

Project Deliverable

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Abstract :

The present document aims at giving an overview of the different lessons learnt throughout the project from the first step, which was the training needs analysis, to the implementation of seminars, academies, advanced services and e-learning modules, and to the final conference of the project.

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1. Executive summary

Health-2-Market (H2M) was a 3-year long Coordination and Support Action, funded by the European Union's Seventh Framework Programme for research, technological development and demonstration. H2M aimed at providing training and individual support to Health / Life Sciences researchers in the process of translating their research results into successful new business ideas.

With a view to successfully realising the ambitious aims of H2M, a portfolio of high-level services, training actions and tools were designed and offered free of charge by the H2M consortium, escalating to address the needs of all potential target groups (including researchers in the field of Health / Life Sciences, European Health research institutes, Technology Transfer Organizations, EU Health-related companies, entrepreneurs and intrapreneurs, Health / Life Sciences European networks, NCPs etc.) throughout the duration of the project.

The lessons learnt and recommendations presented in this report are based on the training needs analysis done at the beginning of the project and on the trainings and services organised. During the Training Need Analysis, the major risks from the entrepreneurs' point of view were related to the investment of money, time and energy into something that "might not work" and the financial risk like bankruptcy. A smaller part referred to the risk related to the prejudice in the career "if the idea is not successful". Among skills gap mentioned, one could find:

- Knowledge on how to commercialise a product/service or "how to do business"
- Marketing knowledge
- "How to network"
- Administrative, financial and marketing knowledge
- Legislative and legal framework
- "How to find financial funds"

During the project's trainings and services, these lessons learnt were confirmed and also showed others concerning support organisations such as the difficulties they can be faced with when trying to facilitate the "transformation" of the researcher to the entrepreneur. Besides challenges faced by individual researchers, entrepreneurs and support organisations, challenges faced by participants in collaborative projects were also identified such as the instances of conflict of interest, the difference in culture and expectations between academic and industrial partners or the difference between countries.

Challenges are important but so are drivers for entrepreneurship. These vary depending on each researcher but they include:

- Earning potential;
- See their ideas being implemented at a large scale;
- Improve society's health and well-being.

Support organisations mostly do their job; however, there can be an additional driver to having access to innovations that are beyond state-of-the-art in the fact that it can provide opportunities for additional business acquisition.

Recommendations were formulated to policy makers at European, national and regional level as well as to universities and support organisations. The European level is already implementing new measures to support the exploitation of research results and it is hopeful that it will bear fruits in the near future. However, implemented measures could go even further by providing **specific exploitation support to funded collaborative projects performing well on their exploitation plan.**

At national and regional level, policy makers should **address the mind-set of academic researchers** to try to make them **more business oriented with undergraduate courses** for example or by **providing more support and possibility for open access e-learning resources.** They should also **be extremely strict in their selection of young SMEs/startups to support** in order to increase their efficacy and support the most promising ones.

Universities can also play a role in the mind-set change of researchers by integrating entrepreneurship courses in PhD curricula and by **supporting their research staff in training for strategic management of innovation.** Academic's systems could also provide incentives and **actively support creation of startups** with **some time-off from "active duty", positive support** and an **easy way back into academia if their startup failed.**

Finally, technology transfer offices and other support organisations need to **provide tailor-made services to health researchers, especially regarding legislation/ regulation issues.** They could also provide opportunities to match researchers with people from the business side. This includes people a researcher can team up with in order to create a venture.

2. Introduction and methodology

The last 10 years have been a period of substantial organisational reconfiguration in the health sector, and increased entrepreneurial activity has been at the core of that process of change. In the health field, there exists an abundance of business opportunities but the educational background of life science researchers and health care practitioners provides no exposure to entrepreneurial concepts and only limited exposure to business skills. The European experience has demonstrated that entrepreneurship can be a powerful lever to induce institutional restructuring in the health sector. Entrepreneurial behaviour has long been recognised as the central catalytic element in stimulating industrial innovation, defined as the process of identifying, developing, introducing and commercialising a new product or service.¹ This is why the Health-2-Market project focused on bringing about such an entrepreneurial mind set among Health/life science researchers by providing them training support.

