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Thesis title: " The determinants of collaboration modes in open innovation on the example of companies involved in research and development of biopharmaceutical products in Poland"

## SUMMARY

This dissertation concerns the topic of creating innovations in an open model by companies involved in research and development of biopharmaceutical products in Poland.

The phenomenon of creating innovations in an open model by companies dealing with research and development of biopharmaceutical products is described in the literature in a fragmentary way. There is also a clear lack of studies on the phenomenon of creating innovations in the open model by companies involved in research and development of biopharmaceutical products on the Polish market. To fill the above research gap, the intention of the author of this paper was to present, on theoretical and empirical grounds, the issue of creating innovation in an open model by enterprises involved in research and development of biopharmaceutical products in Poland, referring to the studied phenomenon in a holistic way, considering its complexity.

The main goal of the work is to describe the phenomenon of creating innovations in the open model in enterprises involved in research and development of biopharmaceutical products in Poland. The description of the phenomenon of creating innovation in the open model in enterprises dealing with research and development of biopharmaceutical products in Poland has been made using four parameters: identification of external partners co-creating biopharmaceutical products, identification of criteria for selecting external partners co-creating biopharmaceutical products, identification of modes of cooperation used in the creation of biopharmaceutical products and identification of factors determining the choice of modes of cooperation in the creation of biopharmaceutical products.

Achieving the main objective of the work required the implementation of 10 specific objectives, including five theoretical objectives and five empirical objectives.

The author has achieved all the goals, both on theoretical and empirical grounds. In the theoretical part of the work, the author identified, based on a literature review, all four parameters

describing the phenomenon of creating innovation in an open model by companies involved in research and development of biopharmaceutical products. Then, the author verified the parameters identified in the theoretical part, describing the creation of innovations in an open model by enterprises involved in research and development of biopharmaceutical products in Poland.

The theoretical part of the dissertation was developed based on a critical review of the literature on the subject in the field of open innovation in companies involved in research and development of biopharmaceutical products. For this purpose, the Web of Science database and the Google Scholar database were used. However, the empirical part of this work was based on the method of survey research using a tool in the form of a questionnaire and two research techniques, i.e. CATI and CAWI. The research was carried out on 138 randomly selected entities - enterprises involved in research and development of biopharmaceutical products in Poland.

The dissertation consists of an introduction, four substantive chapters, conclusion, bibliography and lists of tables and figures. The dissertation has a theoretical and empirical character. The theoretical part consists of the first three chapters, while the empirical part - the fourth chapter.

The first chapter discusses the concept of creating innovations in an open model. Classifications of open innovation models were characterized and an overview of selected empirical research on creating innovations in the open model in Poland was presented. Finally, a research gap was indicated regarding the description of the phenomenon of creating innovation in the open model in enterprises dealing with research and development of biopharmaceutical products in Poland.

The second chapter describes the research and development process for biopharmaceutical products. Then, companies dealing with research and development of biopharmaceutical products in Poland, which include biotechnology, pharmaceutical and clinical trials in health care, are characterized. A description of the types of external partners of companies dealing with research and development of biopharmaceutical products was also made, and the criteria for their selection based on the literature research were presented.

The third chapter focuses on discussing the modes of cooperation used by companies involved in research and development of biopharmaceutical products according to the literature on the subject. Such modes of cooperation as: venture capital, crowdsourcing, spin-off company and strategic alliance were characterized. Then, the selection factors for the previously identified forms

of cooperation in relation to companies involved in research and development of biopharmaceutical products are described. Reference was made to such selection factors as: the stage of innovation development, the type of partner, the company's knowledge and skills resources, and the company's financial resources.

The fourth chapter describes the methodology of empirical research, presents the results of own research conducted on a sample of 138 companies involved in research and development of biopharmaceutical products in Poland, and discusses them.

The conclusion contains a summary of conclusions resulting from the theoretical and empirical part of the work, recommendations for practitioners are formulated, certain limitations of the adopted research procedure and directions for further research are indicated.