



TRANSFORMING OPEN RESPONSIBLE RESEARCH AND INNOVATION THROUGH CHARM  
TORCH

DELIVERABLE D5.2- TORCH: REPORT ANALYSING VARIOUS SPIN-OFF CREATION'S APPROACHES

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## GLOSSARY OF KEY INITIALS, ABBREVIATIONS AND ACRONYMS

ANRT: Association Nationale de Recherche Technologique (France)  
 BDTO: Business Delegated to Other  
 BRBO: Business Run By Other  
 BRBS: Business Run By Scientist  
 BRWO: Business Run With Others  
 BV: Besloten Venootschap (Private Company in Dutch)  
 Col: Conflict of Interest  
 CRO: Company Registration Office (TCD)  
 EI: Enterprises Ireland  
 FTI: Fast Track to Innovation  
 HPSU: High-Potential Start-Up  
 ICF: Institut Catala de Finances  
 IDEX : Initiatives d'Excellence (France)  
 IP: Intellectual Property  
 IPR: Intellectual Property Rights  
 I-SITE: Initiative Science Innovation Territoires Economie (France)  
 IUT : Institut Universitaire de Technologie (France)  
 KT : Knowledge Transfer  
 RBSO : Research-based Spin-Off  
 SATT : Société d'Accélération du Transfert de Technologies (France)  
 SEP : Startup Europe Partnership  
 TR&I: Trinity Research and Innovation  
 TRL: Technology Readiness Level  
 TT: Technology Transfer  
 TTO: Technology Transfer Offices  
 UMR: Unité Mixte de Recherche (France)  
 VSNU: Association of the Universities in the Netherlands  
 WP: Work Package  
Universities  
 ELTE: Eötvös Loránd University  
 UB: University of Barcelona  
 UM: University of Montpellier  
 UU: Utrecht University  
 TCD: Trinity College of Dublin

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## EXECUTIVE SUMMARY: REPORT ANALYSING VARIOUS SPIN-OFF CREATION'S APPROACHES

TORCH Work Package 5, “*Strengthening cooperation between universities and enterprises*” centers on understanding universities’ strategies and procedures to partner with enterprises, with the involvement of societal stakeholders, in the full-spectrum of their activities and their engagement to develop an entrepreneurship culture among their institution, especially among researchers and students. This work package seeks to identify practices in each university to develop and support research and technology transfer partnerships with enterprises, practices to detect innovation inside the research units, and strategies implemented to develop, encourage and support researchers and students’ entrepreneurship with the creation of academic spin-off and students’ start-ups. Collaboration with enterprises for research, technology transfer and spin-off creation participate in developing applied scientific research with concrete economic and societal applications to answer current global challenges.

As a step further in this process, Deliverable 5.2 “*Spin-off creation approaches*” focuses on researchers’ entrepreneurship. The analysis is based on a qualitative survey developed by the WP leaders and filled out by representative of each of the partner institutions. This survey has included sections regarding national regulations for academic spin-off creation, local innovative ecosystem and universities’ internal strategies, policies and practices to encourage and support a mindset of entrepreneurship in research laboratories and its concrete application with the creation of academic spin-off valorising public research. The analysis is also strongly based on interviewees lead by universities’ representatives with researchers-entrepreneurs (researches who have created or have been involved in the process of spin-off creation), with administrative agents from research support office working on advising and supporting researchers, and in some cases with external actors engaged in supporting spin-off creation, for instance spin-off and or start-up incubators. Objective data and documents gathered through the survey and the personal feedback of researchers-entrepreneurs collected through interviews have allowed to detect incentives and disincentives at the four level of analysis already used in Deliverable 5.1: systemic, enterprises, university and individual.

To start the analysis, Deliverable 5.2 firstly focuses on the multi-faced definition of academic spin-off and the several pathways that this process can imply, as it is not a unique and linear process. Indeed, researchers’ roles and involvements may vary significantly from one spin-off to another, but also during the spin-off process. Researchers do not have a single role and can participate in several development phases. Harmen Jousma and Victor Scholten (2019)<sup>1</sup>, have identified four types of academic spin-off creation pathways that usually choose researchers involved in a spin-off creation process: Business Run by Scientist, Business Run With Other, Business Delegated to Other, Business Run by Others. Thus, researchers can become entrepreneurs themselves, create and manage the

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<sup>1</sup> ResearchGate, *New Technology Based Firms in the New Millenium, Chapter 4, The roles of scientists in the start-up of academic spin-off companies in the Life Sciences in the Netherlands* (Novembre 2009), <<https://www.researchgate.net/publication/235311024> Chapter 4 The Roles of Scientists in the Start-up of Academic Spin-off Companies in the Life Sciences in the Netherlands> [Accessed 29 Nov 2021]

spin-off, or they can choose to partially or totally delegated the business creation and management to a business entrepreneur in order to focus on the scientific side of the spin-off, for instance by providing scientific consultancy.

Then, the report draws a landscape analysis of national regulations regarding researchers' rights and obligations in creating an academic spin-off. It presents national and local initiatives and funds to support researchers in the process and to develop or consolidate an entrepreneurship mindset and culture within the society. Some policies are well established while other are still new or under development. In all countries, a willingness to increase the number of creations of qualitative start-ups and/or spin-off have been expressed at national level with the will to improve the support to academic spin-off creations. Strategies also plan to develop the promotion of entrepreneurship culture and mindset and valorise technology transfer. In addition, national organisms can organise competitions and provide grants to support spin-off creations.

Each partner institution' approach to spin-off creation and policy follows the context analysis. In all five universities, we can notice that spin-off creation is a procedural pathway for researchers. Clear rules and policy framework have been implemented in all universities regarding spin-off creation. Researchers are invited to speak up with their supervisor and to discuss their idea with the appropriate support office. They must build up a case and a sustainable business plan, among other, to be granted the authorization from a superior (for instance the Rector or the Dean of Research) to be involve in creating a spin-off. To do so, researchers may undertake statutory positions such as secondment, or be granted sabbatical, temporary leave of absence or other position limited in time according to each national regulation. Appropriate agreement must be concluded with the university regarding IPR, licensing, royalties, shares and other items. National regulation or universities rules can offer some advantages to researchers-entrepreneurs, such as retaining rights to pension, rights to advancement or remuneration for instance. Each spin-off creation is followed case by case by appropriate support office.

In addition, some universities have already developed strong support to researchers willing to set-up a spin-off, while other offer little in the process or have only recently embarked on this path. All universities provide administrative and legal support. Some of them offer in addition support in business and entrepreneurship skills, market analysis, sell, marketing, IP and other useful subjects for spin-off creation. Indeed, it appears that most of researchers have not developed business, entrepreneurial and legal skills, which can be an important disincentive preventing them from making their business creation project a reality. Some universities can also put in place initiatives to support spin-off creation, such as innovation days, competitions, grants or training programs.

Each of the partner institution is well integrated in the local innovation ecosystem and work in close relation with external actors providing support to spin-off creation, such as business incubators, networks of public-private bodies or governmental organisations. Those organisms offer training programs for entrepreneurs involved in creating an enterprise, at different stages of the process. Business incubators can focus on one thematic area, such as health or high-tech. However, the local innovative ecosystem organisation and functioning is not clear enough for researchers, who may

not know which organisms to contact for which kind of support. Also, several organisms may offer the same type of support. Thus, there is a need for more clarity in the ecosystem and for better coordination between the institutions.

Some common good practices implemented by the Alliance's partners emerge from our analysis and are introduced in the report. Providing researchers with financial and statutory advantages is one of the main good practices. It is indeed important for universities to provide researchers with advantages and incentives to retain scientific talents. The purpose being that researchers can remain attached to their parent institutions during the spin-off creation process and can re-integrate their positions later if wanted. Universities also provide researchers with appropriate administrative, legal and business support, create networks and connect researchers with investors, for example. Yet, this support may not be appropriate for researchers and may not be sufficient enough to answer their needs.

After those analysis, the word is given to researchers-entrepreneurs in a full-section, in order to draw their perspective on spin-off creation and present their needs to feel better supported by their institution, and for a better coordination and collaboration of the universities with external stakeholders within the innovative ecosystem. It has been noted that researchers who have been involved in spin-off creation process are highly impregnated with the societal utility of research and wish to make an impact and value public research outside of the sole purpose of publication. Spin-off creation is a professional project of high importance for researchers, which can be a real boost and twist in their career, but may also represent a career break and involve a risk of failure. Researchers must sometimes face their colleague's disapproval. Spin-off creation has also an important impact on researchers' personal lives that should not be underestimated.

Regarding systemic disincentives, researchers notice a lack of early-stage funds to support spin-off. They also underline the fact that it is not easy to find investors, as spin-off creation is investment-intensive and a high-risk project, or to find business entrepreneurs willing to deploy scientific technologies. Indeed, business entrepreneurs are not necessarily aware of public research units' resources in knowledge and technology that can be economically valued and have a great societal impact.

Potential preliminary recommendations for systemic, societal and individual levels by researchers have emerged from the interviews and are presented in the report. In addition, administrative agents from support offices have also taken advantage of this research on spin-off creation approach to formulate advices for future researchers-entrepreneurs.



## DEFINITIONS

**Knowledge Transfer:** A concept encompassing many different channels of interaction between science and industry, including collaborative research, research contracts, licensing, joint patenting and academic spin-off creation<sup>2</sup>.

**Researchers-entrepreneurs:** Researchers who have been involved in the process of academic spin-off creation.

**Spin-off:** Literature shows no consensus on academic spin-off definition<sup>3</sup>. The prior research has defined an academic spin-off as a business that is created by one or several members of a public research laboratory to commercialize an innovation (Bigliardi, Galati and Verbano, 2013<sup>4</sup>; McQueen and Wallmark, 1982<sup>5</sup>). Other authors say that academic spin-offs can result from a technology transfer (Matkin, 1990; Steffensen et al., 2000). Smilor et al. (1990) talk about "Research-Based spin-offs" (RBSO), which correspond to spin-off creation by a staff member of the university and/or base on a technology developed inside the university<sup>6</sup>. Other authors have defined academic spin-offs as new businesses that commercialize innovations from university research without the inventor necessarily being a part of the project (Nicolaou and Birley, 2003).

**Technology Transfer or Transfer of Technology:** Technology transfer is the movement of data, designs, inventions, materials, software, technical knowledge, or trade secrets from one organization to another or from one purpose to another. The technology transfer process is guided by the policies, procedures, and values of each organization involved in the process. Technology transfer can take place between universities, businesses, and governments, either formally or informally, to share skills, knowledge, technologies, manufacturing methods, and more. This form of knowledge transfer helps ensure that scientific and technological developments are available to a wider range of users who can then help develop or exploit it<sup>7</sup>.

<sup>2</sup> A. Campbell, C. Cavalade, C. Haunold, P. Karanikic and A. Piccaluga, Knowledge Transfer Metrics - Towards a European-wide set of harmonised indicators, Karlsson Dinnetz (2020), M. editor(s), Publications Office of the European Union, <<https://publications.jrc.ec.europa.eu/repository/handle/JRC120716>> [Accessed 29 Nov 2021]

<sup>3</sup> V. Bessière, M.G. Breyse, K. Messeghem, A. Ramarosan, S. Sammut. Drivers of growth: the case of French academic spin-off (2017). International Journal of Entrepreneurship and Innovation Management, Inderscience, The growth of academic spin-offs, pp.318- 342.

<sup>4</sup> B. Bigliardi, F. Galati and C. Verbano (2013). Evaluating Performance of University Spin-Off Companies: Lessons from Italy, Journal of technology management & innovation, pp. 29– 30.

<sup>5</sup> D.H. McQueen and J.T. Wallmark (1982). Spin-off companies from Chalmers University of Technology, Technovation, pp. 305–315.

<sup>6</sup> V. Francois. « Les dynamiques entrepreneuriales d'une spin-off universitaire en phase d'émergence et lauréate du concours BPI » (2015), *Revue de l'Entrepreneuriat*, vol. 14, no. 1, pp. 41-72.

<sup>7</sup> TWI, *What is technology transfer? (Definitions and examples)* <<https://www.twi-global.com/technical-knowledge/faqs/what-is-technology-transfer>> [Accessed 29 Nov 2021]

## ABSTRACT

Work Package 5 “*Strengthening cooperation between universities and enterprises*” third task, “*Report on spin-off creation approaches*”, aims at gathering and analysing the strategies implemented by the CHARM’EU Alliance’s universities to encourage spin-off creation and the support system set up for this purpose in each university. Indeed, spin-off creation represents a major channel through which universities contribute to technological development and innovation. This process has an important potential that need to be developed, encouraged and supported inside the CHARM’ Alliance’s universities.

## INTRODUCTION

### Objectives of Work Package 5 Task 3

Report on spin-off creation approaches aims at addressing three main objectives introduced in TORCH Grant Agreement<sup>8</sup>:

- Analysing the strategies that have been adopted by each university to encourage the creation of spin-off.
- Analysing how these strategies translate in terms of operating methods: support systems, agreements, shareholdings etc.
- Define a CHARM/EU common approach by providing inputs for WP8 and WP9.

### Why promoting and supporting spin-off creations inside universities?

Scholten (2006) demonstrates that academic spin-offs create value by producing more innovative products and services than other technological companies (Blair and Hitchens, 1998) and by expanding more quickly than non-academic spin-off (Shane and Stuart, 2002). Similarly, they contribute to economic growth by creating jobs and generating wealth<sup>9</sup>.

Knowledge and Technology Transfer, seeking to transform research into social, economic and cultural welfare, is one of the core duties of a knowledge institution. One way of valorising technologies is to create a spin-off, which means a spin-off emerging from public research conducted by a researcher or a team of researchers inside the university. Markan and al define spin-off as *“a business opportunity based on novel technology emerging from academia”*<sup>10</sup>. When we mention academic spin-off here, we are generally referring to private limited companies with one or more shareholders. Supporting spin-off creations thus consolidates and reaffirms one of the universities' objectives: the promotion of knowledge transfer. Spin-offs can provide a clear example of how human and economic resources can be invested in research to benefit society and improve the quality of our lives.

Spin-off creation represents a crucial dimension of universities' entrepreneurship. They reflect, at least to a certain extent, the research capacity and the universities' ability to transfer technologies from research to the society<sup>11</sup>. Knowledge institutions, as well as their employees, can contribute

<sup>8</sup> European Commission, Research Executive Agency, Grant Agreement Number 101017229 - TORCH

<sup>9</sup> V. Bessi re, M.G. Breyse, K. Messeghem, A. Ramarosan, S. Sammut. Drivers of growth: the case of French academic spin-off (2017). International Journal of Entrepreneurship and Innovation Management, Inderscience, The growth of academic spin-offs, pp.318- 342.

<sup>10</sup> G.D. Markman, D.S. Siegel & M. Wright (2008). Research and technology commercialization. Journal of Management Studies.

<sup>11</sup> E. Rasmussen, S. Mosey and M. Wright (2011). The evolution of entrepreneurial competencies: A longitudinal study of university spin-off venture emergence. Journal of Management Studies.

to the foundation and development of spin-off in several ways. Input provided by knowledge institutions and their employees may be paramount in the early stages, as it may allow them to translate scientific results into strong business cases. University spin-offs normally emerge as the initiative of researchers who put their entrepreneurial abilities to work by marketing their ideas with the assessment and, if necessary, the participation of their parent institution.

The university can participate in many ways but is normally most present in the spin-off's early stages, negotiating licences, contracts and agreements, developing business plans, looking for financial resources for the spin off, providing it with installations and state of the art scientific equipment and hosting the company in its own institutional setting, which favours the company's development. In exchange, the university itself receives the payment of a (licensing) fee or takes a share in the spin-off's profits or sales. On certain occasions, it agrees to reserve facilities to oversee the efficient use of the technology or knowledge generated by the spin-off or even becomes a shareholder<sup>12</sup>.

In some of the universities, spin-off creation is a recent process that needs to be more mainstreamed and encouraged. It is essential to stimulate the creation plus to support the continued growth of academic spin-off and ensuring that there are no impediments to their upscaling. Well-functioning, appropriate and stable framework conditions should be set up for researchers not to be inhibited or discouraged by the process of spin-off creation. Unnecessary complexity should be discarded, potential negative effects minimized, and opportunities shall be optimized. Even though key developments can be underlined in the Alliance' universities to improve spin-off creation support, interviewing administrative agents and researchers that have been involved in a spin-off creation process have underlined barriers that must be overcome. This is high on the agenda within every university, and the need is felt to tackle the challenges.

Creating a spin-off is not an insignificant decision for researchers. It has indeed a real impact on researchers' works, careers and even personal lives. It is a very time-consuming process that requires specific skills that researchers have not necessarily acquired in their training and work. Therefore, there is a major need for universities not only to encourage but also to facilitate and accompany researchers in the spin-off creation process to create value from research, by lifting real and perceived constraints and barriers.

Creating a spin-off being a high-risk project, universities must secure researchers-entrepreneurs' positions and careers, notably by offering them a security net in case of failure, for instance through specific statutory positions, flexibility and advantages. Moreover, concrete support on spin-off creation must be proposed as researchers are usually not well-trained to business development and management. Indeed, the academic research and the business world have different timing, different rules, and different expectations that researchers are not necessarily aware of or familiar with. Support and incentives must be broad: on administrative, legal and financial aspects, advice on how

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<sup>12</sup> Senesciencia number 4, The University Spin-off, <<http://www.ub.edu/senesciencia/noticia/university-spin-off/>> [Accessed 29 Nov 2021]

to build a reliable team and associate with business entrepreneurs, how to find funding, how to manage a business and a team etc. Furthermore, entrepreneurial career path for researchers should be legitimised and highlighted as it is not yet a well-known and recognised option. Universities must reinforce positive perceptions of entrepreneurship to bring cultural changes and underline the value added by researchers-entrepreneurs to society.

Also, universities do not work alone on supporting spin-off creation, they must be well-integrated into the local, regional and national ecosystem gathering actors and initiatives supporting entrepreneurs that can also fit the needs of researchers involved in setting up an academic spin-off. For instance, many communities or municipalities have business incubators where spin-off can receive coaching, mentoring, offices hosting, spin-off financing and all sorts of programmes designed to help the companies get off to a better start.