The Health-2-Market (H2M) project had the goal of boosting the economic exploitation of research results, including from EU-funded projects, in the area of Health/life science by supporting researchers and entrepreneurs across Europe. The major training and knowledge transmission activities –academies, seminars, online-learning– in the project were supported by direct and hands-on consultation, coaching and services. The project started by first defining the training needs of the target audience, namely health/life science researchers, entrepreneurs and supporting organisations, via a vast online survey, bibliography analysis and round table discussions. Once the training needs were defined, the project designed the various training formats and contents: 1-2 day(s) seminars, 5 day long academies and e-learning modules.

The project then implemented these different training tools and further interacted with health/life science researchers and entrepreneurs via personalised support (e.g. market study, patent evaluation, business plan formulation, etc.).

This document presents the major challenges, drivers and lessons learnt from the training need analysis to the various project's implementations (trainings, e-learning and personalised support):

- The **challenges and drivers for entrepreneurship and exploitation of research results** experienced by health/life sciences researchers, collaborative projects, supporting organisations and startups;
- **Supporting health/life sciences researchers on the topics of Intellectual Property Rights (IPR), entrepreneurship and business planning, and marketing.**

Based on these lessons learnt, recommendations to policy makers, universities and technology transfer offices have been drawn. These recommendations are in no way exhaustive – they are based on the feedback from participants in project's activities as well as on the partners' analysis of the project activities.

¹ Saltman, R., Busse, R., & Mossialos, E. (2002) "Regulating entrepreneurial behaviour in European health care systems", *European Observatory on health Care Systems Series*

Methodology

Several sources were used to draw the lessons learnt and recommendations presented in this report.

First, the project's team had done a major analysis of the health/life sciences researchers training needs related to entrepreneurship and valorisation of research results. Highlights of this report are summarized in section 3 and the full report is presented in annex 1.

Second, during the course of the project, trainers (business schools) and personalised support providers (other partners) interacted with health/life sciences researchers, entrepreneurs, technology transfer officers and other supporting organisations and were able to draw some lessons about their challenges and drivers for entrepreneurship and utilisation of research results. They were also able to draw lessons on various issues such as IPR, entrepreneurship and business planning and marketing. In order to collect their lessons learnt and recommendations, a simple questionnaire was designed and disseminated among them (Annex 2). Their answers were analysed and are reported below.

Third, the e-training activity of the project has clarified current challenges, gaps and needs in the European ecosystem of actors connecting research to business in the field of Health and Life Sciences. Based on the project's findings related to the number of e-learning participants, their overall engagement and feedbacks and to the partners' interactions with them, several conclusions were drawn which will be further elucidated in the following sections.

Finally, the final conference "Tools to valorize research: 1 day to follow the road from research to market!" also gave a final opportunity to interact with researchers, entrepreneurs and support organisations. The event was structured in 2 parts: 3 round tables and a speed dating "ask the experts" session.

3. Training needs analysis

In order to adequately **orient** the project support activities aimed at fostering and enhanced innovation and entrepreneurial mind-set of health/life sciences researchers, the Health-2-Market project team conducted a **Training Needs Analysis (TNA)** at the beginning of the project. **The primary objective of the analysis was to determine the researchers' actual knowledge and skills in the field of commercial exploitation of research results and to identify their needs for training in order to overcome the knowledge/skills gap and potentially perceived obstacles and risks.** Indeed training activities are one of the most efficient ways; first to encourage researchers to exploit research results and to have an entrepreneurial attitude, and secondly to enhance their skills and therefore to enlarge the rate of success.

The **Training Needs Analysis** was based on the rationale that, before defining the content of the training action plan, it was necessary to define the needs of the researchers and to determine if all researchers have the same needs or if they can be differentiated through several categories.

The **Training Needs Analysis built on the existing and user-reported evidence gathered in the project's Learning Evidence Base.** The analysis itself was done in two phases and was in total built on **four sources**, each independently analysed beforehand:

Phase 1:

- ⇒ **Bibliographic analysis** of 22 relevant documents/studies;
- ⇒ **In-depth phone/face-to-face interviews** with 26 selected experts (researchers, entrepreneurs, Technology transfer officers, etc.);
- ⇒ **Online survey**, having brought 637 completed responses.

Outcome from Phase 1: draft Training Needs Analysis Report, used as a basis for the next phase

Phase 2:

- ⇒ **2 Roundtable discussions**, bringing together experts in Health research / support (researchers, entrepreneurs, TTOs, Health NCPs, IPR experts, etc.)

