Chapter 6

Collaborations for Innovation in the Bio-Pharmaceutical Industry:

An Exploratory Analysis on the Role of Platform Biotech Firms

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ABSTRACT

The advent of biotechnology in the late '80s revolutionized the pharmaceutical industry and, in particular, caused a strong division of labour in the innovation process. As a result, the capability to master technological collaborations with external organizations has become a critical success factor for incumbent pharmaceutical firms as well as product biotech firms. This chapter investigates the phenomenon by using a rich and purposively collected empirical basis about the organisational forms (e.g., partnerships, in- and out-licensing, outsourcing, technology purchasing) through which inter-organizational collaborations are put into practice along the phases of the bio-pharmaceutical innovation process, and about the specific role played in these collaborations by platform biotech firms. Results are interpreted by drawing into two relatively novel streams of research in the innovation management literature, dealing with the Open Innovation paradigm and the role of Technical and Scientific Services (TSS).

INTRODUCTION

The advent of biotechnology in the late '80s revolutionized the pharmaceutical industry. First, it changed the way in which R&D and innovation activities are carried out. The traditional and vertically integrated approach, where large pharmaceutical firms developed new drugs within their own boundaries has come to an end. Developing new drugs in the era of biotechnology requires to handle and integrate a number of scientific disciplines (e.g., genetics, proteomics, biochemistry), most of which are very distant from chemistry, that constituted instead the bulk of the critical knowledge basis in the traditional pharmaceutical innovation process (Byerlee, et al., 1999; Powell, 1998; Danzon, et al., 2005; Rothaermel & Deeds, 2004). As a consequence, the advent of biotechnology significantly affected also the structure of the pharmaceutical industry. A number of small start-ups were established to exploit the opportunities emerging from biotechnology: some of them focused on specific tasks (e.g., screening, lead optimization) of the new drug development process, others were born around newly created support technologies (e.g., High Throughput Screening) and usually mixed computer science and biological or chemical knowledge.

Starting from a vertically integrated pharmaceutical industry, where the process of new drug development was mastered by a limited number of large firms the bio-pharmaceutical industry is now characterized by a higher number of interconnected firms participating at different stages and with different roles at the drug development process. Scholars and practitioners in the bio-pharmaceutical industry usually distinguish between: (1) those firms, named product biotechs (Chiesa, 2003), willing to market directly their own drugs (e.g., Amgen or Genentech); (2) all the other firms, usually referred to as platform biotechs (Chiesa, 2003), providing support technologies or carrying out specific activities of the innovation process; (3) universities and research centres, supporting advances in basic technologies and biotech related scientific disciplines.

Following this distinction a number of authors have addressed the increasing role of collaborations in the biopharmaceutical industry, by investigating in particular the size and composition of the innovation networks as well as the strategic processes the central firm adopt to find its partners (Powell, et al., 1996; Henderson, et al., 1999; Orsenigo, et al., 2001; Niosi, 2003; McKelvey & Orsenigo, 2004; Muffatto & Giardina, 2003; Chiesa &Toletti, 2004; Gilsing & Nooteboomb, 2006). Although the topic has been already widely debated, there are still a number of issues that deserve further attention. First of all, most of extant contributions look at the network of collaborations as a whole, without distinguishing the stage of the drug development process where inter-organizational collaborations usually take place. We argue here, consistently with Chiaroni et al. (2008), that collaborations assume different forms accordingly to the phase of the innovation process at which they are aimed. For example, at the very beginning of the drug development process, relationships between partnering firms are mostly related to exploration activities (March, 1991), whereas exploitation tasks prevail as far as clinical trials are approached. Moreover, it is interesting to investigate whether and how the characteristics of the partners involved change accordingly and, more in particular, whether and how the role of platform biotech organizations changes along the innovation process.

The aim of the chapter is to address the above limitations through a rich and purposively collected empirical basis. Moreover, in order to advance not only the empirical knowledge but also the theoretical debate about the management of innovation in the biopharmaceutical industry, we introduce two insightful perspectives of analysis. First of all, we interpret the results about the nature of the innovation network in the different stages of the drug development process through the lens of the Open Innovation paradigm. Using the words

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