### Report's plan

In this report, we will introduce national strategies and regulations referring to spin-off creation of Alliance's countries, to better contextualize the environment in which each university is situated. Then, we will present the approach of each university to spin-off creation, including organisation of spin-off support, university' rules and policies and, in addition, their interactions with the local ecosystem. Some of the best practices will be detected. Finally, we will present and analyse researchers' viewpoints on academic spin-off creation process, including regards to systemic, social actors, university and individual levels. This analysis will lead to potential recommendations that could be implemented at systemic and university level to better support academic spin-off creation processes within the Alliance.

## METHODS

To collect needed and appropriate data to depict the national contexts and develop a comparative analysis of universities' strategies, best practices and challenges on academic spin-off creation support, the following methodology was implemented:

### Literature review and documents analysis

The identification of national regulations, policies and strategies and universities' practices and activities partly emerges from a literature review, websites, including national ministries, regional agencies, research institutes and centres' websites and documents, national regulation, university policy/vision documents, documents supporting different projects etc.

### Common survey

A qualitative survey with closed and open questions was developed by the WP5 leading team (UM) and filled by representatives of each partner university. Our intention was to follow similar lines of questioning for each university while still allowing space for the individual characteristics. This data collection method has allowed the collection of key data (national/regional/local regulations, universities' practices) and facilitated a comparative analysis between the CHARM' alliance's members.

### Case studies through interviews

Semi-directed interviews, following interview matrixes prepared by WP5 leading team, were conducted by each university with appropriate researchers that have created a spin-off or that have taken part of the creation and discussions with appropriate administrative agents, projects' initiators and incubation officers.

**Table 1.** Numbers of interviewees per category of actors

| Universities | Researchers who have created or participated in a spin-off creation | Administrative agents working on spin-off creation support and/or incubation |
|--------------|---|--|
| ELTE         | 2   | -  |
| UB           | 1   | 4  |
| UM           | 4   | 4  |
| UU           | 4   | 2  |
| TCD          | -   | -  |

### Meetings

WP5 leaders organised three online meetings to discuss progress on the deliverables.

### Levels of analysis

Incentives and incentives are identified and categorised in four levels:

**Table 2.** Levels of analysis for incentives and disincentives

| Levels           | Definition   |
|------------------|--|
| Systemic Level   | Global, EU and national level  |
| Societal Level   | Societal stakeholders (business cluster, enterprises for example)  |
| University Level | This level relates to different levels of the university (research teams, departments, faculties and universities) |
| Individual Level | Individual (dis)incentives relate to personal and professional aspects. For example, researchers, Phd students.    |

## 1. OVERVIEW OF ACADEMIC SPIN-OFFS CREATION'S PATHWAYS

The association between spin-offs and university institutions is of mutual benefit. For spin-offs, universities open the doors to technological resources, networks, and first-level knowledge. For the university, supporting the spin-off consolidates and reaffirms its main objectives of technology and knowledge transfer. It gives the university national or even international radiation and recognition. In practical terms, spin-off creation may also mean valuable income that can be reinvested in research and access to the labour market for the researchers the university itself has trained. The promotion of strategic scientific areas also contributes to a country's regional development.

Academic spin-off creation process is differentiated. The different existing definitions of the terms "academic spin-off" suggest that spin-offs are divided in two categories: pure spin-offs and hybrids (Fryges and Wright, 2014). The first are derived from research projects, which are carried out by a member of a research organization. The latter refers to projects that are related to studies that are carried out by a surrogate entrepreneur (Lundqvist, 2014)<sup>13</sup>.

Researchers' roles and involvements may vary significantly from one spin-off to another, but also during the process. Researchers do not have a single role and can participate in several development phases. Harmen Jousma and Victor Scholten, in their article in *New Technology Bases Firms in the New Millenium* (2019)<sup>14</sup> identified four types of academic spin-off creation pathways that usually choose researchers involved in a spin-off creation process:

- **Business Run by Scientist (BRBS):** Scientists independently generate the idea to turn their science into business and are responsible for all the activities needed in the spin-off process. They are involved in all types of roles and occasionally, often when lacking experience, they seek support from experts in the form of advice and feedback. Usually, they stay active in the company as a managing director or CEO and oversee the entire process of starting and running the business.
- **Business Run with Others (BRWO):** These scientists are comparable to BRBS scientists with respect to the idea to start a spin-off, but they found an entrepreneur partner who was more experienced in business related areas. As such, researchers are less involved in the managerial role. During the spin-off process they are involved in many non-science related activities for instance getting approval for the spin-off among new clients or investors. In that position, scientists take the champion role by promoting the spin-off.

<sup>13</sup> V. Bessière, M.G. Breyse, K. Messeghem, A. Ramarosan, S. Sammut (2017). Drivers of growth: the case of French academic spin-off. *International Journal of Entrepreneurship and Innovation Management*, Inderscience, 2017, The growth of academic spin-offs, pp.318- 342.

<sup>14</sup> ResearchGate, *New Technology Based Firms in the New Millenium*, Chapter 4, The roles of scientists in the start-up of academic spin-off companies in the Life Sciences in the Netherlands (November 2009), <<https://www.researchgate.net/publication/235311024> Chapter 4 The Roles of Scientists in the Start-up of Academic Spin-off Companies in the Life Sciences in the Netherlands> [Accessed 29 Nov 2021]



- **Business Delegated to Others (BDTO):** The idea and initial activities to start a spin-off is initiated by researchers. During the early phase they take the role of inventor and entrepreneur. However, researchers do not have the ambition or believe lacking the appropriate skills to manage the spin-off. Therefore, scientists look for a qualified CEO or CBO (Chief Business Officer) to take the role of manager and delegated business-related matters. After the start of the spin-off, researchers remain in charge or have a say in decision making and influence on the course of activities.
- **Business Run by Others (BRBO):** In this role, researchers do not necessarily initiate the start of the spin-off. Scientists may point out the idea, but the initiative to start the company is taken by a third person (for example an investor or serial entrepreneur). This third person might become the CEO or will find a qualified person to manage the spin-off. Researchers have no control and their involvement in the spin-off process is limited to scientific advice or performing research in support of the company's development. Hence, scientists are involved in the inventor role and occasionally as entrepreneurs. This means that all other activities, even the opportunity recognition, are executed by others and researchers have limited influence on spin-off or running of the business. In this case, the technology does come out from the university, yet it is not an initiative promoted by researchers but by entrepreneurs and investors.

Clarysse and Moray (2004)<sup>15</sup> support an active role for the scientists in managing a spin-off.

Researchers have access to different pathways to manage their time dedicated to spin-off creation. They can work on it during their free time outside the academia (if the university agrees) or undertake a statutory position with specific benefits to create the spin-off while conserving their academic position and staying attached to their parent institution. These statutory positions are limited on time and can be renewed for a maximum period. Scientists can also decide to quit the university to start an entrepreneurial journey, but this choice can be very risky as the spin-off creation is a very uncertain process. Also, seeing researchers leaving the academia consists of scientific talents loss for universities that is not desirable. Moreover, if the national conditions for spin-off creation are not good enough in the country, researchers may leave to find better national ecosystems for their project. Therefore, governments and universities must implement statutory incentives for researchers to get started in spin-off creation process while being able to stay attached to their university and to prevent brain drain.

It can also happen that researchers follow the first path, "Business Run by Scientist", because they do not manage to sell their technologies or to find an entrepreneur interested in setting-up the spin-off company. In those cases, researchers decide to create the academic spin-off by themselves

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<sup>15</sup> B. Clarysse and N. Moray (2004) "A process study of entrepreneurial team formation: the case of a research-based spin-off", Journal of Business Venturing.

because they believe that their technology would be very useful for society and life-changing for certain people, for instance for patients with specific disabilities, even if the market is not huge.

On Business Delegated to Other or Run by Other pathways, researchers can provide Scientific Consultancy to the Spin-Off while staying attached to their institution. Each university has its own Scientific Policy. When the scientific consultancy period is over (according to each universities' policies), researchers can decide to reintegrate their original position inside the university full-time or continue the spin-off's adventure for instance by taking an availability or sabbatical. The researcher can also decide to leave the university to be employed in the spin-off.

In all cases, researchers' implication in academic spin-off is of vital importance because they have a unique "know-how" knowledge (for instance protocols, prototypes ...). Also, the inputs of scientists allow a constant flow of innovative idea to improve the spin-off products and services.

Universities usually holds the Intellectual Property of the technology that will be commercialized through the spin-off. Thus, an agreement must be negotiated between the university and the spin-off, to deal with licensing Intellectual Property Rights, Royalties and/or other terms. Universities can receive the payment of fees or take a share in the spin-off's profits or sales. On certain occasions, they can also become a shareholder of the spin-off.

## 2. NATIONAL STRATEGIES AND REGULATIONS ON ACADEMIC SPIN-OFF CREATION

### 2.1 Hungary's national strategies and regulation on academic spin-off creation

The National Office of Intellectual Property published a study<sup>16</sup> in 2018 providing a comparative analysis and recommendations of *IP management and the exploitation of research results at public research places*, where ELTE was among the selected universities interviewed. This document refers to the former *RDI Strategy*<sup>17</sup> of the time, which, in addition to the general development of the innovation ecosystem, formulates as a priority the goal of increasing the R&D expenditure and the number of researchers. The strategy revolves around three main elements: the production of knowledge, the use of knowledge and the flow of knowledge (knowledge transfer) are the cornerstones. Since then, however, a constant development due to many new pieces of information and experiences has been taking place in this area. It is reflected in the recently accepted *National Research, Development and Innovation Strategy of Hungary for 2021-2030*<sup>18</sup> and the new version of the *National Strategy for Smart Specialisation (S3) 2021-2027*<sup>19</sup>. (The elaboration of S3 (2014-2020)<sup>20</sup> was an ex-ante condition of receiving the EU funds allocated to RDI.)

The novel S3 can be seen as an umbrella strategy for the strategic planning documents of three areas: the RDI Strategy, the Strategy for Strengthening Hungarian Micro, Small and Medium Enterprises, and info-communications and the National Digitalisation Strategy, which is about to be adopted by the government. The integration and alignment of the RDI strategy and the S3 are essential to boost Hungary's RDI performance in this decade. While the former defines the horizontal objectives and RDI-specific areas of intervention necessary for the development of the innovation ecosystem, S3 builds on the pillars of the strategic objectives of the three areas and sets priorities with high development potential, where the concentration of resources can contribute to increasing the competitiveness of the economy.

Aligned with the recommended EU methodology, S3 priorities are selected through an "entrepreneurial discovery process" (EDP). This comprises of a national level questionnaire survey among the actors of the innovation ecosystem and the establishment of the *Territorial Innovation*

<sup>16</sup> Szellemtulajdon-kezelés és a kutatási eredmények hasznosítása a közfinanszírozású kutatóhelyeken. Összehasonlító elemzés és gyakorlati javaslatok. SZTNH, 2018 (Intellectual property management and the exploitation of research results at public research places. Comparative analysis and recommendations.)

<sup>17</sup> National Office of Intellectual Property, Hungary (2018) <[https://www.sztnh.gov.hu/sites/default/files/egyetemi\\_kutatas\\_0625.pdf](https://www.sztnh.gov.hu/sites/default/files/egyetemi_kutatas_0625.pdf)> [Accessed 29 Nov 2021]

<sup>18</sup> RDI Strategy of Hungary, 2021-2030: [Magyarország Kutatási, Fejlesztési és Innovációs Stratégiája \(2021–2030\) itt tölthető le.](#) [Accessed 29 Nov 2021]

<sup>19</sup> National Smart Specialisation Strategy 2021-2027 (English version): [file:///C:/Users/win10/AppData/Local/Temp/S3\\_strategy2021.07.30.pdf](file:///C:/Users/win10/AppData/Local/Temp/S3_strategy2021.07.30.pdf), and NRDI Office: <https://nkfih.gov.hu/english/national-smart-specialisation-strategy/s3-2021-2027> [Accessed 29 Nov 2021]

<sup>20</sup> National Smart Specialisation Strategy 2014-2020: [National Smart Specialisation Strategy \(S3\)](#) and NRDI Office: <https://nkfih.gov.hu/english/national-smart-specialisation-strategy/s3-2014-2020> [Accessed 29 Nov 2021]

*Platforms (ITPs)*<sup>21</sup> network based on university centres, with a focus on stakeholder cooperation. ELTE is a member of the Budapest ITP.

ELTE was also among the interviewees of another, academic survey<sup>22</sup> of university enterprises in Hungary, investigating mainly the regulation of university IP and technology transfer. There are a range of national regulations related to spin-off creation listed here, which have also been adjusted from time to time to the developing strategic goals. These comprise of laws on public servants, RDI, national higher education<sup>23</sup> and taxation, as well. Herewith we highlight some important sections:

*RDI Act section 4 (3) - spin-off definition:* "exploiting enterprise" means a company established for the purpose of the exploitation of intellectual property, which has become the holder or user of intellectual property rights created in the budgetary research centre or in the higher education institution, respectively, on the basis of a non-monetary contribution, transfer or exploitation contract,"<sup>24</sup>

*Public Servant Act section 41 (5):* "By way of derogation from paragraph (2) b), in terms of Act LXXVI of 2014 on Scientific Research, Development and Innovation RDI<sup>25</sup> (hereinafter: RDI Act), a public servant employed by a budgetary research institution - in accordance with the provisions of the Transparency Regulations of the research institution pursuant to Section 34 /A (2) of RDI Act, with the prior written consent of the employer - may be a member or a senior official of the exploiting company and the institutional company defined by the national higher education law, or may establish with this company an additional legal relationship for the purpose of working."<sup>26</sup>

For research sites operated in the form of an enterprise, *tax incentives* on social contribution tax on wages were introduced in 2019 for the employment of researchers and in support of research activities.<sup>27</sup> Other tax relieves decrease the tax base regarding corporate tax, local business tax or

<sup>21</sup> Territorial Innovation Platforms. *NRDI Office*: <https://nkfih.gov.hu/for-the-applicants/territorial-innovation-platforms/territorial-innovation> [Accessed 29 Nov 2021]

<sup>22</sup> K. Erdős (2019). Egyetemi vállalkozások Magyarországon – újrarendelve? *Közgazdasági szemle*, year IX Vi., (pp. 305 –329) (University Enterprises in Hungary - Resought? *A joint research of the HAS and the University of Pécs*) <http://real.mtak.hu/91841/1/04ErdosKatalinA.pdf> [Accessed 29 Nov 2021]

<sup>23</sup> Act CCIV of 2011 on National Higher Education (2011. évi CCIV. törvény a nemzeti felsőoktatásról) <<https://net.jogtar.hu/jogszabaly?docid=a1100204.tv>> [Accessed 29 Nov 2021]

<sup>24</sup> Act LXXVI of 2014 on Scientific Research, Development and Innovation (RDI Act) (2014. évi LXXVI. 3. §. (4) *törvény a tudományos kutatásról, fejlesztésről és innovációról*): <<https://net.jogtar.hu/jogszabaly?docid=a1400076.tv>> [Accessed 29 Nov 2021]

<sup>25</sup> Act LXXVI of 2014 on Scientific Research, Development and Innovation (2014. évi LXXVI. törvény a tudományos kutatásról, fejlesztésről és innovációról): <https://uj.jogtar.hu/#doc/db/1/id/A1400076.TV/ts/20210528/lr/lawrefP%2845-47%29> [Accessed 29 Nov 2021]

<sup>26</sup> Public Servant Act (1992. évi XXXIII. törvény a közalkalmazottak jogállásáról); *Collection of Effective Legal Regulations*: <<https://net.jogtar.hu/jogszabaly?docid=99200033.tv>> [Accessed 29 Nov 2021]

<sup>27</sup> Section 15 and 16 of Act LII of 2018 on Social Contribution Tax (2018. évi LII. törvény a szociális hozzájárulási adóról, 15. és 16. §) <<https://net.jogtar.hu/jogszabaly?docid=a1800052.tv>> [Accessed 29 Nov 2021]

innovation contributions.<sup>28</sup> The efficient, fast and flexible utilization of resources for RDI is supported by the *public procurement rules*<sup>29</sup> that came into force on 1 January 2021. The new provisions allow procurements of goods and services directly related to RDI activities to be exempted from the public procurement obligation up to the EU public procurement threshold.

## 2.2 Ireland's national strategies and regulation on academic spin-off creation

The "Governance of Irish Universities" 2012 document<sup>30</sup>, published by the Higher Education Authority and the Irish Universities Association, underlines in Part 2, "*Universities Code: Principles and Best Practice*", 2.13, "*Diversification and Establishment of Subsidiaries*" that universities can be involved in the creation of new subsidiaries "*As one of the functions of a university, section 13 (2) (c) of the 1997 Act*<sup>31</sup> provides that a university, "... may establish by incorporation in the State or elsewhere, or participate in the establishment of, such trading, research or other corporations as it thinks fit for the purpose of promoting or assisting, or in connection with the functions of, the university." Any proposals for the diversification of a university's activities, particularly in relation to diversification into areas outside the core functions of teaching and research, or for the establishment of new subsidiaries should require the approval of the governing authority, which should consider the full implications, including any financial or other risks, for the university.

In addition, the "Innovation 2020"<sup>32</sup> strategy, Action 2.9 plans to promote entrepreneurship by progressing "*the implementation of the actions in the National Policy Statement on Entrepreneurship in Ireland*". Indeed, Entrepreneurship and innovation go hand in hand: entrepreneurs need access to innovative ideas, products, processes and services, and, equally, innovative products, processes and services need entrepreneurs who are prepared to take risks and develop appropriate business strategies to bring them to market. The National Policy Statement on Entrepreneurship in Ireland<sup>33</sup> sets out the Government's plan to deliver an ambitious but realistic increase in the numbers of quality start-ups in Ireland. Action 3.13 of "Innovation 2020" strategy plans for enhancing innovation and entrepreneurship related skills by establishing "*a new initiative to encourage a culture change and enable the structured progression of early-career stage researchers to careers in entrepreneurship*".

