What’s the next frontier of genome sequencing?

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Genomics has recently celebrated reaching the $1,000 genome milestone, making affordable DNA sequencing a reality. With this goal successfully completed, the next goal of the sequencing revolution can be sequencing sensors — miniaturized sequencing devices that are manufactured for real-time applications and deployed in large quantities at low costs. Here, we envision applications that will benefit from moving the sequencers to the samples in a range of domains. Then, we outline the critical barriers that need to be addressed in order to reach the goal of ubiquitous sequencing sensors.

For decades, an affordable sequencing platform — the $1,000 genome — has been the main focus. While price was under strong selective pressure, the community has largely accepted sequencing devices in any shape and size. Examples of such devices include the now obsolete Heliscope by Helicos Biosciences, which contained a >100 kg granite slab to stabilize the sequencer and the 860 kg Pacific Biosciences’ RSII instrument, with its large footprint. In stark contrast, the last year has witnessed the emergence of small-footprint sequencers with the successful early access program of the handheld Oxford Nanopore MinION and an ongoing development of relatively small sequencers by other companies such as Genapsys.

With these exciting new developments, the next phase of the sequencing revolution is the emergence of DNA sequencing sensors. Different from massive sequencing platforms such as the Illumina X Ten and Pacific Biosciences RSII, sequencing sensors will be extremely miniaturized devices that include automatic sample preparation with the aim of real-time sequencing in the field.

Read full, original post: A vision for ubiquitous sequencing