Summary

Universities play an essential role in the knowledge-based economy since their interactions with societal stakeholders are a driving force for innovation and economic development. This role is generally described by the term knowledge valorisation: the creation of societal value from knowledge by translating research findings into innovative products, services, processes and/or business activities. Knowledge valorisation, however, is not an easy process and many barriers are described that hamper academics and societal stakeholder in collaborating to deliver societal value. This thesis aims to contribute to addressing these barriers by studying how valorisation processes can be improved. It focuses on the life sciences, a field that intrinsically combines a societal (e.g. prevention and treatment of diseases) and an economic (e.g. health care costs, competitiveness of firms and economic welfare) impact of knowledge.

The research builds upon a weak interpretation of the linear model which is aligned with a systems of innovation perspective. The weak interpretation of the linear model serves to understand the different phases of innovation and how they relate to each other. The systems of innovation perspective highlights that a wide variety of actors is involved, with each actor operating within the boundaries of institutions that are dependent on their own norms and values. The combination leads to the development of the valorisation cycle, which forms the basis of the research conducted in this thesis.

The thesis is subdivided into four sections, with each section looking into a specific sub question. The first section of this thesis uses the valorisation cycle to obtain a more in-depth understanding of barriers to knowledge valorisation, including the causal factors that contribute to these barriers. Chapter 4 studies these barriers in the context of the microbiota industry and Chapter 5 looks into innovation barriers for rabies prophylaxis and treatment. An important finding of these chapters is that innovation barriers that occur in one domain often have their root cause in another domain, obviating the need a model that considers these barriers comprehensively. Additionally, it finds that individual barriers are highly dependent on the innovation growth phase and market dynamics of the specific field in which valorisation occurs. On a deeper level, fragmentation across disciplinary and domain boundaries play an important role in establishing and maintaining these barriers. To effectively design interventions that can address such barriers, a comprehensive analysis of barriers across disciplines and domains is therefore essential.

To contribute to improved valorisation processes, three subsequent research questions are addressed that each study how improved knowledge among practitioners can contribute to innovation processes. In the second section, the ‘know-what’ dimension is explored, which focuses on the specific innovation configurations that are desired by different stakeholders. This know-what dimension informs researchers who aim to conduct use-inspired scientific research and stakeholders who are involved in the ‘fuzzy front end of innovation’, which occurs between the realization of research outcomes and the development of knowledge in the proof-of-concept and/or prototyping phase. In Chapter 6 and Chapter 7 the articulation of joint problems and projects in different phases of knowledge valorisation is explored, whereas Chapter 8 studies how alignment with unmet needs can benefit companies in an emerging market. It finds that
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Synchronization with unmet societal needs – including the need for curiosity-driven research – can improve the societal impact of academic research. In articulating such unmet needs, stakeholders from different domains should be included to prevent mismatches and ensure institutional concordance. Moreover, these chapters show that articulation of such unmet need may either align or exacerbate differing expectations between stakeholders and further research on the effect of existing collaborations on the alignment between stakeholders is warranted.

In the third section, the “know-why” dimension of knowledge valorisation is explored by looking into incentives and disincentives for collaborative activities. Chapter 9 studies the incentives that are put in place in universities across Europe, Chapter 10 studies how different outputs of academic research are influenced by academics having different motivational drivers and Chapter 11 investigates which barriers may hamper engagement of stakeholders in data sharing. The studies find that next to the often mentioned personal, professional and pecuniary drivers, academic researchers engage in valorisation because of moral drivers as well. These chapters additionally reveal the dual nature of the implementation of knowledge valorisation at universities, with both incentives and disincentives being implemented simultaneously. As a result, opportunity costs for engaging in knowledge valorisation are placed primarily at the individual level. Acknowledging a wide variety of knowledge valorisation activities in career progression decisions is recommended to improve researcher engagement.

Finally, the fourth section looks into the “know-how” that stakeholders have gathered on effective engagement knowledge valorisation processes. Chapter 12 looks into pre-existing valorisation models, Chapter 13 studies know-how gathered in the field of vaccine innovation and Chapter 14 synthesizes gathered know-how from the microbiota field. These chapters find that an inductively derived conceptual model can be used as a framework to describe and understand valorisation processes in general. Exact activities will remain contingent on contextual heterogeneities dependent on specific fields and innovation projects, and such a model therefore primarily serves a heuristic purpose to facilitate knowledge sharing. By contextualizing the developed model to the vaccine and microbiota industries, Chapter 13 and Chapter 14 show how this framework can aid innovation stakeholders in shaping and accelerating progress across the value cycle.

Combining the systems of innovation perspective with a weak interpretation of the linear model of innovation facilitated understanding of innovation dynamics and resulted in the Societal Impact Value Cycle (SIVC) as a conceptual model for knowledge valorisation. The SIVC provides insight into the iterative and parallel nature of innovation processes, conceptualizes the distinction between radical and incremental innovation, describes the function of unmet need identification and demand articulation and emphasizes the importance of use-inspired basic research. This model does not only inform policy makers on the nature of innovation barriers, but simultaneously provides stakeholders with an understanding of how they can contribute to improved innovation effectiveness themselves. To this purpose, the thesis concludes with ten key lessons on how knowledge valorisation processes in the life sciences can be improved.