<sup>28</sup> Section 7 (1) t) of Act LXXXI. of 1996 on Corporate Tax and Dividend Tax (1996. évi LXXXI. törvény a társasági adóról és az osztalékadóról 7. § (1) t)) <<https://net.jogtar.hu/jogszabaly?docid=99600081.tv>> [Accessed 29 Nov 2021]

<sup>29</sup> Government Info: easing public procurement rules for RDI. <<https://kormany.hu/hirek/konnyitett-kozbeszerzesi-szabalyok-segitik-a-kutatas-fejlesztési-es-innovációs-forrasok-felhasznalását>> Accessed 29 Nov 2021]

<sup>30</sup> Higher Education Authority and The Irish Universities Association, Governance of Irish Universities (2012)

<sup>31</sup> Universities Act, 1997

<sup>32</sup> Government of Ireland, *Innovation 2020, Excellence Talent Impact, Ireland's strategy for research and development, science and technology*, <<https://www.gov.ie/en/publication/7287b-innovation-2020/>> [Accessed 29 Nov 2021]

<sup>33</sup> Department of Enterprise, Trade and Employment, *National Policy Statement on Entrepreneurship in Ireland 2014*, <<https://enterprise.gov.ie/en/Publications/National-Policy-Statement-on-Entrepreneurship-in-Ireland-2014.html>> [Accessed 29 Nov 2021]

### 2.3 Spain's national strategy and regulation on academic spin-off creation

In Spain, two laws are applicable for academic spin-off creation:

- The organic law 4/2007 of Universities (LOMLOU 4/2007)<sup>34</sup>
- Law 14/2011 for Science, Technology and Innovation<sup>35</sup>

These laws introduce rules universities and researchers must follow in the case of a spin-off creation by researchers attached to the university.

The organic law 4/2007 of Universities, Article 83, Paragraph 3, academic staff creating a “*technology-based company*” or developing a company “*from patents or results generated by research projects financed totally or partially with public funds and carried out in universities*” may apply for authorisation to join that undertaking on temporary leave of absence. The Government, following a report from the General Conference on University Policy, regulates the conditions and procedure for the granting of such leave, which, in any case, may only be granted for a maximum limit of five years. During this period, surpluses shall be entitled to the reservation of the post and its calculation for the purposes of seniority. If, prior to the end of the period for which the leave of absence was granted, the researcher does not request re-entry into active service, he shall be declared ex officio to be on voluntary leave for the particular interest.

The law 14/2021, Título II, *Recursos humanos dedicados a la investigación*, Capítulo I, Sección 1, Artículo 17, *Movilidad del personal investigador*, underlines the promotion of intersectoral mobility of researchers to the private sector as it is a way to reinforce scientific knowledge and the professional career of researchers: “*1. Las Universidades públicas, los Organismos Públicos de Investigación de la Administración General del Estado, los Organismos de investigación de otras Administraciones Públicas y los centros del Sistema Nacional de Salud o vinculados o concertados con éste, promoverán la movilidad geográfica, intersectorial e interdisciplinaria, así como la movilidad entre los sectores público y privado en los términos previstos en este artículo, y reconocerán su valor como un medio para reforzar los conocimientos científicos y el desarrollo profesional del personal investigador*”. The mobility and exchange of researchers between different public and private agents, in the framework of the European Union and in the framework of international reciprocal cooperation agreements and public-private partnership agreements, which shall be developed. Mobility is valorised in selection and professional evaluation process.

Secondment or Temporary leave of absence could be granted for the performance of scientific and technical research tasks, technological development, transfer or dissemination of knowledge

<sup>34</sup> <<https://www.boe.es/boe/dias/2007/04/13/pdfs/A16241-16260.pdf>> [Accessed 29 Nov 2021]

<sup>35</sup> Law 14/2011, of June 1st on “*Science, Technology and Innovation*”. (*Ley de la Ciencia, la Tecnología y la Innovación*, BOE 131 of June 2nd, 2011), <<https://www.boe.es/buscar/doc.php?id=BOE-A-2011-9617&lang=en>> [Accessed 29 Nov 2021]



related to the activity that the research personnel has been carrying out in the public university or organisation of origin. To this end, the unit of the public university or organisation of origin in which they provide services must issue a favourable report that includes the points:

- The duration of the temporary leave of absence may not exceed five years, and it shall not be possible, once this period has elapsed, to grant a new temporary leave of absence for the same reason until at least two years have elapsed since returning to active service or returning to work from the previous leave of absence.
- During this period, research personnel on temporary leave shall not receive remuneration for their original post and shall be entitled to the reservation of the post, to its calculation for the purposes of seniority, to the consolidation of personal grade in the cases that correspond according to the applicable regulations, and to the evaluation of research activity, where appropriate.
- If, before the end of the period for which the temporary leave of absence was granted, the former employee does not request reinstatement in active service or, where appropriate, reinstatement in his/her job, he/she shall be declared ex officio to be on leave on personal grounds or in a similar situation for employment staff that does not entail the reservation of the job, allowing, at least, the possibility of requesting reinstatement in the public university or organisation of origin.

Artículo 19, *Colaboradores científicos y tecnológicos*, on scientific and technological collaborations. Researchers can be temporarily seconded on a part time or full-time basis to collaborate in the tasks of drawing up, managing, monitoring and evaluating scientific and technical research programmes, subject to prior authorisation from the competent bodies and the entity in which the research personnel provide their services.

#### 2.4 France's national strategy and regulations on academic spin-off creation

In France, three statutory positions have been implemented at the national level to allow public researchers and professors-researchers to participate in the life of an enterprise or to the creation of a spin-off.

- **The Detachment/Secondment position (“Détachement”)<sup>36</sup>** : With this statutory position, researchers and professors-researchers can be full-time detached in enterprises or private organisms to exercise functions of training, research, research valorisation, scientific and technical dissemination for a five-year period that can be renewed within a limit of ten years. Researchers are disposed out of their original body (the university) but continue to benefit from rights to advancement and pension entitlements. No agreement needs to be

<sup>36</sup> Décret n° 84-431 du 6 juin 1984 fixant les dispositions statutaires communes applicables aux enseignants-chercheurs et portant statut particulier du corps des professeurs des universités et du corps des maîtres de conférences.

implemented in this case. The agents' salary must be paid by the enterprise or private organism. When the detachment period is over, researchers and professors-researchers reintegrate by rights their original body and in the same establishment.

- **Provision<sup>37</sup> or Delegation statutory positions<sup>38</sup>** : Provision is the status for researchers and delegation is the status for researchers-lecturers. These two positions enable researchers and professors-researchers to work out of their original administration part-time or full-time while keeping their remuneration and keeping benefiting from their rights attached to their original activity. They can work for an establishment or office within the scope of the Ministry of Higher Education, Research and Innovation to perform management functions. They can undertake these positions for a period of five years, renewable within a ten-year limit. For any provision or delegation' request, a convention must be signed between the original administration and the host institution. The remuneration is maintained by the parent institution but there must be a repayment of the salary claim.
- **Availability position:** There are two possibilities of availability:

1- A two-year availability to create or take over a business;

2- A five-year availability for personal convenience.

Thus, a researcher or researcher-lecturer can choose one of these positions to create or participate in the creation of an academic spin-off, for instance through scientific consultancy.

French national regulations have evolved since 1999 to enable more flexibility in the mobility career of public researchers and provide them with more possibilities to create academic spin-off. The Programming Law for Research 2021-2030 softens the "researcher-entrepreneur's regime with a broaden framework for researchers to create their enterprise. This law is the last in date of a long journey of legislative changes.

Firstly, the 1999 law for Innovation and Research (Law Allègre) has established a legal framework to encourage participation or creation of an enterprise for researchers. This law has been updated in 2006 by The Programming Law for Research, in 2019 by the law PACTE (Law for the Enterprises' Growth and Transformation) and by the law number 2020-1674 of 24<sup>th</sup> of December 2020 (article 24). The dispositions are translated in the French Code of Research<sup>39</sup> :

<sup>37</sup> Décret n°85-986 du 16 septembre 1985: relatif au régime particulier de certaines positions des fonctionnaires de l'État, à la mise à disposition, à l'intégration et à la cessation définitive de fonctions.

<sup>38</sup> Décret n° 84-431 du 6 juin 1984 fixant les dispositions statutaires communes applicables aux enseignants-chercheurs et portant statut particulier du corps des professeurs des universités et du corps des maîtres de conférences.

<sup>39</sup> <<https://www.legifrance.gouv.fr/codes/id/LEGITEXT000006071190/>> [Accessed 29 Nov 2021]



- **Article 25.1** of the Law on Research and Innovation, corresponding to Articles L.531-1 and following of the Code of Research: public researchers can create or participate as directors, associates, or associate-directors to new or existing enterprises commercializing public research results. They can take stakes in the enterprise capital without limitations. The researcher is placed in detachment, provision, delegation or availability and can dedicate 100% of his or her time to the enterprise' creation.
- **Article 25.1 bis** (implemented by The Programme Law for Research 2021-2030), corresponding to article L531-6 focuses on participation of research staff as partners or managers in an existing company.
- **Article 25.2** of the Law on Research and Innovation, corresponding to Articles L. 531-8 and following of the Code of Research: public researchers can provide scientific support to a new or existing enterprise commercializing public research results or educational results up to 50% of their working time.
- **Article 25.3** of the Law on Research and Innovation, corresponding to Articles L.531-12 and following of the Code of Research: public researchers can participate in new or existing commercial companies' executive bodies. They can participate in the firm's social capital up to 32%. Researchers remain working full-time for the university. The pursued objective is to increase the enterprise's awareness on the progresses of fundamental research and its applications.

For each of those possibilities for researchers to be involved in an enterprise, the maximum time for a period of involvement is three years, renewable within a limit of ten years.

Nowadays, the researchers have the possibility to preserve their social shares in a company even after the end of their scientific consultancy period, in the limit of 49%, which was not the case before. The university must be informed.

One of the objectives of Law PACTE is to simplify the path for researchers willing to participate in the creation or to create an enterprise to valorise their research. It has started from an observation: since 2000, only 231 researchers' officials have requested an authorisation to create their enterprise, less than 0.01% of people working in the public research each year. This finding has been identified as a result of the rigidity of the French law before law PACTE regarding partnerships between public and private. Thus, law PACTE aims at overcoming these restrictions to facilitate the pathway of spin-off creation for public researchers.

In addition, the High Authority of Transparency of Public Life<sup>40</sup> may oversee the control of potential conflicts of interests between public researchers and the spin-off, upon request from institutions in the following cases:

<sup>40</sup> Haute autorité pour la transparence de la vie publique, <<https://www.hatvp.fr/>> [Accessed 29 Nov 2021]

- At the time of application for the Law for Innovation's devices: The researcher's employing establishment may, prior to its decision, request the opinion of the High Authority for the Transparency of Public Life mentioned in article 25 octies of law n° 83-634 of 13 July 1983 on the rights and obligations of civil servants.
- In the case of the retention of the 49% shareholding, when the authority to which the civil servant belongs considers that it cannot assess whether the civil servant is in a conflict-of-interest situation, it shall refer the matter to the High Authority for the transparency of public life, under the conditions provided for in Article L. 531-14.

## 2.5 The Netherlands' national strategy and regulations on academic spin-off creation

In 1999, the Dutch Ministry of Economic affairs published a paper stating that the number of high-tech start-ups in the Netherlands lags compared to other EU countries and the United States. Subsequently, initiatives were started to stimulate commercial exploitation of knowledge generated within universities. A specific initiative by the Dutch government in the area of the Life Sciences was the Biopartner programme. This was started in 2000 with the objective to enhance the business climate for start-ups in the Life Sciences (Dutch Ministry of Economic Affairs, 1999). Actions were directed toward increasing awareness, stimulating starters, establishing facilities like a seed fund and academic incubators, and promoting the commercialization of academic knowledge within universities. A few years later, the Technopartner program and the Valorisation Grant were implemented with similar instruments aiming at scientists in universities (Dutch Ministry of Economic Affairs, 2003).

As a follow-up to the above-mentioned programmes, a further clustering of activities has recently taken place in order to remove the sometimes-impeding borders between different regions. At the national level, the StartupDelta program has been launched. As from 2019, this program is runned by Techleap.nl<sup>41</sup>. TechLeap.nl helps to build the ecosystem for tech companies in the Netherlands, whether they be startups or scale-ups. It creates the optimal climate for tech companies to scale with programs and initiatives for improving access to capital, market and talent. Techleap.nl is making the Netherlands home for tomorrow's leaders in tech.

For Dutch entrepreneurs in the deep-tech sector, the growth from start-up to scale-up is not easy because they lack the experience, network and financing to take that step. In addition, there are few initiatives at national level that focus on supporting this growth phase. As a result, these entrepreneurs do not get the chance to ultimately make a real impact on the market. Therefore, in 2021 the Pole Position project was launched. Pole Position is a new and exclusive initiative to guide deeptech entrepreneurs from startup to scaleup phase. The initiators are Techleap and the local

<sup>41</sup> Techleap.nl, <[www.techleap.nl](http://www.techleap.nl)>. Techleap.nl is a non-profit publicly funded organisation helping to quantify and accelerate the tech ecosystem of the Netherlands. Empowering people and their tech companies to scale with programs and initiatives for improving access to capital, market and talent. [Accessed 29 Nov 2021]

incubators YES!Delft, UtrechtInc, Novel-T and Braventure. Partly due to the enormous international network of these parties, the participating start-ups will soon be in pole position to grow into a successful scale-up. It is the first time that multiple regional parties have collaborated with a national organization to ensure that the Dutch deeptech ecosystem receives the necessary support in the growth phase from start-up to scale-up. Each edition of Pole Position has a specific theme to connect the participants with a network that is as relevant as possible to them. While programs in the initial phase of a startup focus on knowledge transfer from experts, at Pole Position the emphasis is much more on learning from each other's experiences, based on the peer-2-peer philosophy. Experienced entrepreneurs, investors and healthcare experts provide input and open up a network. This creates a community that will benefit companies now and in the future. The first round of Pole Position starts in October with ten participating companies. This first edition is aimed at deep-tech start-ups in the medical sector (healthcare). It often takes a long time to get medical products on the market, making it extra difficult for entrepreneurs to grow. “We see that Techleap.nl forms a strong combination with local incubators. This results in a great network to help deeptech startups through their 'valley of death' and to put the Netherlands on the international map when it comes to a fast-growing deeptech ecosystem”, says Anne Strobos, Director Access to Technologies at Techleap. NL. Jorg Kop, managing director of UtrechtInc: *“As our startups reach the growth phase in their entrepreneurial journey, the role of the founders changes and their needs become more specific. These startups need access to the right level of specific and national support that we as local ecosystems cannot provide alone”.*

### 3. UNIVERSITIES' APPROACHES TO SPIN-OFF CREATION

#### 3.1. Eötvös Loránd University's approach to spin-off creation

##### 3.1.1 Overview of spin-off creation at ELTE

In ELTE, fifteen spin-offs have been created in total<sup>42</sup>. ImmunoGenes<sup>43</sup> is a success-story example of a spin-off creation at ELTE. ImmunoGenes is a biotech company with cutting edge technologies in discovering new antibodies by creating novel genetically modified laboratory animals showing improved immune response. Their goal is to support R&D of pharmaceutical companies and academics to improve their efficiency in identifying new therapeutic targets and therapeutic candidates. The management team is composed of doctors that are researchers at ELTE (the CEO, who is the founder of the spin-off, the Head of Antibody Discovery and the Head of Transgenic Discovery). The Founder and CEO received the title "Innovative Researcher of the year 2010" from ELTE<sup>44</sup>. Other researchers are conducting scientific consultancy for the enterprise. We can also mention the spin-off Maven 7<sup>45</sup>, of which CEO and CTO are both researchers and co-founders of the enterprise. Maven 7 is rooted in strong scientific and professional grounds. The methodologies developed and integrated into network analytics solutions are based on the scientific discoveries of the globally acclaimed and award-winning scientist co-founders. Another research professor at ELTE leading the development of a novelty in pharmacology co-founded Motorpharma Ltd<sup>46</sup>, a spin-off biotech company focusing on muscle research. They are ready to offer a first-in-class antispastic drug candidate, MPH-220, a possible next generation muscle relaxant with a new mechanism of action. The treatment of painful spasticity is an unmet need causing huge burden in neurological injury related diseases like poststroke conditions or chronic low back pain. The invention is patented in more than 40 countries and the contract signed by the university as patent co-owner has been a biopharma license agreement of the highest value so far in the Hungarian academic sphere.

Among others, these three examples underline that excellent scientific research conducted at ELTE can lead to outstanding innovation and spin-off or start-up creation for a brilliant and useful economic and social impact.

##### 3.1.2 Spin-off creation support organisation inside ELTE

Spin-off creation is one of the several potential ways of exploitation of scientific results and at ELTE it is the responsibility of the Centre for Innovation to support exploiting activities. In addition, ELTE's Policy on Intellectual Property Management emphasizes the role of spin-offs: "the regulation aims at supporting the basic activities of the University through the revenues made available through

<sup>42</sup> Figures from the survey filled by ELTE

<sup>43</sup> Immunogenes, <<http://www.immunogenes.com/content.php?c=Advisors&id=1>> [Accessed 29 Nov 2021]

<sup>44</sup> Az ELTE Innovatív Kutatói, <<https://www.elte.hu/content/az-elte-innovativ-kutatoit.10711>> [Accessed 29 Nov 2021]

<sup>45</sup> Maven 7, <<http://maven7.com/>> [Accessed 29 Nov 2021]

<sup>46</sup>New Drug candidate MPH-220 developed at ELTE: <<https://ttk.elte.hu/en/content/new-dimensions-in-the-treatment-of-muscle-spasticity-after-stroke.t.3851>> [Accessed 29 Nov 2021]

utilization and the benefits gained by the strengthening of corporate relations. To this end, it is to increase research and development activities in cooperation with market and state actors, encourage contractual forms of utilization and, should the given utilization process justify it, the form of an exploiting enterprise with a university share.”<sup>47</sup> Furthermore, there is an Innovation Lab at the Faculty of Informatics which helps start-up / spin-off projects, but for the whole university there is no incubator functioning yet. In recent years, however, several training courses on innovation and entrepreneurship, including start-up and spin-off creation practices have been launched at the university (Start-up course for ELTE students<sup>48</sup>, HSUP<sup>49</sup>), even specifically for non-business students (SIMpLe)<sup>50</sup>.

The Centre for Innovation provides researchers and their spin-offs with marketing support<sup>51</sup>.

There are several spin-offs who rent a lab at ELTE, thus the university provides them with space and infrastructure. If there is an issue raised that researchers want to exploit a particular intellectual creation through a spin-off, the University usually supports it to promote innovation and entrepreneurship by researchers. ELTE also submits consortium proposals in which the university participates together with its spin-off companies. The Centre for Innovation supports the communication of these enterprises (e.g. press breakfast is going to be an excellent new opportunity for this), but articles with related content have been published, as well. A publication entitled Innovation Success Stories is being planned, in which spin-offs could be mentioned among good examples. To a business breakfast held last September, one of the spin-off companies was also invited due to its related topic, and hopefully another collaboration will emerge from that. In addition, the Center for Innovation mainly provides spin-offs with advice if e.g. they have a question about an investor or on any other issue.

