Integrating research and development: the emergence of rational drug design in the pharmaceutical industry

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Abstract

Rational drug design is a method for developing new pharmaceuticals that typically involves the elucidation of fundamental physiological mechanisms. It thus combines the quest for a scientific understanding of natural phenomena with the design of useful technology and hence integrates epistemic and practical aims of research and development. Case studies of the rational design of the cardiovascular drugs propranolol, captopril and losartan provide insights into characteristics and conditions of this integration. Rational drug design became possible in the 1950s when theoretical knowledge of drug-target interaction and experimental drug testing could interlock in cycles of mutual advancement. The integration does not, however, diminish the importance of basic research for pharmaceutical development. Rather, it can be shown that still in the 1990s, linear processes of innovation and the close combination of practical and epistemic work were interdependent.

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