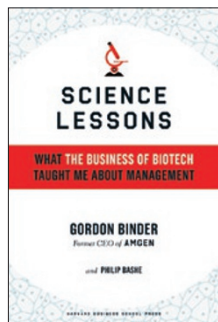


The house that George built



Science Lessons: What the Business of Biotech Taught Me About Management

by Gordon Binder & Philip Bashe

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Reviewed by John Maraganore

Building a sustainably profitable biotech company from scratch and advancing innovative medicines to patients is no easy task. The lessons from our industry's pioneers teach us that this effort requires 10–20 years from inception and somewhere from \$1–2 billion of invested capital. The “ministerial zeal” of George Rathmann, who co-founded Amgen (nee “Applied Molecular Genetics”) in 1980, drove the beginnings of one of these remarkable stories, now told as a primer on the business of science in *Science Lessons*. Where Genentech prevailed through the best science and its landmark alliance with Roche and where Biogen Idec succeeded more slowly with the solid foundation of a coveted royalty stream, Amgen's story is defined by the discoveries of two blockbuster products—recombinant versions of erythropoietin (EPO) and granulocyte colony-stimulating factor (G-CSF)—that were commercialized nine and eleven years, respectively, from company founding. In other words—big products, real fast.

In 1982 when Rathmann was sowing the seeds of Amgen's beginnings, coauthor Gordon Binder, on the sound advice of his wife Adele who posited that, “maybe [Amgen] will turn into something really big,” joined as the company's first CFO, helping it go public a year later. On the eve of launching EPO and for slightly more than a decade thereafter, Binder succeeded Rathmann as CEO and led Amgen's creation of billions of dollars of value in product revenues and market capitalization. From this purview, *Science Lessons* provides a rare perspective on leadership in building a great company, with important insights on people and culture, product development and clinical trials, and fund raising and partnerships.

Binder notes in the book's introduction that Amgen's “secret weapon” was its eight values, which included being science-based, competing intensely, working in teams, trusting one another and being ethical; the company's foundations for building a winning team and culture are thus defined early in the story. However, the key lessons on this topic wait until the last chapters of the book. Here, insights regarding hiring talented people and creating flexibility in career development speak to a culture of risk taking and empowerment. The story of Dennis Fenton's migration from lab scientist to head of marketing and sales exemplifies the critical need for the development of people in a successful biotech. Further, the perspective on the importance of employee independence

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regarding self-initiative and self-management rings true to a science-based culture. Nevertheless, it was surprising to see no discussion on the importance of product champions and the role of scientific publications, key success elements found in many innovation-based biotech companies.

Amgen is widely recognized for its unprecedented speed in advancing two biotech blockbusters to market. The story of Fu-Kuen Lin's cloning of EPO from amino acid sequence analysis of minuscule quantities of protein purified in collaboration with Gene Goldwasser's laboratory at the University of Chicago is a legendary story of heroism in our industry. Binder's account highlights the lesser-known elements of this story, including the personal engagement of then-CEO Rathmann in courting Goldwasser away from the competition (as a graduate student at the time, one floor below the Goldwasser lab, I had a front-row view to the courtship), speaking to the need for biotech CEOs to be deeply involved with both science and its interface with the Academy. The book also includes the near-death experience of Amgen's EPO project by the hand of management, and the story of the “Simi Valley Hostages” and the round-the-clock effort behind amassing the company's first new drug application. Rounding out Binder's account of Amgen's product development experiences was the story of the hard-fought EPO patent battle with Genetics Institute that defined one company's transition to the biotech pantheon and the other company's loss of independence. Of course, *Science Lessons* also recounts the “nuclear winter” in research productivity that followed the successes of EPO and G-CSF, only addressed by second-generation versions of each blockbuster, that have defined some of Amgen's growth challenges even today.

Binder's story also describes important lessons on funding and partnerships, two critical elements in building a successful biotech company. This begins with a vivid account of Amgen's successful 1983 initial public offering that highlights the critical importance of timing an offering with an all-too-elusive window of when the public markets will be the most interested and receptive. Later comes a briefer account of the product-based R&D limited partnerships that allowed Amgen to fund much of the costs of EPO and G-CSF development and commercialization in a manner that was dilution-friendly while preserving product ownership. Of course, Amgen was always a believer in co-founder Bill Bowes' wisdom that companies die from lack of money, not dilution. Ironically, this has not been the case in the history of biotech up until perhaps today. Regarding partnerships, the book tells the story of Amgen's dogged search for a pharma partner for EPO and the industry's lackluster interest. Binder's tutorial points to both the critical need for biotech-pharma partnerships in advancing products to market, but also the pitfalls related to divergence of business interests that are all too common in the industry.

Across the spectrum of culture, product development and business strategy, *Science Lessons* provides a rare perspective on building a successful biotech company and should be required reading for budding bioentrepreneurs. Binder also provides others—physicians, payors, regulators, legislators and investors, to name a few—a candid view on the many real hurdles of translating today's biomedical discoveries into new medicines.