The evaluation of a so-called Mecenature grant proposal<sup>52</sup> is underway, which, if successfully implemented, will enable the Centre for Innovation to make the results of scientific and innovation excellence available to the general public. It also aims at strengthening citizen science through various media appearances. This would be reached by organizing regular press breakfasts and through podcasts promoting science and innovation, printed and electronic press releases and science communication publications. The target group is all the people (teachers, public administrators, NGOs, etc.) whose everyday life does not focus on innovation, but can still play an

<sup>47</sup> ELTE's Policy on Intellectual Property Management: [https://www.elte.hu/dstore/document/6793/ELTE\\_SZMSZ\\_15mell\\_szellemitulajdon.pdf](https://www.elte.hu/dstore/document/6793/ELTE_SZMSZ_15mell_szellemitulajdon.pdf) [Accessed 29 Nov 2021]

<sup>48</sup> Start-up course for ELTE students, <https://www.elte.hu/content/startup-kurzus-elte-seknek.t.12261> [Accessed 29 Nov 2021]

<sup>49</sup> Hungarian Start-up University Programme (HSUP) at ELTE, <https://gtk.elte.hu/content/indul-az-elte-n-a-hungarian-startup-university-program.t.15132> [Accessed 29 Nov 2021]

<sup>50</sup> SIMpLe Entrepreneurship and Innovation – practical master course for non-business students: <https://www.elte.hu/en/innovation/projects/on-going/simple> and <https://www.elte.hu/en/entrepreneurship-and-innovation> [Accessed 29 Nov 2021]

<sup>51</sup> From the survey filled by ELTE

important role in spreading a given innovation in practice, thus improving people's quality of life and well-being. Micro-enterprises and SMEs are also targeted, which themselves are not yet matured for innovative initiatives, but their sensitization is important for expanding the innovation ecosystem. This would also draw attention to spin-offs.

### InnoChange Project

Led by ELTE Faculty of Informatics, the consortium *"InnoChange: Driving Change and Capacity Building Towards Innovative, Entrepreneurial Universities"*<sup>53</sup> won the support of EIT Higher Education Initiative in July 2021. The project aims to increase the entrepreneurial and innovation capacity of higher education institutions through cooperation between European higher education institutions and industry. It highly focuses on the teaching of innovation and entrepreneurship and the support of such activities (startup, knowledge transfer, business utilization - from idea to exploitation) in the participating higher education institutions.

Its main tasks are:

- Developing a targeted curriculum, education of teachers and students;
- Training of "experts" dedicated to the scouting, follow-up and mentoring of innovative, commercially exploitable ideas (based on the institution's human resources, e.g. PhD students), assessment of the possibilities of utilizing ideas, building corporate networks;
- Encouraging student innovation (community platform, hackathon, etc.) - Startup Wise Guys, as a corporate partner, will act as an accelerator in connection with the startup ideas generated during the project.
- The primary task of associated business partners is to channel specific, business-driven research topics and situations into education, representing not only EIT Digital aspects but also those of EIT Health and EIT Food.
- The main activities of Phase 1 (July-December 2021) are curriculum development, training of other staff involved in the project, implementation of a pilot mini-course (autumn 2021), situation assessment, setting up an innovation service framework, etc.

#### 3.1.3 Rules on spin-off creation at ELTE

ELTE complies with the national regulation in framing institutional rules on spin-off creation. Firstly, if researchers plan to be only the owner of the spin-off or start-up, they do not have to be granted authorisation from their universities. However, if they plan to be employed in the spin-off or start-

<sup>53</sup> InnoChange project, <<https://www.inf.elte.hu/en/content/eit-hei-innochange-has-had-a-successful-project-launch-meeting.t.3411>> [Accessed 29 Nov 2021]



up, then being granted prior permission from the university is compulsory. Researchers can undertake several positions in a spin-off: funder, CEO, director, shareholder, associate or employee.

At ELTE, no statutory incentive or specific position is implemented to support researchers willing to create a spin-off for instance with working time arrangement or multiple jobholding. There is no set % to share time between the researchers' activities and the spin-off creation. Researchers at ELTE are public servants and their entry into the private sector, such as establishing an additional employment relationship, is regulated by law.<sup>54</sup> The additional work relationship cannot be incompatible with the researcher's work at the university and cannot be carried out in identical working time as his/her university work. However, as by the institutional regulation of ELTE the working time of a researcher is unrestricted, the concept of non-identical working time cannot be interpreted. For any additional work employment, the researcher needs to notify the university as his/her employer and to have its prior written consent.<sup>55</sup>

A commercialisation agreement must be negotiated between the university and the spin-off, with an agreement on financial conditions for the licensing rights of the IP (royalties, upfront, milestone payment).

### 3.1.4 Support to business creation provided by or in collaboration with external actors

On 3 October 2019, Eötvös Loránd University's Centre for Innovation, in cooperation with the Local Government of Újbuda, organised a conference and a start-up exhibition at the Lágymányos Campus of the university. Visitors were able to learn about the practical applications and the future of artificial intelligence at engaging educational presentations. In addition, several organisations and programmes supporting innovation were introduced. Also, the lecture series "Get started! Start a Business!" of the American Chamber of Commerce Hungary was brought to the university. There was an interactive roundtable discussion, as well as networking, and start-up exhibitions where local start-up companies could share their best practices.

## 3.2 Trinity College of Dublin's approach to spin-off creation

### 3.2.1 Overview of spin-off creation at Trinity College of Dublin

Trinity College Dublin is one of many academic institutions in Ireland serving as a hub for entrepreneurs, innovators and early-stage spin-offs. TCD is "*committed to fostering a culture of innovation and entrepreneurship across all disciplines*".

Trinity has produced more spin-off than any other Irish university, many of which have grown to be leading companies, such as Opsona, Havok, IdentiGEN, Iona Technologies<sup>56</sup>. Trinity now accounts

<sup>54</sup> Act XXXIII. of 1992 on the Legal Status of Public Servants, Section 41 (1) and 43 (1) <<https://net.jogtar.hu/jogszabaly?docid=99200033.tv>> [Accessed 29 Nov 2021]

<sup>55</sup> From the survey filled by ELTE

<sup>56</sup> Trinity Campus Companies, <<https://www.tcd.ie/innovation/industry/campus-companies/>> [Accessed 29 Nov 2021]

for one-fifth of all spin-off companies from Irish Higher Education Institutions. In the last five years Trinity has created over thirty-eight campus companies<sup>57</sup> across all the main sectors of medical devices, pharmaceutical and ICT. In total, more than 100 spin-offs have been created at TCD. On average five to six spin-off are created per year across all disciplines at TCD<sup>58</sup>.

Cellix<sup>59</sup> is an example of a spin-off creation success story inside TCD. Cellix was spun-out from Trinity College Dublin in 2006. The spin-off is composed of a multi-disciplinary team of engineers and scientists who have committed years of work developing microfluidic label-free impedance cell analysis and sorting. Over the years, they have expanded their product offerings supporting to customers in several therapeutic areas including thrombosis, oncology, atherosclerosis, inflammation, infectious diseases, biofilm culture, stem cell research, sickle cell disease, asthma, and allergies.

Trinity welcomes engagement with all the key components of the entrepreneurial eco-system including experienced entrepreneurs interested in a new business opportunity, angel and seed investors, the venture capital community and potential senior management.<sup>60</sup>

### 3.2.2 Spin-off creation support organisation inside Trinity College of Dublin

Within the Technology Transfer Office of Trinity College of Dublin, there is a dedicated spin-off development functions and dedicated licensing experts to support researchers in the process of spin-off creation, providing legal support and IP protection.

Trinity Research and Innovation and the Dean of Research also oversee spin-off creation support. TR&I manages innovation from concept stage to impact plus post spin-off support to campus companies. The Director of TR&I is responsible for the approval of TCD Company status. The Dean of Research shall endorse all such approvals.

The Company Registration Office (CRO) register all new spin-off created inside TCD.

Furthermore, a spin-off incubator space is in redevelopment.

TCD also offers business management support to researchers-entrepreneurs by introducing them to funders, teaching them how to present and negotiate their project, how to do a business planning, how to form a working team etc. In addition, TCD can support researchers in facility access and financing modelling and doing a capitalization table.

<sup>57</sup> "TCD Campus Company" means a company formed for the purposes of exploiting TCD IP, and is synonymous with the terms spin-out or spin-off. (TCD Policy, practice and Regulations on IP)

<sup>58</sup> Figures from the survey filled by ELTE

<sup>59</sup> We are Celix, <<https://www.wearecellix.com/>> [Accessed 29 Nov 2021]

<sup>60</sup> Trinity Research and Innovation, Trinity Campus Companies, <<https://www.tcd.ie/innovation/industry/campus-companies/>>, [Accessed 29 Nov 2021]



For marketing support, TCD engages in building various gateways to network groups (such as Trinity Alumni or Angel investors) for sharing experience and advising researchers involved in a spin-off creation process. TCD also engages in introducing researchers to business partners and customer for sale's strategy support.

### 3.2.3 Trinity College of Dublin's policy on spin-off creation

Spin-off creation process is followed case by case by the dedicated office inside Trinity. Positions that can undertake researchers inside a spin-off (Head, associate, employee, and shareholder) are discussed with the researcher's head of school.

To create a spin-off, researchers must follow a specific campus company approval process described in The Trinity Intellectual Property Policy and gather several documents to apply to the Campus Company Statute. TCD Campus Companies must register to the Company Registration Office<sup>61</sup>. A Conflict-of-Interest Declaration and an approval from the academic's Head of School must be issued and sign off provided by Trinity Research and Innovation. Applicant Company must provide the Director of TR&I with an acceptable business plan and a written certification that they will allocate equity to TCD as agreed. Applicants must also receive approval from the founder's Head of School to engage with the Campus Company. Upon receipt of the above, and after evaluation and acceptance of the business plan, the Director of TR&I shall sign a Letter of Agreement approving the Campus Company status. The company authorised signatory countersigns and the Dean of Research endorses the agreement. The Letter of Agreement must be signed by a designated authorised signatory in the Campus Company.

The Trinity Intellectual Property Policy introduces the policy, practices and regulations on IP that are also applicable for spin-off creation. Section 7, on New Venture Formation, underlines the following points :

- 7.1 Overview - *“TCD encourages the formation of new ventures to promote innovative, technology-based, job-creating, investable enterprises in Ireland. TR&I provides support, such as infrastructure and space, through appropriate property licensing arrangements, and facilitates Staff to support the running of Campus Companies, Start Ups and Spin Ins in accordance with their contracts of employment. Staff founders engaging with Campus Companies in their academic capacity, using TCD resources, should do so under the terms of an appropriate agreement, e.g. services, Consultancy or secondment agreement. TCD reserves the right to nominate an observer to the board of a Campus Company for an agreed period of time, typically for a 12-month period, commencing on Campus Company approval. If necessary, TCD may appoint a non-executive member to the board for a specific purpose.”*
- 7.3 Equity - *“TCD shall be allocated Equity in a Campus Company in recognition of the supports and ecosystem, provided by TCD and the State, that have underpinned the*

<sup>61</sup> Companies Registration Office, <<https://www.cro.ie/home>> [Accessed 29 Nov 2021]

*development of the Campus Company prior to incorporation. These supports range from, but are not limited to, infrastructure, facilities, services, Staff founders' salaries, State-funded research, business planning and commercial supports. Once TCD has been allocated Equity, TCD and/or TR&I have no role in determining the Equity allocated to a Staff founder but may guide the Staff founder in obtaining independent advice with respect to Equity allocation. The allocation of Equity to TCD is an independent transaction from the terms of any TCD IP licensing agreement as agreed between TCD and the Campus Company. The terms and conditions of Equity allocation shall be governed by a shareholder's agreement, as mutually agreed by TCD and the Campus Company”.*

Equity allocation is as follows: (i) TCD reserves the right to negotiate additional terms to ensure that fair and reasonable Equity is allocated to TCD to reflect the development and commercialisation status of the Campus Company and provision of TCD supports that have underpinned the Campus Company; (ii) TCD shall be allocated no less than five percent (5%) Equity in all Campus Companies; (iii) Equity can be allocated in the form of ordinary shares which may be fully-dilutable and/or shares bounded by value, time or an event; (iv) Equity shall be allocated as soon as possible after incorporation of the Campus Company”.

Regarding the licensing of TCD IP, TR&I and the Campus Company must conclude an appropriate commercialisation agreement. In the IP policy, it is noted *“TCD shall seek to ensure that licences of TCD IP to Campus Companies will maximise the level of knowledge transfer and will be on fair and reasonable commercial terms, in line with international best practice so as to avoid conflict of interest issues and potential infringement of State-Aid Rules. If TCD Inventors/Contributors of the TCD IP are shareholders in the TCD Campus Company, they may not be actively involved in negotiations on behalf of the company, in order to avoid a potential conflict of interest”.*

### 3.2.4 Support to business creation provided by or in collaboration with external actors

Enterprises-Ireland<sup>62</sup>, the government organization responsible for the development and growth of Irish enterprises in world markets, underlines that *“Spin-out companies need to have a supportive environment for the initial years of the company's existence”*. Enterprises Ireland funds business and bio-incubation centres on college campuses across Ireland which can provide an ideal environment for spin-out companies.

Several supports are available for entrepreneurs inside “Enterprise-Ireland”, that can be interesting for researchers-entrepreneurs looking for more support outside TCD:

- Business Expertise: Business Partners Programme: match with experience entrepreneurs interested in joining the spin-out company's management team.

<sup>62</sup> Enterprises Ireland, <<https://www.enterprise-ireland.com/en/>> [Accessed 29 Nov 2021]

- Business Intelligence: Market Research Center: access to premium business intelligence and market reports.
- High-Potential Start-Up (HPSU) Support: The Enterprise Ireland High Potential Start-Up Team works with the leading Irish technology start-ups spinning out of industry, college research and overseas entrepreneurs locating in Ireland. The HPSU Team provide advice, connections, feasibility assistance and investment to start-up companies with the potential to create jobs and export sales.
- Introductions to Private Investors: arrange meeting with potential private investors and venture capital investors.
- Enterprise Ireland hosts annual events for college researchers interested in commercialising their research such as Big Ideas Showcase which presents the spin-outs and commercial opportunities emerging from Ireland's higher education institutes. These events are attended by researchers, venture capitalists, angel and private investors, entrepreneurs, innovators, international and Irish business executives.
- Mentor network a help spin-outs and their promoters identify and overcome obstacles to spin-off creation, development and growth.

Furthermore, Trinity College of Dublin is involved in the “Grand Canal Innovation District Project”<sup>63</sup>. The Grand Canal Innovation District will be an Innovation Hub set to serve as a space for entrepreneurs, academics, early-stage start-ups and/or spin-off and innovation teams to convene. University Trinity College of Dublin will act as the anchor tenant physically located in the centre of the district. Trinity has a 5.5 acres’ campus at the heart of the Grand Canal neighbourhood for which it has ambitious redesign plans as an innovation campus. Grand Canal Innovation District will be an internationally leading innovation district for Ireland.

### 3.3 University of Barcelona’s approach to spin-off creation

#### 3.3.1 Overview of spin-off creation at UB

Over the last twenty years, the Foundation Bosch i Gimpera has participated in the creation of more than forty-five spin-offs. Thirty-seven spin-offs have made use of the University of Barcelona’s technologies. Currently, twenty spin-offs are active. Last year, in 2020, four spin-offs were created at the University of Barcelona and twenty-two entrepreneurial projects have been advised. Several spin-offs are looking for capital to develop.

Biocontrol Technologies<sup>64</sup> is an example of a successful spin-off created inside the University of Barcelona that was founded in 2005. Biocontrol Technologies develops and offers efficient and sustainable biological solutions to farmers which control diseases in crops. Biocontrol Technologies

<sup>63</sup> Grand Canal Innovation District, <<https://www.tcd.ie/innovation-district/>> [Accessed 29 Nov 2021]

<sup>64</sup> Biocontrol Technologies, <<https://biocontroltech.com/>> [Accessed 29 Nov 2021]

has developed, patented and registered the T34 Biocontrol<sup>®</sup>, a biological alternative to agricultural practices which depend on chemical products. It is a product approved by authorities which is commercialised with different formulations and applications.

Catalonia has become a leading biotechnological region thanks to the contribution of its business network and the research institutions that work there. The cooperation between business and academia constitutes a wellspring of possibilities, generating employment and quality products and services which, in the final analysis, benefit society as a whole<sup>65</sup>.

Another success story of spin-off creation inside the University of Barcelona is the set-up of the spin-off Oryzon<sup>66</sup>, launched in 2000. Oryzon is a public clinical stage biopharmaceutical company and the European leader in the development of epigenetics-based therapeutics, with a strong focus on personalized medicine approaches to CNS disorders and oncology. The University of Barcelona, the Bosch i Gimpera Foundation and the Spanish National Research Council helped Oryzon's founders to develop a business plan which originally located the company in Barcelona's Science Park. Today Oryzon is one of the biggest biotech ventures in both Spain and Portugal. In December 2015, the company has been listed on the Spanish Stock Exchange. Since then, the company has attracted specialized investors from US, Israel and Europe in several PIPEs led by different US investment banks. Oryzon has opened a branch in the United States.

### 3.3.2 Spin-off creation support organisation inside the University of Barcelona

#### a) Foundation Bosch i Gimpera

At the University of Barcelona, the Foundation Bosch i Gimpera is responsible for spin-off creation's support. The foundation promotes the creation of innovative companies and foster their growth and consolidation. The foundation aims at improving business ideas and minimizing the risks of entrepreneurship for researchers.

Foundation Bosch i Gimpera offers opportunities for investors and mentors to participate in the creation and consolidation of innovative companies in University of Barcelona. Investors can contribute to foster new projects through funding. Mentors can use their expertise in a specific field or in business management to support researchers-entrepreneurs. The foundation keeps investors updated on capital-seeking companies. On the website of the Bosch i Gimpera foundation, researchers can easily find an infographic explaining the applicable law for enterprise<sup>67</sup>. It is also easy for researchers to have access to information on funding opportunities.

