed on an electrode array. Using this method, we demonstrate that DNA sequencing could be achieved at a single molecule level using tagged nucleotides that get captured in the pore yielding signature current blockade events. This nanopore platform can be used as a foundation for a low-cost, single molecule, electronic DNA-sequencing platform

#### Biography

Sukanya Punthambaker is currently a Post-doctoral Fellow at Laboratory of Dr. George M. Church in the Department of Genetics, Harvard Medical School. She received her Bachelor's degree in Microbiology at Bangalore University, India; Master's degree in Biotechnology at University of Mysore, India and; PhD in Molecular Biology from the University of Michigan, USA. For her PhD, she studied the structure function relationship of a class of ligand gated ion channels called P2X receptors under the guidance of Dr. Richard Hume. Her current Post-doctoral study involves research work on cutting edge next generation single-molecule and spatial DNA sequencing technologies, such as nanopore sequencing and fluorescent *in situ* sequencing. She received several awards including in the Department of Biotechnology - Junior Research Fellowship, India for the outstanding graduate student instructor award and the Okkelberg Award to an exceptional senior graduate student both from the University of Michigan. She has authored impactful publications in reputed peer reviewed journals.

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