Six Years After Acquisition, Roche Quietly Shutters 454

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By Bio-IT World Staff

October 16, 2013 | This month, Roche began the process of closing its wholly-owned subsidiary 454 Life Sciences, a once-dominant player in next-generation sequencing, and laying off the company's 130 employees. Manufacturing of 454 sequencers will continue through 2015, and the sequencers will continue to be serviced through mid-2016; the layoffs will be phased over this period. This announcement follows a series of downsizing measures from Roche in the area of genetic sequencing over the past year.

At the time that Roche acquired 454 Life Sciences in 2007, the company seemed poised to lead a reinvigorated gene sequencing market into the age of the $1,000 genome. In a 2005 paper in *Nature*, 454 had described the successful use of a new technique of "sequencing by synthesis," synthesizing DNA fragments, separating them to be sequenced in parallel, and then virtually reconstructing the combined genome. The technique's efficacy was demonstrated by sequencing the nearly-complete genome of the bacterium *Mycoplasma genitalium,* at a fraction of the cost and time possible with the Sanger sequencing method that had been standard for a quarter of a century. 454's method was significant not only because of its initial success, but because it bypassed limitations to pushing Sanger sequencing forward, promising refinements in the future that would continue to drive the price and time constraints of sequencing downward. The same year, 454 released the first commercially available next-generation sequencer, the GS20, and began its relationship with Roche with a $60 million exclusive licensing deal. At the time, this string of achievements led 454's founder, Jonathan Rothberg, to tell Bio-IT World (http://www.bio-itworld.com/BioIT_Article.aspx?id=26992&terms=rothberg++own+words), "it's been a 25-year race, we're commercial, and we won."

In recent years, however, 454's technology has been eclipsed by other next-generation sequencers like Illumina's MiSeq and the Ion Proton by Ion Torrent, another Rothberg-founded company. Roche, meanwhile, has run into a series of walls in its aggressive attempts to regain the edge in genetic sequencing. A hostile takeover of Illumina was thwarted (http://www.bio-itworld.com/BioIT_Article.aspx?id=115228&terms=roche+illumina) in April of 2012, and this April, Roche announced (http://www.bio-itworld.com/BioIT_Article.aspx?id=125468&terms=454) that it would close its Applied Science unit, firing 170 workers (including 60 working at 454 Life Sciences), and narrow the focus of this division strictly to next-generation sequencing. Two long-term R&D projects that might have pushed Roche toward "third-generation" sequencing, using semiconductors and nanopores respectively, were discontinued as part of the reorganization.

The closing of 454 marks Roche's latest pivot toward a more limited vision of its role in the sequencing market, at least for now. The company's largest remaining foothold in the area may be its exclusive licensing deal (http://www.bio-itworld.com/BioIT_Article.aspx?id=130397) with Pacific Biosciences for forthcoming *in vitro* diagnostics products, using the SMRT sequencing system that powers PacBio's RS II Sequencer.

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