The University of Barcelona has created the Fund for the Promotion of Innovation (F2I) through the Bosch i Gimpera Foundation. The Fund is an initiative designed to foster the innovation and transfer

<sup>65</sup> Senesciència number 4, *The University Spin-off*, <<http://www.ub.edu/senesciencia/noticia/university-spin-off/>> [Accessed 29 Nov 2021]

<sup>66</sup> Oryzon, <<https://www.oryzon.com/en>> [Accessed 29 Nov 2021]

<sup>67</sup> Bosch i Gimpera, Business Creation, <<http://www.fbg.ub.edu/en/what-we-do/business-creation/>> [Accessed 29 Nov 2021]

activities carried out by the researchers of the University of Barcelona. Two grants/programmes are available<sup>68</sup> :

- The Proof-of-Concept grant aims to fund proofs of concept that improve the opportunities for exploitation of the research results generated at the university, and to valorise research projects with a high potential for transfer. Proof of Concept grants will advance the maturing of the selected technologies with the aim of bringing them closer to market requirements and enabling their transfer via licensing to an existing company or through the creation of a new spin-off.
- The Mentor in Residence programme is promoting the creation of new spin-offs of the University and helping the development of those recently established by providing the funds to hire a mentor specialized in managing business projects. The programme aims to provide the funds to supplement the entrepreneurial team by making it multidisciplinary.

#### b) StartUB!

Additionally, StartUB!<sup>69</sup> is the entity of the University of Barcelona responsible for coordinating, promoting and developing all activities related to entrepreneurship and its promotion for professors, researchers, students, alumnis. It is an incubation and meeting place for people part of the entrepreneurial ecosystem.

StartUB! works on the basis of four values:

- Innovation
- Creativity
- Sustainability
- Equality

To integrate one of the StartUB! Programmes and trainings sessions presented hereunder; students and researchers must comply with the following conditions:

1. They aim at establishing their project as a company in the near future.
2. Is a company derived from the University of Barcelona (spin-off) less than two-years-old.
3. At least one of the team members must be a UB alumni, or have participated in StartUB! Program.

<sup>68</sup> Bosch i Gimpera, F2I, <<http://www.fbg.ub.edu/en/news/the-university-of-barcelona-opens-new-line-of-funding-to-promote-the-innovation-and-transfer-activities-carried-out-by-its-researchers/>> [Accessed 29 Nov 2021]

<sup>69</sup> StartUB!, <<http://www.ub.edu/startub/en/>> [Accessed 29 Nov 2021]

By integrated StartUB!, researchers have access to a free workplace, mentoring and a network.

StartUB! offers Strategic, Management and Marketing support to entrepreneurs through specific programmes. Researchers involved in a spin-off creation process can follow these trainings. Four programmes are available, that correspond to the different stages of the process of spin-off creation:

- The Learning Phase with the “Ideate” and “Validate” programmes
- The incubation Phase with the “Launch” and “Accelerate” programme

1) The Ideate programme<sup>70</sup> is composed of trainings in basic concepts of innovation and entrepreneurship. This program is more focused on student’s entrepreneurship, that we will address in WP5’s fourth Report: “*Students’ entrepreneurship support method*”.

2) The Validate programme<sup>71</sup> focuses on the process of validating a business idea and analysing if this idea represents a business opportunity. Short training modules are offered across all faculties and related institutions of the University. The program Science to Market specifically aims to promote scientific entrepreneurship and provide doctoral students and researchers with the necessary tools to explore the possibility of creating a research-derived company.

3) The Launch Programme<sup>72</sup> aims to cover the initial stage of project development up to the establishment of spin-off or companies. It consists of different programmes which provide training and support from mentors. This program is divided in two training activities :

- The StartUB! Sprint<sup>73</sup> : Two editions are organised per academic years. For four months, entrepreneurial teams in different stages of development of their projects, or up to one year after the creation of companies, have access to experts’ support to progress on their project. This activity is dedicated to students.
- Explorer<sup>74</sup> activity: this initiative also aims at researchers “*who want to turn their discoveries into sustainable businesses*”. Explorer is a twelve-weeks programme during which entrepreneurs can work on their idea and to turn it into a solution contributing to achieve one or multiple 2030 Sustainable Development Goals. Through this session, entrepreneurs have access to the help of a coordinator that accompanies them, of a mento, to digital content, online sessions with leaders from the entrepreneurship’ world and an online workspace.

<sup>70</sup> StartUB!, *Ideate*, <<http://www.ub.edu/startub/en/programmes/discovery-track/>> [Accessed 29 Nov 2021]

<sup>71</sup> StartUB!, *Validate*, <<http://www.ub.edu/startub/en/programmes/validation/>> [Accessed 29 Nov 2021]

<sup>72</sup> StartUB!, *Launch*, <<http://www.ub.edu/startub/en/programmes/launching-platform/>> [Accessed 29 Nov 2021]

<sup>73</sup> StartUB!, *StartUB! Sprint*, <<http://www.ub.edu/startub/en/startub-sprint/>> [Accessed 29 Nov 2021]

<sup>74</sup> StartUB!, *Explorer*, <<http://www.ub.edu/startub/en/explorer/>> [Accessed 29 Nov 2021]



4) The Accelerate programme<sup>75</sup>, the last phase of StartUB!, aims at accelerating innovative initiatives which have the potential to become successful start-ups and/or spin-off. This programme encompasses three training activities :

- The Consolidate Programme, aimed at entrepreneurs, supports the consolidation, strengthening and reinvention of self-employment.
- BoostUB – Health, offers training, mentoring, access to an incubation space, contact with companies and investors in the sector, and collaboration with graduate students of ten startups in the health and nutrition sector.
- Bridgehead Europe/Global brings together European health entrepreneurs who want to grow their business beyond their home market with Europe's leading incubators and accelerators that have the expertise and resources to make it happen.

On StartUB! Website, there is a page dedicated to useful tools for entrepreneurs such as apps, videos, websites with resources for business model, project management, for example.

### 3.3.3 UB's policy on spin-off creation

At the University of Barcelona, researchers must refer to their employer to create a spin-off. Without authorisation, they cannot reduce their working time at the university to focus on the spin-off creation. Researchers-entrepreneurs have the same obligations as other researchers. There are no privileges for them, nor specific distribution of time to allow them spending some of their working time on the spin-off creation<sup>76</sup>.

If requested, researchers can become employees of the spin-off once created, by taking a part-time job, which in any case can imply a reduction of their dedication to the University tasks. Researchers can also request to leave the University for a certain period to work for their enterprise.

Researchers must provide a business plan analysing the market niche and a clear development plan. Once the licensing terms and conditions are negotiated with the University of Barcelona, the project can then be presented to the Social Council at first and to the Research Commission. Afterwards a meeting is held to assess whether the University participates or not. Then other administrative procedures must follow for approval: the plenary session of the Social Council and the plenary session of the Governing Council.

<sup>75</sup> StartUB!, Accelerate, <<http://www.ub.edu/startub/en/programmes/acceleration-program/>> [Accessed 29 Nov 2021]

<sup>76</sup> Data from the survey filled by UB

### 3.3.4 Support to business creation provided by or in collaboration with external actors

In Catalonia, Xarxa Emprèn<sup>77</sup> is a network of public-private bodies that provide support services to people willing to create an enterprise in Catalonia during the first three years of the professional life, in the framework of the program “Catalunya Emprèn” of the Catalonia Generalitat.

Multiple funds are also available to support entrepreneurs to create their start-up and/or spin-off.

- The Institut Català de Finances (ICF) is a public institution that finances entrepreneurs through a wide range of financial products and instruments.
- The association of business angels' networks of Spain gather business angels interesting in investing in new startups.
- Seed Capital invests in internet startups and innovative technology companies.
- Inveready is a leading asset manager in Spain investing in early stage technology based companies.
- Venture Cap invests in both startups and companies in the growth phase.

## 3.4 University of Montpellier's approach to spin-off creation

### 3.4.1 Overview of spin-off creation inside the University of Montpellier

At the University of Montpellier, multiple researchers have participating in the creation of spin-off valorising UM' research results through Scientific Consultancy. Since the merger of the universities UM1 and UM2 into University of Montpellier in 2015, an average of thirty-four spin-off have been created inside the University of Montpellier. Yet, the university has no indicators to properly monitor these figures. Thus, this number should be considered as a potential average, but does not accurately reflect the situation. The number of thirty-four spin-off creation has been declare to the Curie Network' questionnaire by the UM in 2021.

For interviewed French researchers at UM, creating a spin-off is not the first solution that comes naturally to their mind when they aim at valorising and commercializing research results. Firstly, they go for licensing or material transfer, as it is less time-consuming and a more classical way of valorising research. However, research valorisation is part of universities' mission and of academic researchers' objectives. Some of UM researchers have succeeding in creating renowned companies. The spin-off “Acusurgical”<sup>78</sup> is a recent success story. A researcher has associated with an entrepreneur to create the company commercializing a robot for retinal surgery. The entrepreneur is the CEO of the spin-off, and the researcher is doing scientific consultancy. This facility, still under development, is unique in the world and will allow more surgeons to perform operation on elements

<sup>77</sup> Xarxa Emprèn, <<http://xarxaempren.gencat.cat/es/inici/index.html>> [Accessed 29 Nov 2021]

<sup>78</sup> Acusurgical, <<https://acusurgical.com/fr/accueil/>> [Accessed 29 Nov 2021]



of the size of a single hair. This spin-off has won the I-lab competition prize in 2020 with a funding of 270 000 euros to pursue its development. Acusurgical has also succeeded in raising 5.75 million to fund clinical trials. Furthermore, the spin-off has signed a partnership with the Hospital Rothschild Foundation.

Two other recent success stories can be underlined at the University of Montpellier:

- The company Neurinnov SAS<sup>79</sup>, an INRIA and Montpellier University spin-off founded in 2018 focuses on designing, developing and commercializing Active Implantable Medical Devices.
- The company Neocean<sup>80</sup>, commercializing the Overboat, an electric hydrofoil boat.

Other success stories of spin-off creation can be found on the website of the University.

### 3.4.2 Spin-off creation support organisation inside the university

At the University of Montpellier, the Contracts and Valorisation Office of the Partnerships and Innovation Department provides legal support to researchers involved in a spin-off creation process and work in close relation with the SATT AxLR which provides incubation support to spin-off for researchers willing to valorise their research results through spin-off creation. Thus, the first step for researchers willing to create a spin-off is to contact the Contracts and Valorisation office to analyse the project and discuss the possibilities of spin-off creation.

Researchers must fill in an application with the support of valorisation's officers and may conclude a valorisation' contract with the SATT AxLR. If researchers wish to benefit from articles 25.1 and 25.2 facilities/pathways, a technology transfert contract must be concluded (not applicable for article 25.3). If the SATT AxLR does not want to invest in a project, then the Contracts and Valorisation Office must realise the technology transfer to the company.

The university can refer to the Consultative Commission on Research Ethics about applications, but the President is the one who gives the final agreeing to the researcher's request.

Some components of the University of Montpellier have developed initiatives to boost innovation among students, staff, researchers and entrepreneurs. For instance, the IUT Montpellier-Sète has created "Ob.i LAB<sup>81</sup>". Ob.i LAB is a space inspired by the international network of FABLABs, places where all sorts of manual and digital tools are available for designing and making objects. They allow people to bring their projects to life and to have the pride of being able to make them themselves or with others (the "Do It Yourself" movement). The lab is open to the professional world:

<sup>79</sup> Neurinnov, <<https://neurinnov.com/>> [Accessed 29 Nov 2021]

<sup>80</sup> Neocean, <[https://overboat-by-neocean.fr/?src=google-ads&gclid=CjwKCAjw7rWKBhAtEiwAJ3CWLCHxHBlT72w3giN3ifX3ijqImbfzE2z1wNtC90cj3P8ZuFcwSAIOVBoCqYUQAvD\\_BwE](https://overboat-by-neocean.fr/?src=google-ads&gclid=CjwKCAjw7rWKBhAtEiwAJ3CWLCHxHBlT72w3giN3ifX3ijqImbfzE2z1wNtC90cj3P8ZuFcwSAIOVBoCqYUQAvD_BwE)> [Accessed 29 Nov 2021]

<sup>81</sup> I.U.T Montpellier-Sète, *O.bi LAB, espace de fabrication numérique*, <<https://iut-montpellier-sete.edu.umontpellier.fr/obilab/>> [Accessed 29 Nov 2021]

entrepreneurs, artists, researchers, or tinkerers can come and build their ideas to move more quickly from the concept phase to the prototyping phase.

In addition, the University of Montpellier is part of the consortium Montpellier University of Excellence (MUSE)<sup>82</sup>, gathering multiple partners. The consortium has developed multiple tools and trainings dedicated to entrepreneurship plus a network of experts in innovation to support researchers-entrepreneurs. The MUSE support teams can accompany researchers in the different phases of their project (teams' formation, business model, IP, funding sources, networking etc.). The MUSE consortium works in close collaboration with external actors, for example with the Business and Innovation Centre of Montpellier (BIC) or the Occitanie regional Agency for economic development AD'OCC<sup>83</sup>.

Spin-off supports involves raising awareness on innovation, workshops for researchers to understand how to better structure, present and pitch their innovative ideas in an intelligible, precise and concise manner for non-experts. Researchers can also be involved in accelerating coaching to boost their project.

MUSE consortium is also involved in a working group on the subject of incubation in order to work on and find solutions to operational problems that may appear during incubation or to develop incubation offer.

MUSE has developed "Companies on Campus", a call-for-projects dedicated to developing new partnerships between companies and research laboratories involved with MUSE. The goal is to make it easier for company staff to set up directly in the research laboratories. Companies on Campus encompasses the arrival of new company employees and leaders of start-up and/or spin-off projects benefiting from incubation services. Hosting companies in facilities close to researchers and students for a minimum period of six months is a way to overcome the logistical conditions that may often be a barrier for those types of projects. Being able to work closely with partners on topics of mutual interest is a factor that favors deeper and longer-term partnerships.<sup>84</sup> The jury of Companies on Campus selecting projects that will receive funding and hosting is composed of scientific experts to judge the scientific program of the project, innovation and valorisation experts to judge the socio-economic aspect of the project. The jury also tries to prevent and detect all potential conflicts of interest. Since 2018, three sessions of Companies of Campus have been organised, with several "waves" in each session, with a total of twenty-six projects supported.

In addition, the Booster of Innovation Montpellier<sup>85</sup> is an event organised by MUSE, dedicated to innovation projects' leaders that have a project with a low Technology Readiness Level (TRL) and

<sup>82</sup> Montpellier University of Excellence, <<https://muse.edu.umontpellier.fr/>> [Accessed 29 Nov 2021]

<sup>83</sup> AD'OCC, <<https://www.agence-adocc.com/>> [Accessed 29 Nov 2021]

<sup>84</sup> MUSE Montpellier Université d'Excellence, Companies on Campus : les 5 premières collaboration de recherche innovantes, <<https://muse.edu.umontpellier.fr/2018/11/13/companies-on-campus-les-5-premieres-collaborations-de-recherche-innovantes-primees-dans-les-laboratoires/>> [Accessed 29 Nov 2021]

<sup>85</sup> Montpellier University of Excellence, *Booster Innovation Montpellier*, <<https://muse.edu.umontpellier.fr/partenariat/chercheurs/bim-2/>> [Accessed 29 Nov 2021]

that are not very aware of their possibilities and/or do not have a deep knowledge of the local innovation ecosystem. This two-day event allows researchers that have a simple idea, an ongoing research project or the will to create an enterprise to participate in reflections on diverse subjects on innovation. Support is provided for researchers, to help them structure their ideas, during workshops. Researchers can also have access to coaching. This event helps researchers in upscaling their ideas and projects and give them first insights, advices and support for enterprises' creation. On completion of this event, all researchers see their projects supported in accordance to their current needs (research collaboration, research transfer or spin-off creation). Moreover, financial resources can be granted to some projects with innovation potential. At the end of each BIM event, a satisfaction questionnaire is filled up by attendants in order to collect their feedback and better understand their needs and expectations to improve the support provided.

MUSE' team works in close relation with the administrative agents of the Contracts and Valorisation Office of the Innovation and Partnerships Department in order to find common solution and improve the support offer to researchers willing to be involved in a spin-off creation process.

### 3.4.3 UM's policy on spin-off creation

The University of Montpellier has set up its own Consultative Commission for Research Ethics since the 9<sup>th</sup> of March 2020. This commission oversees formulating preparatory recommendations regarding authorisations for researchers' mobility between public research units and the private sector. It is not compulsory for universities to create a Consultative Commission for Ethics; each institution manages spin-off creation support in its own manner. At the University of Montpellier, the Consultative Commission for Research Ethics meets every month or every two months, according to the number of files to be processed. The Human Resources Department and the Partnerships and Innovation Department participate in the Ethics Consultative Commission, composed by the Ethics referent, The Delegated Vice-Rector to Valorisation and Industrial Partnerships, and the Vice-Rector for Research. The manager of the contracts and valorisation office also attend the meeting with the three valorisation' officers and provide their expertise on the applications.

Researchers must refer to their employer (the university) to create a spin-off and obtain the authorization of the University's President. The Consultative Commission for Research Ethics gives a consultative opinion to help the President takes his decision. Researchers can undertake one of the statutory positions previously introduced and choose to refer to article 25.1, 25.2 or 25.3 of the Law of Research and Innovation.

The University of Montpellier edits an annual booklet of the Consultative Commission's decisions. The Consultative Commission considers that from 20% of the researcher's time dedicated to the scientific activity of the enterprise, this is a part-time position and thus the researcher must be placed in provision or delegation. More precisely, the company hosting researcher providing scientific consultancy should only reimburse the salary costs of the researcher if the time spent at the company is no longer compatible with a full-time position for the researcher in his or her public

service. Thus, the Consultative Commission recommends maintaining the rate of 20% (which is retained in the jurisprudence of the former National Commission for Research Ethics). The researcher may work 100% for the UM and up to 20% in addition to his or her working time within the company to provide scientific consultancy. Beyond 20%, the researcher is placed under delegation to the company and the company must reimburse the salary costs beyond 20%.

A contract must be signed between the University and the spin-off to deal with licensing IP rights, financial royalties:

- For situations referring to article 25.1, a technology transfer contract must be concluded between the University of Montpellier and the co-owner of the society.
- For situations referring to article 25.2, a technology transfer contract must be concluded between the University of Montpellier and the co-owner of the society. In addition, a convention of scientific consultancy must be signed between the employer and/ co-owner of the technology and the enterprise. The convention plans:
  - The remuneration of the researcher providing scientific consultancy
  - The amount of time the researcher spends in the company
  - The reimbursement from the company to the employer for the time spent by its research staff.
- For situations referring to article 25.3, no specific convention must be signed.

