

Russell John Howard

Dr. Howard is currently CEO of Oakbio Inc., an early start-up Cleantech company he co-founded dedicated to developing products for generating electricity, cleaning water and producing valuable chemicals from the bioelectric properties of microbes. Oakbio products will incorporate discoveries and technologies at the intersection of microbiology, electrochemistry, chemical engineering and control systems.

Until Sept 2009, Dr Howard was CEO of Maxygen (NASDAQ: MAXY), where he was one of the company's founders in 1997. His departure from Maxygen in 2009 was co-incident with creation of Perseid, a joint venture spin-off company between Maxygen and Astellas Pharmaceuticals. Perseid is taking forward the protein pharmaceuticals programs and all associated technology rights in this therapeutics area developed over the last decade by Maxygen.

Maxygen's core technology, MolecularBreeding™ Directed Molecular evolution, or DNA Shuffling, was invented at Affymax, when Dr Howard was President and Scientific Director. After the purchase of Affymax by GlaxoWellcome in 1995 for its combinatorial small molecule chemistry and high throughput discovery expertise, DNA shuffling technology was incubated at Affymax and subsequently spun out of GlaxoWellcome in the new entity Maxygen. Dr Howard led Maxygen from its time of incubation in Affymax-GlaxoWellcome to 2009.

Maxygen went public at the end of 1999, raised additional capital in a secondary offering in 2000, and in the same year, acquired a private Danish protein pharmaceutical company. Maxygen maintained facilities in Redwood City, CA and Copenhagen, Denmark from 2000 until announcing closure of the Danish site and consolidation of all assets to the USA in early 2008. Maxygen garnered sufficient funds from partnering and sale of non-core assets such that it did not require financing in the public markets since 2000.

Early on it was recognized that the core technologies of Maxygen, including MolecularBreeding™ Directed Molecular evolution technologies, have multiple commercial applications. Once the decision was made in 2000 to focus on the core business of novel protein pharmaceuticals, non-core businesses were developed internally specifically for eventual sale or spin-off.

The industrials business opportunity, with emphasis on process development for pharmaceutical intermediates manufacture, and more recently also in Biofuels, was privately financed end of 2002 by creation of Codexis, where today Maxygen retains significant equity ownership.

The business opportunity for improved genes in agricultural applications, with focus on crop protection traits, was developed in the subsidiary Verdia, until its sale for \$64MM cash to Pioneer-Dupont in 2004.

Maxygen also spun out Avidia in 2003 for its focus on small protein scaffold technology, and later gained liquidity in its holding from sale of Avidia to Amgen in 2006.

In the course of growing Maxygen from 1997 to 2009, Dr Howard contributed to several rounds of company financing. Private financings of Maxygen between 1997-1999 raised \$56 MM. Maxygen's IPO raised \$110 MM (Dec., 1999) and was followed by a Secondary Public offering in March of 2000 for another \$247 MM. The spin-out of Codexis was accompanied by Private Financing. Between 1997 and 2009, >\$200MM was generated from Corporate Partnerships across diverse fields, and in the same period, >\$35 MM was generated from Government Grants.

Originally trained in biochemistry and chemistry at Melbourne University, Australia, Dr. Howard spent over 20 years as a research scientist studying infectious diseases, primarily malaria.

Before joining Maxygen, he served as the President and Scientific Director of Affymax Research Institute (Palo Alto, California, USA), an institute employing combinatorial chemistry and high throughput target screening to discover drug leads (1994-96).

Prior to joining Affymax, Dr. Howard held various research positions at DNAX Research Institute, Palo Alto, California, USA (5 years) and the National Institutes of Health, Bethesda, Maryland, USA (8 years), where he received tenure.

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Dr Howard has over 140 scientific publications, primarily on the molecular pathogenesis of human cerebral malaria and the process of antigenic variation and immune evasion by malaria parasites. These studies involved laboratory research as well as field studies in diverse regions of the tropics, with studies of humans, in primate animal models, on aspects of parasite biology, biochemistry, molecular biology and immune evasion.

Dr Howard was educated at Melbourne University, Australia (B.Sc. Chemistry & Biochemistry, 1971; B.Sc.(Hons.) Biochemistry, 1972; Ph.D. Biochemistry, 1975. He was awarded a DSc. from University of Technology Sydney in 2004 and a DSc. from University of Queensland, Brisbane, Australia in 2008.