Outcome from Phase 2: final Training Needs Analysis Report, updated version of the draft report with findings from the roundtable discussions

The first three sources were complementary to each other: the online survey provided, by the number of persons contacted, some insurance about the findings, the interviews provided qualitative insights to support the analysis and the bibliography increased the volume of available data and provided some guidance. The Roundtables served as a discussion and validation mechanism for the findings that were discussed in expert groups.

The respondents to the online survey were asked to evaluate themselves (Likert scale with five levels of answers: from 1-very low to 5- very high) which brought evidence on 4 main parameters (variables), namely:

- ⇒ Overall competence (based on their auto-evaluation through 14 competence indicators)
- ⇒ Commercial Awareness (*openness, experience and interest in commercial exploitation topics*)
- ⇒ Institutional Support

⇒ Training Interest

According to their respective average notation obtained, **6 homogeneous clusters (groups of respondents) were identified**, enabling a classification of the stakeholders/users which need some training support. Three of the 6 clusters expressed an interest for training activities. Therefore **the Training Needs Analysis was concentrated on the needs of these 3 groups** with respect to business/entrepreneurship training along with **additional information for a fourth cluster (cluster 4)** which were addressed by promotion on trainings as well.

As the cluster groups differed significantly along the other three parameters (Institutional Environment, Competence and Commercial Awareness), the Health-2-Market approach, training service and expected impact needed **to take into account these differences**.

The Training Needs Analysis investigated for each of the 14 preset competences, the respective capacity of each user group and therefore the skills gap, if any, to be filled by the training activities. Moreover, through the answers to the online survey, supported through evidence from the qualitative interviews, we identified the **barriers – external obstacles and risks –** perceived by the respondents from the clusters. The training action plan was designed to find a way to remove the barriers by providing trust and confidence through success stories, solid packages of tools and practices.

During the Training Need Analysis, the major risks from the entrepreneurs' point of view were related to the investment of money, time and energy into something that "might not work" and the financial risk like bankruptcy. A smaller part referred to the risk related to the prejudice in the career "if the idea is not successful". Among the skills gap mentioned, one could find:

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- "How to find financial funds"

With the analysis complete, the project's team formulated training recommendations focused on health/life sciences researchers that the team used within the seminars and academies during the training implementation phase of the project, including:

- Financial and market analysis aspects
- Business Plan construction
- Intellectual Property Rights (for less experienced target groups)
- Mentoring
- Networking and contacts to experts (venture capitalists, IPR experts, etc.)
- Practical training

Finally, the Training Need Analysis concluded that an important training element should be **"to change the mind-set"** of the researchers in order to **make them perceptive to commercial exploitation activities** and to give them an "outcome orientation" with regards to financial aspects.

With the end of the project, it is now possible to say that the offered trainings found their audience to confirm the validity of the Training Need Analysis developed at the beginning of the project.

4. Lessons learnt

4.1. Challenges for entrepreneurship and utilisation of research results

Researchers

The first challenge researchers face when thinking about entrepreneurship and utilisation of research results is their **own mind-set and academic perspective**. Academic researchers are trained for academic research and generation of knowledge. They typically don't have an entrepreneurial mind-set and this is not easy to acquire when one does not have any knowledge about entrepreneurship. Furthermore, it is not easy for academic researchers to explain to colleagues why they wish to exploit their results personally and they may face doubts and even resistance from these colleagues. Indeed, exploitation is still not considered "noble" by researchers compared to research. If they continue in the entrepreneurial path, they may lose access to their fellow researchers which in turn might make access to laboratories or other facilities difficult.

The second challenge they face is that it is **difficult to change one's professional career**. They have to determine how to balance exploitation goals without sacrificing too much in terms of personal resources (e.g. time, effort) or giving up a secure, tenured position.

The third challenge is that they **lack information on entrepreneurship and business basics**, such as business opportunity screening, value proposition, market segmentation, competition analysis and business plan development. In addition to their solid field expertise, European researchers today need to be equipped with deeper business-related knowledge as well. They don't know how to proceed with exploitation of their results as they lack the experience, knowledge and time to pursue business centric plans. Support exists to help them but finding what the right form of support is also a challenge. Indeed, researchers participated in highest numbers in the e-learning training course on Entrepreneurship and Business Planning, which contains lectures mainly targeting the health and life sciences researchers focusing on market value identification of an innovative product, writing a business plan, better understanding the market positioning of the product and social trends that should be considered when launching a new product in the market. Moreover, modules covering the "eco-system of funding" were highly demanded: all sources of funding that can support the launch of a new product in the market, what is expected from researchers and what the functioning of this process looks like. Learning through courses is therefore important; however, meeting people with a business or entrepreneurship background (even teaming up with them) is something different. Opportunities to mingle and exchange with such people are still rare and the ones that happen are often pitching events where researchers showcase to venture capitals but do not truly exchange.