In terms of IP clauses, scientific consultancy is not intended to result in inventive activity. However, if the researcher develops an inventive activity, the IPR belongs to the university. If, during a scientific consultancy period, research work has to be carried on, the researcher and the enterprise must conclude a collaborative research contract fixing IP management and research results' valorisation conditions. In the scientific consultancy convention, co-ownership of new results is planned. Scientific consultancy conventions and delegation must be consistent on IP clause.

#### 3.4.4 Support to business creation provided by or in collaboration with external actors

The University of Montpellier has signed an Incubation Charter in the framework of MUSE and offers temporary occupation of public space for companies/start-ups according to articles D. 123-2 to D.123-8 of the Education Code, relating to the conditions under which public scientific and technological establishments and higher education establishments may provide operating facilities to companies or individuals. Indeed, developing strategies and policies for supporting start-up and/or spin-off creation is one of the main objectives of the MUSE consortium<sup>86</sup>. The incubation

<sup>86</sup> Montpellier University of Excellence, *Charte d'incubation et d'hébergement de l'I-SITE par l'UM*

charter introduces a common methodology for all MUSE' partners to support start-ups' and spin-off incubation and hosting process.

The city of Montpellier and Montpellier Méditerranée Metropolis form a very dynamic environment for economic development and innovation. Support to spin-off creation is externalized to the SATT AxLR<sup>87</sup> or to start-up incubators.

#### a) SATT AxLR

The SATT AxLR is a key player in Technology Transfer and spin-off incubation in the Montpellier area. The valorisation office of the University of Montpellier works in collaboration with this accelerator to support spin-off creations by UM' researchers. The SATT AxLR aims at supporting an audience distanced from entrepreneurship (researchers), create a link between the world, the spirit and the time of research and the ones of start-ups and spin-off<sup>88</sup>. *“AxLR’s role is to support projects with strong innovation and application potential derived from public-sector research establishments in the Mediterranean area of France’s Occitanie region. AxLR assists them in bringing their developments to market.”*

In the last five years, SATT AxLR has launched 120 innovation programmes, invested 30 million of euros, and supported fifty start-ups and/or spin-off by granting financial resources. Each year, the SATT AxLR evaluates a hundred of entrepreneurial projects and supports and finances fifteen to twenty of them.

Maturation officers can visit research laboratories to detect innovations (among them the University of Montpellier). They are in contact with researchers to support them in the development of the technology and fund the maturation phase to develop the innovation. The accelerator offers to researchers interesting funding that is easily accessible. To do this, the maturation officer contacts the partnership departments of public institutions so that they can set up and fill in an invention disclosure form. Then, this invention disclosure form is presented in front of the IP committee gathering the SATT AxLR and its shareholders (among them the University of Montpellier). Discussion is carried out to choose which kind of transfer must be done to valorise the research. One of the options can be to create a spin-off derivate from the UM research results. This spin-off can be incubated at the SATT AxLR and have access to financial support.

Thus, SATT AxLR offers a variety of services to meet the needs of every project:

- Evaluation, formalization, and organization of researchers' projects
- Preparation and follow-up on scientific collaborations
- Advice and orientation on technical, legal, and business aspects

<sup>87</sup> SATT AxLR, <<https://axlr.com/>> [Accessed 29 Nov 2021]

<sup>88</sup> Interview of a start-up manager at SATT AxLR

- Strategic assistance for project leaders/directors
- Communication strategy
- Hosting solutions adapted to projects
- Financial support to cover expenses related to the incubation phase
- Help to seek funding and prepare fund raising

Montpellier University of Excellence' research laboratories represent 50% of the research laboratories supported by the SATT AxLR i.e. an average of one hundred research units.

In addition, the SATT AxLR has developed an incubation programme to support deep-tech start-ups and/or spin-off with project of high-level of maturation: the TTM Factory for Deep Tech Project<sup>89</sup>. This incubation programme is research and business-focus and last twelve to twenty-four months. The programme focuses on commercial development, placing on the market and access to investors. The objective of the incubation phase is for researchers-entrepreneurs to learn how to generate money.

The SATT AxLR can also propose co-incubation to researchers' spin-off. This co-incubation can be initiated in two ways :

- Other local incubators hosting spin-off and/or start-ups with specific needs in link with research contact the SATT AxLR for initiating co-support.
- The SATT AxLR detect a specific need from its incubated spin-off and/or start-ups and contact one qualified local incubator to initiate co-support.

Researchers can also have other needs. Indeed, some of them do not have the time or the will to create the spin-off themselves. In this situation, they can associate with entrepreneurs. The entrepreneur will be the CEO of the spin-off and deal with all the business, administrative, legal and financial sides of the spin-off creation. The researcher will focus on scientific and technological advancements, for instance through scientific consultancy. Thus, the SATT AxLR is working on finding CEOs and teams that are interested in creating a spin-off in collaboration with researchers, through the creation of networks of entrepreneurs. Managing to raise the interest of entrepreneurs to create enterprises based on high technology and scientific research results is an activity currently under development at SATT AxLR and constitutes a big challenge, even at the national level.

## b) Start-up incubators

There are multiple start-up incubators in the Montpellier Méditerranée Metropolis area, each of them being specialized on a certain field or subject, or on specific type of start-up, for instance on

<sup>89</sup> TTMFactory, <<https://ttm-factory.com/>> [Accessed 29 Nov 2021]



deep tech start-ups. The most renowned is the Montpellier Méditerranée Métropole Business and Innovation Centre (BIC)<sup>90</sup>, an exceptional advisor and catalyst for innovative companies, internationally recognised. BIC is at the heart of an innovative network, accelerating the creation and emergence of innovative companies and stimulating their growth. Ranked as the second-leading start-ups incubator in the world in 2018 and in the TOP 5 in 2019 by UBI Global, a Montpellier French Tech partner, BIC propagates Montpellier's expertise in assisting innovation. Since its creation, more than 800 company creations have been assisted and more than 170 enterprises 'projects are currently incubated.

Several programs and training are available at the BIC:

- Effective assistance programs with an individual coaching to learn how to target the market, elaborate a business model, plan the development phases, and fine-tune the financial strategy.
- Jump'in creation is a five-week program that alternates between group workshops and individual meetings with innovation experts.
- High-performance tools: the "Montpellier Business Plan" offers a complete method for forecasting business activities.
- Dedicated facilities. Entrepreneurs can set up their company at one of the three incubation sites.

### 3.5 Utrecht University's approach to spin-off creation

#### 3.5.1 Overview of spin-off creation in Utrecht University

In the last twenty years, multiple companies have started from Utrecht University and/or the University Medical Centre Utrecht with the assistance of Utrecht Holdings BV.

As from 1998, on average fifty-five companies have been founded. The current portfolio is about forty participations taken in start-ups. On average three spin-offs are created annually.

MILabs<sup>91</sup> is a spin-off success story at UU. The company was founded in 2006 as a spin-off from the University Medical Centre Utrecht. Today, a whole new line of molecular imaging systems with unsurpassed resolution has been developed which has received many international awards from the scientific community, supports many happy users worldwide and serves as the imaging platform for important discoveries in the fields of pharmacology, oncology, cardiology and neuroscience. Recently, Milabs was acquired by Rigaku Corporation (Japan).

<sup>90</sup> Montpellier Méditerranée Métropole, *BIC Business and Innovation Center*, <<https://www.bic-montpellier.com/fr>> [Accessed 29 Nov 2021]

<sup>91</sup> MILabs, <<https://www.milabs.com/>> [Accessed 29 Nov 2021]

Bimini Biotech<sup>92</sup> is another example of an innovative spin-off of the University Medical Centre Utrecht. The spin-off is one of the winners of the 2020 Academic Start-up Competition in the Netherlands. Bimini Biotech develops innovative therapeutic strategies for major unmet medical needs. The spin-off combines young entrepreneurs, leading scientists and seasoned biotech business experts.

A number of appealing companies have also been established outside the Life Sciences domain:

UCrowds<sup>93</sup> is a company bringing crowd simulation to everyone while keeping it easy to understand and use. Whether you want to use SimCrowds as an expert, seek projects with our linked experts or look for a technical crowd simulation challenge, we are here to deliver the best solution. They offer a software solution for simulating crowds in big infrastructures, events or virtual worlds. Their ambition is to contribute to a safer and more pleasant world. The team hopes to achieve this by bringing their state-of-the-art simulation systems and logics to everyone by thinking from a user perspective.

Dialogue trainer<sup>94</sup> offers online simulations that fully match proven effective conversations in your organization. The product and services help users to develop insight into the best conversation approach and to start important, real-life conversations with more confidence. Take, for example, bad news conversations in a business setting or in the context of a doctor-patient relationship. With these tools, those conversations can be excellently prepared and trained.

For a complete overview of all spin-offs, please visit the Utrecht Holdings website.

### 3.5.2 Spin-off creation support inside the university

#### a) Utrecht Holdings

Since 1998, Utrecht Holdings<sup>95</sup> has been investing in promising spin-offs that aim to commercialize excellent research from Utrecht University and UMC Utrecht. UH provides legal support for researchers willing to create spin-offs. UU core activities include screening and scouting of promising research, advising on knowledge utilization, grants and consortium building, early-stage market, business and legal advices, Intellectual Property protection and licensing, controlling UU patents, leading the formation of new companies, including legal and financial structuring, providing investment capability, Life science incubator and housing facilities.

UH currently manages two active funds:

- Utrecht Holdings Fund

<sup>92</sup> Bimini BioTech, <<https://biminibiotech.nl/>> [Accessed 29 Nov 2021]

<sup>93</sup> UCrowds, <<https://www.ucrowds.com/>> [Accessed 29 Nov 2021]

<sup>94</sup> Dialoguetrainer, <<https://www.dialoguetrainer.com/en/about-us/>> [Accessed 29 Nov 2021]

<sup>95</sup> Utrecht Holdings, <<https://utrechtholdings.nl/>> [Accessed 29 Nov 2021]



- Utrecht Health Seed Fund

Investments are determined by Utrecht Holdings investment committee, based on an assessment of the investment proposition, which includes at least a feasible and attractive business plan, team and IP position.

Utrecht Holdings uses a national set of Guidelines Dealing with Intellectual Property Rights (IPR)<sup>96</sup> regarding academic spin-off. The aim of this Set of guidelines is to clarify for academic spin-off the principles that govern their access to the IPR of public research organisations.

#### b) UtrechtInc

UtrechtInc<sup>97</sup> started in 2009 and is a top-ten university-linked incubator in the world. UtrechtInc has supported 259 spin-offs. The rate of active or acquired spin-off after five years of existence is 60%. It has developed a blog<sup>98</sup> with many advises for researchers setting up academic spin-offs.

UtrechtInc proposes access to network, community and mentors plus Validation programmes, focused on bringing the idea to the market, and one Acceleration Program, to support the growth of academic spin-off.

- Validation programmes :

(1) For science-based spin-off: a free and part-time ten-month programme consisting of:

- The Introduction phase: two weeks during which science-based spin-off jointly work on masterclasses, gain practical experience with entrepreneurial skills and engage in team building activities for three to four days per week.
- The Continuation phase: during the rest of the program, researchers spend one to two mornings and/or afternoons per month on either a masterclass or a progress session. Next to that, mentors are introduced who can give personalized advice and guide researchers through each step of the research validation journey.

(2) For tech-spin-off: a ten-week programme to work on the value proposition. The masterclasses are structured around experiences from other entrepreneurs and are supported by experienced experts in spin-off entrepreneurship, pitching, customer discovery, and product development. An extensive network of 150+ mentors, investors, and partners, supports researchers during the programme.

<sup>96</sup> Set of Guidelines Dealing with Intellectual Property Rights (IPR) For academic start-ups, VSNU, NFWO, KNAW and NWO (July 2016), <<https://utrechtholdings.nl/academics/policies/>> [Accessed 29 Nov 2021]

<sup>97</sup> UtrechtInc, <<https://utrechtinc.nl/>> [Accessed 29 Nov 2021]

<sup>98</sup> Utrechtinc Blog, Inspirational stories and practical tips, <<https://utrechtinc.nl/blog/>> [Accessed 29 Nov 2021]

- Acceleration programme :

A financial contribution is requested from the spin-off for this program. Applicants for the accelerator programme pay approximately 1500 euros per team. In case the researchers' spin-off goes sky-high, UtrechtInc asks for a success fee depending on revenue, over years three, four and five after participating in the programme. This programme aims at strengthening the spin-offs positions in the market. Entrepreneurs support researchers-entrepreneurs in growing their spin-off. The goal is to go from launching customer(s) to multiple customers (10x), to confirm the business model, and to become investor ready. The masterclasses are structured around experiences from other entrepreneurs and are supported by experienced experts in spin-off entrepreneurship, pitching, customer discovery, scaling-up sales and product development. An extensive network of 150+ mentors, investors, and partners support you during the program.

Network: During researchers' participation in one of the programmes and during their stay at UtrechtInc, they will be supported by coaches and a network of mentors composed of founders, corporate executives and investors. Appointments for advice or feedback can be set.

Community: UtrechtInc has set up a community of 200+ ambitious spin-off and/or start-ups and graduates.

#### c) Utrecht University's Center for entrepreneurship

The Utrecht University Centre for Entrepreneurship aims to create an academic environment for entrepreneurship. The center stimulates entrepreneurial behaviour that leads to new value creation, by:

- Actively showing which possibilities and facilities there are for potential and starting entrepreneurs.
- Inspiring with examples from entrepreneurial minds on and off campus.
- Organising events around entrepreneurship for students, researchers and entrepreneurs in the making.

In consultation with the staff department of the university board a (online) guide has been published, the *"From Researcher to Academic Entrepreneur"*<sup>99</sup> guide, introducing some concrete guidelines for researchers willing to create their spin-off.

<sup>99</sup> Utrecht University, From research to start-up, <<https://www.uu.nl/en/organisation/centre-for-entrepreneurship/for-entrepreneurs/from-research-to-startup>> [Accessed 29 Nov 2021]



**Figure 1.** “Overview of all steps- From researcher to Academic Entrepreneur” (Utrecht Centre for Entrepreneurship)

Firstly, researchers are encouraged to speak with their supervisor and to discuss their ideas and ambitions with the Research Support Office Staff. Then, they can contact Utrecht Holdings to examine the status of the IP, and to evaluate the technology and the market opportunities, and potential stakeholders. Moreover, the Utrecht Holdings will assist the researchers to engage in a discussion for IP protection and will explore possible routes to market (industrial collaboration, licences and or spin-off route). Utrecht Holdings may refer researchers or scholars with ideas with commercial potential to UtrechtInc to attend a workshop or validation programme for science-based spin-offs (e.g., programmes presented above). Utrecht Holdings can also advise them on applying for valorisation grants. After that, researchers must choose to what extent they want to stay involved in the business, and whether or not it will be necessary to discuss agreements, conflict of interest, and/or tacking and distributing shares. The researcher’s supervisors (immediate superior, Head of Department and/or Dean) will ultimately decide on the agreements that have to be made to ensure academic integrity, and on the potential consequences for the terms of employment. Once these issues are settled, researchers and their teams are ready to find funds and investors to finance the business.

#### d) Utrecht University

Researchers can also participate in the two-day course “Selling your science”<sup>100</sup>. “Selling your Science” is an interactive course, where researchers learn to sell their science. They practice key

<sup>100</sup> Utrecht University, *Selling your science*, <<https://www.uu.nl/en/events/selling-your-science-online>> [Accessed 29 Nov 2021]

skills such as negotiation, pitching and entrepreneurship. The course provides them with the basics of a business-perspective on research, by learning some fundamentals about entrepreneurship, Intellectual Property (patents and copyright) and conflicts of interest. The higher purpose of this course is to enthuse participants and make them realize that academic entrepreneurship is a very effective way of creating impact and can be a real career option.

### 3.5.3 UU's policy on spin-off creation

Within UU there are clear rules and frameworks when it comes to establishing and dealing with legal entities affiliated with UU. These rules apply for companies. Due to its commercial character, in general there is no place within the University for Private limited companies. Therefore, the private companies affiliated with the university should become housed in two holding companies, which have a greater or lesser share in each of these private companies. These holding companies are independent companies, in which the Executive Board has control as a shareholder and through membership of the Board of Supervisory Directors.

The UU Holdings mainly participates in private companies that can be designated as university spin-off companies. These small companies are well capable of providing specialist scientific socialize knowledge on a commercial basis and thereby contribute significantly to the university's valorisation of its scientific knowledge and discoveries. The holding structure guarantees that the commercial interests of the private company are strictly separated from the interests of that the university, and that the administrative involvement of the university with the private companies remains an indirect one, in a controlled, legal form.

To start a spin-off company at UU, approval from the Executive Board is always required. Researchers must follow several steps to set-up a spin-off:

- A business plan submitted to the Valorisation Department that gives feed-back, advice and support: business plan, how to apply for a subsidy, what external consultants and coaches to use, draw up the requisite contracts, introduce the entrepreneurs to potential investors.
- Find an entrepreneur who will run the business.
- Reach an agreement on the following subjects:
  - The ratio in which the employee involved will extend its time and effort on its duties at the knowledge institution and his/her duties at the spin-off;
  - The contribution of Intellectual Property rights and knowhow, where relevant;
  - The distribution of shares between the parties involved at the time of the foundation and, where necessary, agreements on a revision of this distribution ratio. In most cases, the knowledge institution may forgo having a share in the company to opt for a pure licensing deal;

- Where relevant, collaboration agreements between the spin-off and the knowledge institution, in line with the usual procedures. In this matter, the knowledge institution cannot be represented by the employee/entrepreneur
- The timetable for the foundation of the spin-off and any regularly scheduled evaluation moments which may be implemented until the commencement of business (and possibly thereafter);
- Insight into the possible consequences for colleagues
- Where relevant, a description of the supplier-customer relationship between the spin-off and the knowledge institution.
  - Normally, Intellectual Property rights will be conferred on the spin-off by the knowledge institution through licensing. In exchange for the rights, the spin-off will have to pay royalties and/or milestone payments.

Researchers who start a spin-off company usually do so from, or in addition, to their existing academic activities. Depending on the role chosen and / or the success of the company, a gradual transition to the new company can take place.

