

4.5 Science Expertise and Culture at the Top

Another important cultural element in the pharmaceutical industry is the expertise of its top management. In the early days, pharmaceutical top management was predominantly composed of chemists, pharmacologists, and medical doctors along with commercial entrepreneurs. But in more recent times, it could be seen that the weight of the scientific disciplines in top management has declined in favor of very predominantly commercial/marketing and financial expertise to the point of being nearly nonexistent in some companies. This is a trend that is dangerous for research-based pharmaceutical companies that envisage a long-term strategy because the key strategic and pipeline decisions must be rooted in scientific, technological, and medical expertise. Both of these are essential to understand patient's needs and how to meet them with medicines that are highly sophisticated packages of scientific information incorporated into biologically active molecules. In view of the immense resources needed to discover and develop new medicines, it is of course important to include commercial expertise in top management but not to the exclusion of scientific expertise.

In conclusion, if a research-based pharmaceutical company wants to be sustainable for the long term, it is essential to have a strong and influential science, medical, and technological component in top management balanced by long-term visionary commercial expertise.

4.6 Productivity

Despite the many great successes of the pharmaceutical industry, there has been an apparent decline in R&D productivity during the past decades manifested by decreasing numbers of drugs approved per billion US dollar spent (Scannell et al. 2012). Paradoxically, a major reason for the apparent decline lies in these past and present achievements of the industry. The ever-growing number of successful drugs inherently increases the scientific, medical, safety, and regulatory hurdles that have to be overcome for new therapies. In addition, with a patent life of 20–25 years and an average preclinical/clinical drug development time of 10 or more years, a proprietary drug can be marketed by a company only for about 10–15 years. A large pharmaceutical company with annual sales of 10–30 billion dollars, therefore, strives to constantly invent a new drug portfolio of the same size (or ideally more) within a 10–15-year time frame just to maintain overall sales figures. To accomplish this, companies typically invest 10–20% of their revenues into R&D activities. And for these activities, the incentive to discover biomedical breakthrough drugs is high as outlined above. Moreover, according to a recent analysis, the first-, second-, and eventually third-in-class drugs will capture more than 90% of the market value in most therapeutic areas (Schulze and Ringel 2013), and thus the focus of many pharmaceutical companies today is to discover and develop first-in-class and best-in-class drugs. There was a widespread trend in the field during the late 1990s and early 2000s to industrialize drug discovery and to