

THE STORY OF NANOTECHNOLOGY PATENTS

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Nanotechnology, or the study and application of the unique properties of matter at the nanoscopic level, is thought to be the next big technological wave. Commentators such as Mark Lemley and others have expressed concerns, however, that patent thickets, anticommons, and other transaction costs may unduly hinder nanotechnology development. As the purportedly first major new technology to emerge since implementation of the Bayh-Dole Act, creation of the Federal Circuit, and relaxation of patentable subject matter and other patentability requirements all converged to favor greater patenting of basic scientific research, nanotechnology may face a higher level of upstream patenting than previously seen in other similarly disruptive technologies. Many commentators have therefore expressed concern that, absent patent pools, widespread and non-exclusive licensing, government exercise of march-in rights, or dedication to the public domain, nanotechnology will develop much more slowly than it might have otherwise.

This book chapter explores two possible alternative storylines for what nanotechnology development may look like, however. One possible alternative storyline is that the proponents of Bayh-Dole Act and similar proposals were correct: without patents and the opportunity for exclusive rights, government-funded basic research will languish unexploited for lack of private industry investment. Under this storyline, technological innovation in fields such as nanotechnology and biotechnology are multi-stage endeavors that are both expensive and uncertain. Without the safeguards of patent protection, the story goes, private fund sources will be unwilling to take of these risks. This book chapter therefore takes a closer look at what kinds of technologies may face the so-called “valley of death” and whether returns on investments in the intermediate stages of technological development truly cannot be appropriated except through patent protection on the enabling upstream research on which they are based.

A second possible alternative storyline is that the unprecedented degree of upstream patenting seen in nanotechnology may, at worst, be irrelevant. As seen in biotechnology and other fields in which university research figures prominently, patents are only one factor, and a relatively minor factor, in the transfer and translation of basic research into commercializable applications. Factors with potentially greater influence on downstream development are access to materials and to tacit knowledge, both of which are more rivalrous and excludable than the technical knowledge disclosed and protect in upstream patents. Moreover, technological development cycles in nanotechnology, biotechnology, and other “science-based” technologies may in many cases be so lengthy that many upstream patents may have expired before exerting much of a hold-up effect.

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