Utrecht University strictly monitors possible conflicts of interest. For this reason, employees are advised to enter a discussion with the management team in a timely manner about the amount of time (and the deployment of university resources) researchers are planning to spend on setting up the spin-off company, and whether this is permitted. There should be no ambiguity about this. The researchers' supervisors (immediate superior, Head of Department and/or Dean) will ultimately decide on the agreements that have to be made to ensure academic integrity, and on the potential consequences for the terms of employment. In case the entrepreneur him/herself is head of a department and / or serves as business development manager at a research support office, stricter rules apply. For example, it is not allowed to go into business as a head of department.

To ensure a company's success, it may be necessary for the knowledge institutions' employees to work at the company or to serve as consultants to the company. Compensation can be covered by means of a royalty agreement or consultancy fee. Employees/inventors can obtain a financial share either through a direct equity interest, through the knowledge institution's equity interest or through a licence conferred by the knowledge institution. Knowledge institutions have drawn up policies on how to allow inventors to share in the revenues from invested or licensed Intellectual Property Rights.

If a researcher wants to remain employed by UU, further agreements will need to be made to limit conflicts of interest. If the researcher continues to be employed by UU on a full-time contract he or she may never hold more than 4.99% of the shares (substantial financial interest). Utrecht Holdings will issue a binding advice to the faculty, if necessary, on how to manage the (substantial) financial interest of a researcher. In exceptional cases, arrangements can be discussed about a return

scheme, whereby the academic entrepreneur may return to its original position under predetermined conditions and/or terms.

In most cases, UU spin-off companies are based on Intellectual Property generated by Utrecht University. Utrecht University is the owner of the Intellectual Property of all results from education and research developed in the employment of the university. If researchers want to commercialise this IP, they need a licence. Only in case a spin-off has made a licencing deal with the University, one should pay royalties to the Utrecht Holdings (University). Utrecht Holdings has a share in spin-off companies. Balance sheet values are conservative as UU tries to value participating interests low given the risks that spin-offs do not always have to be successful.

For the redistribution of the profits to the Utrecht Holdings and/or departments involved, Utrecht University has model contracts in place.

The Association of Universities in the Netherlands (VSNU) has developed a “Guide to Dealing with Knowledge Institutions’ and Employees’ Equity Interest in Academic Start-Ups (or Spin-offs)”<sup>101</sup>: the knowledge institution’s basic principles regarding the knowledge institution and an employee of the knowledge institution acquiring or holding an equity interest in a start-up and/or spin-off. The Guide provides tools with which the knowledge institutions can prevent actual or alleged conflicts of interest. It was drawn up to explain the rules to employees, entrepreneurs, investors and other stakeholders. Concerning conflict of interest, it is mentioned that *“start-ups also pose certain risks, conflicts of interest (or the appearance thereof) between public and commercial/private interests. Therefore, the transition from public intellectual property rights to a private company must be realised in accordance with transparent rules”*.

- Financial interest: Depending on the nature and/or size of the spin-off, the interests of the parties involved in a spin-off may vary considerably. One major issue that may occur is financial interest, which often takes the form of shares in a spin-off. This Guide explains how having financial interest in a spin-off can be reconcilable with a knowledge institution’s mission. It also explains why there are limitations to this and provides possible solutions to knowledge institutions’ employees holding shares.
- Conflict of commitment: the ratio in which time and effort are expended on various duties, the ratio of a person’s tasks as an employee of a knowledge institution and the person’s tasks as a founder of a spin-off.

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<sup>101</sup> “Guide to Dealing with Knowledge Institutions’ and Employees’ Equity Interest in Academic Start-Ups (or Spin-Offs), Association of Universities in the Netherlands (VSNU), the Netherlands Federation of University Medical Centres (NFU), the Royal Netherlands Academy of Arts and Sciences (KNAW), the Netherlands Cancer Institute (NKI) and the Netherlands Organisation for Scientific Research (NWO), (April 2018), <<https://www.wur.nl/en/show/Guide-to-dealing-with-equity-interest-in-academic-spin-offs.htm>> [Accessed 29 Nov 2021]



The table below provides simple explanation on what to arrange in which situation.

| A company is being founded and/or someone is acquiring shares in a start-up<br>(simplified table) |  |  |  |
|---|--|--|--|
| <b>Employment?</b>  | Employee leaves the institution entirely                       | No arrangements necessary (unless a partnership with the institution is desired) | Arrangements must be made with regard to property rights                                     |
|   | Employee switches to part-time employment with the institution | Arrangements must be made with regard to potential conflicts of interest         | Arrangements must be made with regard to conflicts of interest and access to property rights |
|   | Employee continues to be employed by the institution           | Arrangements must be made with regard to potential conflicts of interest         | Arrangements must be made with regard to conflicts of interest and access to property rights |
|   | No   | Yes  |  |
|   |  | <b>Institution's property rights required?</b>                                   |  |

**Figure 2.** Arrangement regarding several situations

### 3.5.4 Support to business creation provided by and in collaboration with external actors

In addition to their own funds, such as managed by Utrecht Holdings, UU is a partner in several national funds that are specifically intended to finance early phase start-ups and/or spin-off (TRL 1-4). These funds were partly created with funding from the national government or the EU: Utrecht Health Seed Fund, Thematic Technology Transfer (TTT) funds: First Fund for Regenerative Medicine and Cardiovascular Diseases, TTT-AI for Artificial Intelligence and via our participation in the regional investment agency ROM Utrecht region and local VC's such as Thuja Capital.

In addition, there has been good cooperation with Rabobank for many years. The Rabo Pre-Seed Fund<sup>102</sup> is an initiative of Rabobank Utrecht, Utrecht University, Utrecht Holdings and Rijksdienst voor Ondernemend Nederland, executed by UtrechtInc. It helps ambitious start-ups and/or spin-off entrepreneurs to overcome their first funding needs and accelerate development of innovative and scalable ideas. The Rabo Pre-Seed Fund can provide starters with a loan of up to 68 000 euros. Companies must have been created for five-year maximum, must be private companies registered at the Dutch Chamber of Commerce, and should be built upon a technology driven business idea in Climate, Health or Education.

The Dutch government has implemented multiple “Subsidy programmes” to help start-up and/or spin-off survive critical initial phase<sup>103</sup>.

<sup>102</sup> Rabo Pre-seed Fund, <<https://rabopreseedfund.nl/>> [Accessed 29 Nov 2021]

<sup>103</sup> Netherlands Enterprise Agency, <https://english.rvo.nl/subsidies-programmes> [Accessed 29 Nov 2021]



Recently, the Association of Universities in the Netherlands (VSNU) started a new national initiative to promote entrepreneurial activities of PhD-students/Post-Docs: The Faculty of Impact<sup>104</sup>. The Faculty of Impact is the world's first faculty devoted to boosting the impact of scientific research. Its mission is to give young talented researchers greater opportunities to combine entrepreneurship and science. It offers the first ever post-doc programme focusing on entrepreneurship and valorisation. For two years, this programme will give talented young scientists the freedom and opportunity to further develop their creative and ground-breaking ideas. Via the Faculty of Impact, which will run until 2025, three groups of scientists fresh from obtaining their doctorates will be given two years to focus on the entrepreneurial development of their own innovative ideas. Among other support, they will receive training, intensive coaching and personal guidance from experts in the fields of entrepreneurship, intellectual property and investment. These post-docs will be exempted from standard university duties such as teaching and publishing articles. As Valorisation post-docs, they will be given an employment contract and salary by a research university, as well as access to research groups, laboratories and office space.

In addition, the Association of Universities in the Netherlands (VSNU), the Dutch Federation of University Medical Centres, (NFU), Netherlands Academy of Technology and Innovation (AcTI) and Techleap.nl have created the initiative “The Academic Start-up Competition”<sup>105</sup> that is supported by the Ministry of Economic Affairs and Climate Policy. The aim of the competition is to put valorisation and academic spinoffs in the spotlight. The competition offers the selected academic spin-off the chance to follow a customized incubator program and accelerate their business. The winners participate in a unique program of workshops, promotion track and peer to peer learning to help the founders to accelerate the growth and scalability of their business. They are introduced to the innovation ecosystem, and help them develop a network of peers, experts, and mentors.

<sup>104</sup> Universiteiten van Nederland, Faculty of Impact : the world’s first faculty devoted to boosting the impact of scientific research, <[https://www.vsnu.nl/en\\_GB/news-items/nieuwsbericht/690-faculty-of-impact-the-world-s-first-faculty-devoted-to-boosting-the-impact-of-scientific-research.html](https://www.vsnu.nl/en_GB/news-items/nieuwsbericht/690-faculty-of-impact-the-world-s-first-faculty-devoted-to-boosting-the-impact-of-scientific-research.html)> [Accessed 29 Nov 2021]

<sup>105</sup> Academic start-up competition, <<https://academicstartupcompetition.nl/>> [Accessed 29 Nov 2021]

## 4. COMMON GOOD PRACTICES ON SPIN-OFF CREATION SUPPORT DETECTED WITHIN THE ALLIANCE'S UNIVERSITIES

### 4.1 Good practices

Some common good practices to support academic spin-off creation implemented inside the CHARM' Alliance universities have been detected, through the analysis of data collected in the survey, and through the personal feedback of interviewees.

Firstly, each university has defined a policy with rules applying for Intellectual Property Rights and spin-off creation. This allows to create a legal framework serving as a standard for the same rules to apply for all researchers and for them to be aware of the universities' conditions for spin-off creation. These rules also protect researchers by providing them with a legal framework for Intellectual Property use and protection. Indeed, good protection of Intellectual Property is essential for the success of a business, in order to keep one step ahead of the competitor, not to be lined up or copied and to attract investors.

The Alliance's universities all have implemented some support for researchers involved in a spin-off creation process:

- Administrative and legal support provided by TTOs.
- Business support including access to finance, sales channel, marketing, management, provided through trainings, by incubators or through entrepreneurs or alumni' network.

It is also helpful for researchers to easily have access on the universities' website to basic information and rules concerning academic business creation. Hence, those information can be useful to answer the first questions of researchers while the idea is still emerging.

In addition, granting working-time arrangement, part-time positions, sabbaticals or multiple jobholding for researchers is an essential good practice to further develop and to support academic spin-off creation. Also, statutory advantages such as keeping their rights to advancement and to pension and financial advantages such as being remunerated can also boost spin-off creation.

Also, administrative agents from TTOs underline the importance of supporting researchers in building up a reliable and qualified team with a variety of profiles and a team that has the capacity to raise funding, attract financial resources.

Eventually, it can be underlined that all five universities are well integrated into the local and/or regional innovation ecosystem, have developed partnerships with other structures to better support academic spin-off creation.

## 4.2 Universities' TTOs' advice to researchers on spin-off creation:

Interviewed administrative agents from the universities' TTOs have formulated several recommendations that should follow researchers willing to be involved in a spin-off creation process. Communicating on these recommendations given by experimented people could be useful for researchers.

- It is primordial for the researchers to be well surrounded by setting-up a trustful and qualified team.
- Researchers must investigate diversifying the sources of funding of their spin-off. Indeed, competitive grants cannot constitute the main income stream of the project.
- Researchers may tend to underestimate the number of financial resources needed to develop the technologies. When asking for funding, they must not sell themselves short.
- It is important for researchers to learn how to popularise their scientific ideas to make an impactful speech in front of potential investors.
- Researchers must be aware of business' language and interests to be able to lead proper negotiations.

## 5. RESEARCHERS-ENTREPRENEURS' PERSPECTIVE ON SPIN-OFF CREATION SUPPORT INSIDE THE ALLIANCE'S UNIVERSITIES

Creating an academic spin-off is often a very challenging process for researchers as it requires business knowledge and skills that researchers are not familiar with. Most of researchers-entrepreneurs interviewed by the Alliance's universities have developed an interest in entrepreneurship prior to the spin-off creation and aimed at developing their entrepreneurial skills. Some triggers can help hesitating researchers to mature their business' idea and encourage them to start a spin-off creation project:

- It can be talking to experienced people, meeting with the “right person”, for instance an entrepreneur with business and entrepreneurial skills, who will help support researcher to create the business, or the meeting with a researcher that already has created a spin-off and become an inspiration and mentor.
- It can be following a specific training or programme to develop new skills and knowledge and better understand the business world. For instance, researchers from UU can follow the scientific venture program of incubator UtrechtInc.

At all levels (systemic, societal, university and individual), incentives and disincentives exist, impacting researchers' possibilities and willingness to create an academic spin-off to valorise their research results and technologies.

### 5.1 Incentives supporting spin-off creation

#### 5.1.1 Systemic incentives underlined by researchers for spin-off creation support

The European Commission offers excellent funding sources for spin-offs. A good example is the Fast Track to Innovation (FTI)<sup>106</sup> Programme for innovation ideas needing a push to go to market.

Most of the funding for spin-offs at the European level come from Flagship projects and other H2020 initiatives. Portals like EU Start-ups<sup>107</sup> gather all valuable information. The InvestEU Portal<sup>108</sup> allows projects promoters to reach potential investors worldwide. Registering a project on the online platforms boosts their visibility and give access to a large network of investors.

The Startup Europe Partnership (SEP)<sup>109</sup> is the integrated pan-European open innovation platform that helps EU scaleups grow and gather investors and accelerators from all Europe. Entering SEP

<sup>106</sup> Fast Track Innovation Policy, <<https://ec.europa.eu/programmes/horizon2020/en/h2020-section/fast-track-innovation-pilot>> [Accessed 29 Nov 2021]

<sup>107</sup> EU-Startups, <[EU-Startups | Spotlight on European startups](#)> [Accessed 29 Nov 2021]

<sup>108</sup> European Commission, InvestEU Portal, <<https://ec.europa.eu/investeuportal/desktop/en/index.html>>

<sup>109</sup> Start-up Europe Partnership, <<https://startupeuropepartnership.eu/>> [Accessed 29 Nov 2021]

means admission to an elite club of scaleups, with qualified access to many large established companies and investors.

In addition, to support women entrepreneurs, the European Commission has launched WEgate<sup>110</sup>; the European Gateway for Women's entrepreneurship. This online platform gathers a network of women entrepreneurs and number of stakeholders engaged to support women entrepreneurship across Europe, broadcasting useful and inspiring information, mostly presented through a short description text and useful web links.

Statutory and financial incentives implemented through national regulations are very useful for researchers that want to engage in the process of creating an academic spin-off. Indeed, statutory positions provide them with time to dedicate to spin-off creation while staying attached to their parent institution or being detached but with the reinsurance of being able to reintegrate their academic position.

Policy makers consider academic spin-offs to be major levers of economic development (Davenport et al., 2002; Lockett et al., 2005; Gisling et al., 2010) and commit significant funds with the goal of obtaining a significant return on their investment (Vincett, 2010).

National organisms providing financial incentives grants through calls to projects or competitions. Access to important funding allow researchers to fund clinical tests and develop their research and technology.

### 5.1.2 Societal actors' incentives underlined by researchers for spin-off creation support

Local organisms such as start-up and/or spin-off incubators can provide valuable incentives for researchers that can integrate an incubation program in order to develop business skills and knowledge. It gives them the keys to start a business creation process.

Also, entrepreneurs interested in commercialising a technology through the creation of a research-based spin-off are a huge incentive for researchers looking for an efficient team. Indeed, innovations need entrepreneurs who are prepared to take risks and develop appropriate business strategies to bring ideas to market.

### 5.1.3 Universities incentives underlined by researchers for spin-off creation support

Universities can support spin-off creation process by developing and maintaining an entrepreneurship culture inside the research laboratories and university. Universities can provide administrative and legal support through their TTOs and business, marketing and sell advice through incubators and alumni's networks for example. Head of Research Department can also support researchers in their project.

<sup>110</sup> WEgate, <<https://wegate.eu/>> [Accessed 29 Nov 2021]

To add, universities open the doors to technological resources and first-level knowledge so that it can acquire greater visibility, which improves the spin-off's company image and gives its services or knowledge the value they need to attract investors<sup>111</sup>.

For the social capital of researchers, it is important that they retain close ties with the university and therefore, must better not leave their academic position (Murray, 2004)<sup>112</sup>. It is also important for the university to retain scientific talent. That's why arrangements must be found between the researcher and the university, with the university providing researchers with advantages, statutory incentives to have enough time to work for the spin-off set-up and for them to be able to reintegrate the university after the spin-off is created and on track.

#### 5.1.4 Individual incentives underlined by researchers for spin-off creation support

For researchers, creating a spin-off is a way to try out new things, learn entrepreneurial skills and start a new exciting adventure. It allows to lift technological locks and give society access to cutting-edge technology. Researchers are strongly impregnated with the societal utility of public research; they frequent the public that will be able to benefit from the development of their technology and thus see the usefulness of valorising and commercializing their technologies. Creating a spin-off is the opportunity to connect the whole value chain from fundamental research to societal application. It allows to learn how to value science outside of the sole purpose of publication and output. There is an auto-satisfaction of researcher that always aims at doing better and surpassing his or herself. It also helps to stabilize the research despite fluctuation of manpower and allows the researcher to keep working on the same field to go deeper in the development of their ideas and having access to funding. If the spin-off creation is a success, it can be a booster and twist in the researcher's career and give success and recognition. As there is a lot of competition in the scientific research field, creating a spin-off commercializing cutting-edge technology allows the researcher to remain competitive and keep his or her position. Financial benefits can also constitute an individual incentive but is not often mentioned by researchers as the main booster for spin-off creation.

## 5.2 Disincentives hampering spin-off creation

### 5.2.1 Systemic disincentives underlined by researchers for spin-off creation support

Some of the national regulations of the CHARM 'Alliance's countries may be not clear enough on the possibilities offered to researchers to create a company while remaining in an academic position. Not enough statutory and financial incentives are implemented at national levels to support researchers in the process of academic spin-off creation.

Also, researchers have noted that in their countries the culture and environment differ from the United States, where there is a strong entrepreneurship and spin-off creation culture. In some of

<sup>111</sup> Senesciencia number 4, The University Spin-off, <<http://www.ub.edu/senesciencia/noticia/university-spin-off/>> [Accessed 29 Nov 2021]

<sup>112</sup> F. Murray (2004). "The role of academic inventors in entrepreneurial firms: sharing the laboratory life", Research Policy, pp. 643-659

the countries of the Alliance, the entrepreneurship culture and connections are missing. Inside universities, the concentration of the people who understand and may support business is very low, according to interviewed researchers. For instance, in France, young researchers feel little encouragement to valorise their research's results through the setting-up of a spin-off<sup>113</sup>.

Furthermore, there is a cultural bias on the value of Technology Transfer. Indeed, scientists have been taught to place more value on publications than on patents and commercialization of technology as a business opportunity, that is time-consuming. A cultural swift needs to be achieved on the long term to implement an entrepreneurship culture inside the university and among researchers.

In addition, researchers and support's structures underline a lack of early stage type seed funds to promote and encourage the creation of spin-offs.

### 5.2.2 Societal actors' disincentives underlined by researchers for spin-off creation support

Most of the time, it is difficult for researchers to find investors willing to invest in high-risk projects. In a spin-off creation, the risk is very high so investors can be reluctant to invest, and even more if the project does not have a very high maturity level. Initial risk-investment represents an important difficulty for spin-off creations. Above all, researchers creating a spin-off need to raise very important amount of money (sometimes several millions), as funding technology development and clinical tests are very expensive. Spin-off creation is investment-intensive. Therefore, they need to find investors willing to make a significant investment and to accumulate grants' applications, answers to call for projects and participate and win competitions to raise enough money to make their project a reality. Thus, finding sufficient funding is very time-consuming for researchers.

In addition, private investors and spin-off' shareholders want to be detached from the universities and not owe anything to anyone. Researchers underline a big gap between the finance and business world and the academic one. That makes arbitration difficult for researchers that must follow rules from both sides if they want to succeed in creating their academic spin-off.

It is also complicated to find entrepreneurs interested in deploying and selling scientific technologies. Entrepreneurs do not have the reflex to look for scientific technology to valorise inside universities' research units.

In the national and local ecosystems for spin-off creation, there are multiple actors offering similar services (spin-off incubation for instance). The ecosystems' visibility is not clear for researchers. There is a need of coordination and centralization of spin-off support activities.

<sup>113</sup> BPI France and PhD Talents, Baromètre national jeunes chercheurs et entrepreneuriat (March 2021)



Samsom and Gurdon<sup>114</sup> point out that possible conflicts between scientists and appointed management may be harmful for the success of the spin-off or even cause its failure.

### 5.2.3 Universities disincentives underlined by researchers for spin-off creation support

In its concrete application, support to academic spin-off creation inside universities can be not efficient enough and not exactly adapted to researchers' needs. Researchers from the Alliance's universities underline a lack of support and information from the university. Spin-off creation is not at the heart of the discussion inside the universities. Also, the way of presenting spin-off creation process may be not very attractive and motivating. Researchers notice a lack of training and expertise from TTOs' administrative agents on spin-off support. Some contracts have been badly negotiated from a business point of view, as a result of which contracts can slow down the growth and agility of companies<sup>115</sup>. There is sometimes the need to renegotiate contracts afterwards.

Researchers also underline the fact that universities do not know how to properly financially estimate the value of an asset or technology. This misknowledge can have a huge impact on the spin-off creation and development. For researchers, universities must be able to position themselves at a fair value or alternatively to share the risks of spin-off creations. Moreover, if the university owns the IP, licenses granted for the spin-off can be very expensive.

Inside the research units, researchers-entrepreneurs involved in a spin-off creation process are confronted to their colleagues' misunderstanding about their approach. Some colleagues indeed have an ideal of public service and knowledge production that must be disinterested from generating economic value and thus do not adhere to academic spin-off creation. Being involved in a spin-off creation can thus be frowned upon by the peers.

### 5.2.4 Individual disincentives underlined by researchers for spin-off creation support

From researchers' personal perspectives, several disincentives can prevent them from starting a spin-off creation project.

First, researchers usually have a lot of obligations and thus do not have enough time to dedicate to the project of creating a spin-off. It requests a lot of energy and persistence and thus can have an impact on the researcher's personal life as it is time-consuming and may be stressful.

Moreover, it can be challenging for researchers to step out of their comfort zone, some of them can have restrictive beliefs about their capacities to be involved in a spin-off creation.

Spin-off creation also requests to adapt from the academic and scientific culture to the business one. Researchers usually lack of business and entrepreneurial skills and knowledge and do not know how to create a business and where to start. Furthermore, legal competencies are also necessary,

<sup>114</sup> KJ. Samsom and M.A. Gurdon (1993). "University scientists as entrepreneurs: a special case of technology transfer and high-tech venturing", *Technovation*, pp. 63-71.

<sup>115</sup> According to some of the researchers that have been interviewed

for example in order to understand the status of the society and the terms of the contracts being negotiated. Researchers may feel not qualified enough on the business side to start their project. They must also deal with the difference of timeline between academia and business world. Reaction times are very different between academia and the private sector. Indeed, suppliers, clients and even the workers of a spin-off are used to quicker times than those of academia.

In addition, creating a spin-off is a risky project where chance of success is uncertain. Researchers can fear failure and put pressure on themselves because if the spin-off is a setback, the experience will not be valued by the peers and the institution.

Also, creating an enterprise represents a career break. The researcher is not sure to retrieve his or her original position inside the university and his or her research unit if the project fails or if the researcher does not want to keep being involved in the spin-off at a certain point of time. For senior researchers, it may represent a loss of prestige and position.

## 6. RECOMMENDATIONS TO BETTER SUPPORT SPIN-OFF CREATION

Interviewed researchers have formulated several potential preliminary recommendations for the systemic and university levels, to improve the support to academic spin-off creations.

### 6.1 Recommendations for national levels

National policies should address science in the long term and more investments shall be granted in science. National framework conditions and policies must be appropriate to provide a stable environment for academic spin-off creation. Focused work is required in policies areas such as tax rates and incentives, education and training, business regulation and legislation, licensing, Intellectual Property Rights protection, rewards for risks, researchers' sabbaticals for company's creation with statutory and financial advantages. Qualitative support must be accessible to researchers in business management, access to finance, access to market.

Access to funding is notably an important challenge for researchers-entrepreneurs. A broad spectrum of financial options matching the different stages of spin-off development must be available for researchers-entrepreneurs, especially in the early stage of spin-off creation. A stable and appropriate supply of finance promotes growth and encourage spin-off. Alternative sources of funding such as seed and venture capital, alternative lending instruments including peer to peer lending, supply chain finance and crow-funding can be valuable sources of funding. Researchers must be able to have an easier access to important financial guarantees. Venture capital is an essential source of funding for spin-off seeking to achieve scale quickly. Initiatives to help financial intermediaries gain a better understanding of academic spin-off creation process could be implemented.

Furthermore, academic spin-off's added value to society should be emphasis and rewarded at systemic and university levels to develop a culture of entrepreneurship and attitude to risks inside societies and among research laboratories.

### 6.2 Recommendations for universities to better support spin-off creation

More financial and statutory incentives plus facilities must be implemented by universities to concretely support their researchers and develop entrepreneurship inside their institution. There is also a growing need for guidance on dealing with Intellectual Property Rights in academic spin-off.

- Universities must promote entrepreneurship as a “way of being”, as an opportunity to develop projects' management skills, to be able to identify problems and find solutions, skills that are very valuable in the professional world. Innovation must not only be presented as technological, but also as a way to find new processes and improve the existing ones.
- Human resources

Universities must invest in qualified human resources if they want to tackle the challenge of developing the support to spin-off creation, reach more projects, and absorb growth and answers to the needs and expectations of researchers-entrepreneurs.

The universities should create a professional team to develop entrepreneurship's culture inside the research units and the university and to support spin-off creation process. People with business and entrepreneurial skills and knowledge should be hired. More guidance and flexibility should be provided to support researchers. Real support and useful advice adapted to academic spin-off creation should be provided along the process.

- Raising awareness among researchers

Researchers usually lack information on the possibilities of setting-up a spin-off inside their university. Thus, the institutions must increase the promotion of spin-off creation among researchers and make them feel supported in the process and show them the possibilities and not only the difficulties of creating an academic spin-off.

- Promoting entrepreneurship

Entrepreneurship should be promoted inside universities since bachelors' programmes in a more targeted way, for instance it could be discipline-based. Indeed, education plays an essential role in shaping attitudes and culture. Training systems should enable students to acquire business and entrepreneurial knowledge and skills. Early stimulation could make young researchers considering spin-off creation as a viable option for Technology Transfer to society.

- Working-time arrangements

Universities should provide researchers creating a spin-off with working-time arrangements' possibilities for them to be able to focus on their project while staying attached to the university.

- Legal support

Administrative agents should be able to provide legal advice independent from the universities or investors interests. Contracts should be negotiated in compatibility with a spin-off development.

- Provide Incubation and Acceleration programmes

Clarysse and Moray (2004)<sup>116</sup> state that it is important to give the technology inventors time to learn how to run the business, supported by a business coach who is not involved in the company. According to their opinion, this will create the possibility for the scientists to become CEO themselves, or otherwise that their experience aids the acceptance of the appointment of a CEO from outside into the management team.

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<sup>116</sup> B. Clarysse and N. Moray (2004). "A process study of entrepreneurial team formation: the case of a research-based spin-off", Journal of Business Venturing, pp. 55-79

Each university should provide internal spin-off incubation and acceleration trainings that should be more adapted to academic spin-off creation than programmes researchers can find in external incubators. Researchers that have experience in spin-off creation could be trainers or mentors. Thus, the discourse and advice would be more adapted to researchers' needs.

Also, guidelines should be edited to help researchers interact with entrepreneurs and investors. More interactions with business entrepreneurs should be organized. Researchers must be taught to popularise their scientific ideas and pitch their project in an insightful and synthetic way that can be understandable by investors.

- Network

A network of researchers-entrepreneurs should be created and maintained through frequent meetings, trainings, workshops etc. These networks are an important plus-value source for researchers through sharing of practical experiences and advices, contacts and interactions.

## CONCLUSION

Deliverable 5.2 oversees various spin-off creation approaches in the Alliance's countries and universities.

All of the partners institutions have an history of successful spin-off creations inside their walls and experience in supporting such process. However, some lacks have been detected and challenges need to be worked on to increase researchers' skills and capacity to create academic spin-off and to increase the support provided by their parent institution.

In this report, we have underlined the fact that spin-off creation is not a unique and linear process but may involve multiple pathways. The involvement of researchers can vary significantly in the process. Researchers do not have a single role and can participate in several development phases. They can be entrepreneur themselves or they can delegate the business side to a CEO, by associating with an external business entrepreneur, and provide scientific consultancy to the newly created enterprise for example. Harmen Jousma and Victor Scholten have identified four types of academic spin-off creation pathways: Business Run by Scientist, Business Run With Others, Business Delegated to others and Business Run by Others.

At national levels, we have noticed that policies regarding possibilities for researchers to be involved in academic spin-off creation have been deployed, or are currently under development. Those policies have notably created rights for researchers to be involved in a private activity, with the implementation of specific statutory positions (limited in time), rights to part-time jobs, sabbaticals, possibilities for researchers to take shares in the spin-off and other status. Policies thus create opportunities for researchers to remain attached to their parents institutions, with sometimes retaining of their rights and remuneration, while being involved in the creation of an academic spin-off. Yet, in some countries, policies are not clear enough to provide researchers with sufficient incentives for them to start engaging in an spin-off creation process. Entrepreneurship culture and connections may be missing in some countries. Researchers might feel little encouragement to valorise their research's results through the setting-up of a spin-off. A cultural shift to build an entrepreneurship culture and mindset in the societies still need to happen or to be reinforced.

In addition, the question of access to important funding is essential in entrepreneurship. Academic spin-off creations constitute investment-intensive and high-risk projects. Thus, pre-seed funding shall be more easily accessible for researchers-entrepreneurs.

The level of support allocated to researchers involved in a spin-off creation process varies greatly from one university to another. Some of them have implemented strong policies, procedures and support for spin-off creation, while it is still under development in some other universities. It is essential for universities to have clear rules on Intellectual Property Rights and licensing in the case of spin-off creation.

All partner institutions have integrated spin-off creation advice and support in their research, partnerships and support offices and/or TTOs. Yet, it may happen that administrative agents are not

experienced enough to provide researchers with valuable advice and support. It could be interesting for universities to hire employees with business background to improve this support, as a complement to legal support.

One of the main challenge for researchers is that they have mostly not acquired business skills, yet essential for academic spin-off creation. Thus, they may not feel capable or legitimate to build up and carry on a project of spin-off. Spin-offs need to be economically sustainable and thus require good business management and development skills. Researchers need to learn how to popularize their idea, to turn them into economic value and to pitch their project in front of potential investors, that are essential for the scale-up of the spin-off. Some universities offer support in business development and management, team creation, marketing, sale, market, fundraising and other items. Other have not developed such support, mainly because trainings are already provided by external actors. This is why association with societal stakeholders is also of main importance. Indeed, all partner institutions are well integrated into their local ecosystem of innovation and working in close relation with external stakeholders to provide support to researchers engaged in spin-off creation process. Yet, this internal and/or external support may be too focused on spin-off creation without taking enough into account specificities of academic spin-off creation, especially if the researcher does not delegate the business side but is the entrepreneur him or herself. Thus, common work with external partners should be carried out by universities in order to develop appropriate trainings and support to public researchers. It could for instance be interesting for partners institutions to build up or further develop a “researchers-entrepreneurs’ alumni-network for researchers to have access to mentor, to appropriate training and advice from their peers.

In Deliverable 5.2, it is also essential to understand and analyze the individual perspective of researchers. Indeed, they are in the front line of spin-off creation, they are the project leaders. Academic spin-off creation is not only a professional project but also a personal one, as it is highly time-consuming and thus have an impact in personal life. It involves a different vision and perception of oneself and a swift of mindset. Researchers-entrepreneurs may also face the disapproval of their colleagues. Moreover, the chance of failure being high in such project, it is a stressful process. Thus, national authorities and universities must provide researchers with incentives and a security net in case of failure to reassure them and support their initiative and risk-taking, that is very valuable for the universities and the society. More advantages should be provided to support researchers-entrepreneurs and more awareness should be raised in research units on entrepreneurship and incentives.

The outputs of this work package 5 and deliverable 5.2 will feed into WP8 “*Common strategies and policies*” and WP9 “*Action plan and pilots*” and thus work towards promoting institutional change within and across the alliance to better encourage, develop and support academic spin-off creation by researchers of our universities.



## ANNEX I: SPIN-OFF CREATION APPROACH SURVEY

1. Do you have offices responsible for spin-off creation support ?
  - Yes
  - TTO
  - Other Office (please indicate)
  - Not explicitly, but it's part of responsibilities of specific agents or offices (please precise)
  - No
2. Is there a handbook/ written methodology available for researchers willing to create a spin-off ?
  - Yes (please link the document)
  - No
3. Does a researchers' team must ask the permission from the University to create a spin-off ?
  - Yes, it is compulsory
  - Yes, it is recommended
  - No
4. Which of the following support is available inside the University for researchers willing to create a spin-off ?
  - Administrative support
  - Legal support
  - Financial support
  - Business management support
  - Marketing support
  - Sale' strategy's support
  - Other (please indicate)
  - None
5. Which of the following steps must follow a researchers' team from the University to create a spin-off ?  
[Multiple answers possible]
  - Pre-maturation
  - Maturation
  - Pre-incubation
  - Incubation
  - Other (please indicate)
  - None
6. Is there an agreement framing IP transfer from the University to the spin-off ?
  - Yes (if you have a template/model, please send it to us if possible)
  - No
7. Does the university has a start-up incubator ?
  - Yes (please link the incubator's website)
  - No
- 7.1. If yes, can a spin-off be incubated in the start-up incubators ?
  - Yes
  - No
  - I don't know
8. How many spin-off were created at your University in total ?

9. Which positions can take the researchers inside the spin-off ?

- Funder
- Shareholder
- CEO
- Director
- Associate
- Employee
- Other (please indicate)

10. Is there a transitory status for researchers creating a spin-off ?

- Yes (please indicate the status' main elements)
- No

10.1. How can the researchs' time be shared between his/her job at the University (research, teaching responsibilities) and the creation of a spin-off ?

Please indicate in %

10.2. Once the spin-off is launched, how can the researchers' time be shared between his/her job at the University (research, teaching responsibilities) his/her job inside the spin-off?

Please indicate in %

11. Does the spin-off must redistribute royalties to the University ?

- Yes
- No
- I don't know

## ANNEX II: INTERVIEW MATRIX FOR RESEARCHERS-ENTREPRENEURS

1. How was matured the idea of creating a spin-off ?
2. What were your personal motivations to create a spin-off ?
3. How many researchers worked on the spin-off creation ? From which research unit and discipline are they from ?
4. Which innovation is commercialized through the spin-off ?
5. Did you get support from the University during the spin-off creation process ? If yes, what kind of support ?
6. Are you satisfied with the support offered by the University ?
7. Which recommendations would you give to the university to improve spin-off creation's support ?
8. How did you finance the spin-off creation ? Who are the investors ?
9. Did your spin-off get incubated in a start-up incubator ?
10. Who are the shareholders of the spin-off ?
11. What are your position(s) inside the spin-off ? (Director, head, associate, employee, shareholder ...)
12. Which difficulties did you encounter during the spin-off creation process and how did you overcome/solve them ?
13. Do you think that the researchers are well aware of the conditions for spin-off creation inside the University ?
14. According to you, what are the main barriers hampering spin-off creations inside the University ?

### ANNEX III: INTERVIEW MATRIX FOR START-UP INCUBATORS

1. Date of creation
2. What are the objectives/mission of the start-up incubator ?
3. Which support is offered to the incubated start-up ? Please describe the different trainings/services available
4. How many start-up are incubated per year since the incubators' creation ?
5. Who are the different stakeholders involved in the incubators ? (For instance : entrepreneurs, enterprises, investors, mentors ...)
6. Success story of an incubated academic start-up/spin-off
7. What are the good practices implemented in the incubator to support start-up creation ?
8. Which difficulties do you encounter ?
9. Which recommendations would you give to improve spin-off creation's support ?

## ANNEX IV: INTERVIEW MATRIX FOR TTO ON SPIN-OFF CREATION SUPPORT

1. Did you get the opportunity to support the creation of a spin-off inside the University ?
2. How many spin-off were created at the University ?
3. What is the methodology to support the creation of a spin-off ?
4. According to you, which barriers are hampering spin-off creations at the University ? (For instance regulatory, financial or political barriers)
5. Which difficulties do you encounter in your daily work ?
6. According to you, what are the best practices implemented at the University to support spin-off creation?
7. Which recommendations would you give to the University to improve spin-off creation's support ?