The fourth challenge for them is to thoroughly understand and, consequently, exploit in the most efficient way, the overall "ecosystem of funding": **a full awareness of which funding actors exist today, how to approach them, and which support they can provide is still lacking**. They also have to know what kind of money they will need and when. So strategically evaluating and planning their financial needs under a specific strategic perspective (both as research group leader and entrepreneur) is key.

These challenges based on the interactions of trainers with researchers during the academies or seminars, on the interactions of service providers during the personalised supports of the project and on the utilisation of the e-learning platform confirm the challenges found during the Training Needs Analysis.

Support Organisations

Support organisations have to support researchers in their utilisation of research results and this activity has its own set of challenges. One challenge from internal (e.g. tech transfer offices) and external support organisations (e.g. external consultants such as engage AG) is **helping the researchers to formulate an overall innovation strategy for researchers that take into account exploitation**. Once convinced of potential exploitation, it is a matter of convincing researchers to pursue follow-on support in the form of a market study, patent strategy, or other targeted exploitation concerns. The follow-on funding of filing for patents, patent maintenance fees, finding exploitation partners, etc. is also an ongoing concern for support organizations. Even with allocated funding, often times the pace is painstakingly slow or the **commitment from researchers needs to be reaffirmed** at different times. Indeed, patenting and licensing does not require much effort on the researcher's part; however, as soon as startup creation is involved, support organisations need to **facilitate the "transformation" of the researcher to entrepreneur**, or pair them with qualified business professionals.

Another challenge is related to the **skills needed to support researchers in the exploitation of their research results**. Support organisations are often required to offer different kind of services such as support for patenting, licensing or entrepreneurship. These services are different and require different knowledge base and skills, which are difficult to be fully mastered by one person. Often, internal support organisations have limited resources to offer competitive salaries to their personnel and therefore cannot always recruit candidates with a senior profile or with previous experience in startups or industry. Therefore, the personnel does not always know the business world well, which render their task more difficult. As a result, the organisations may lack the resources and capabilities to drive innovation activities proactively with universities/research institutes. Of course, there are exceptions.

Finally, many public support organisations have evolved through some type of bureaucracy (often universities). As such, they are well organised but they **lack the flexibility and responsiveness that a business would require**. Although they can be helpful at the early stage of exploitation, later on, they have difficulties to follow the fast pace that is often required in business. Also, funding sources that they can rely on to support entrepreneurs are often slow and not flexible. There are few countries where it takes a few weeks instead of close to a year to get a grant worth half a million. The business world is fast and so should become the world of grants.

Startups / SMEs

For startups there are numerous challenges but the usual suspects are **commercialization strategies, funding, and IP concerns**. Startups, especially health related ones, must address complex regulatory issues and deal with long pathways to market that are high risk. The innovation therefore must be

very compelling, of interest to the market and owned by an entrepreneurial minded researcher. In addition, there must be a **solid co-founding team**. More often than not, the startups assisted through H2M were lacking in some form of business knowledge or expertise on the founding team. They really need someone who is business oriented and can devote the majority (no less than 80%) of their time pursuing this endeavour; however, many Startup and SMEs seem to not understand this need, seeing their entrepreneurial endeavor as a part-time job, or something to do in their free time. Furthermore, some founders would like to retain full control of their idea/exploitation, and find it difficult to accept a cofounder. While there is some public support schemes, (e.g. EXIST in Germany) matching founding teams with this expertise is a difficult task.

Another common problem is also one of **perspective**: most of them really **focus on how great their product/service/solution is but they neglect to dig deeper and find what type of need it serves and for whom**.

Startups, SMEs and support organisations have followed the e-training courses in lower numbers, with a higher preference demonstrated for the training course on *Business Ventures and Marketing*. This course focused on those entrepreneurial skills which can best be described as “soft”, as opposed to technical skills, or economically focused. Besides from a new set of technical skills, it is only natural that transferring from research to business requires a change in the mind-set of an individual. The lectures also gave a preliminary knowledge on understanding the customers’ needs, on the processes of segmentation, targeting and positioning, on brand identity, pricing strategies and marketing channels. This should not surprise, since individuals launching startups have already made the first step to move from academy to business, but may still need advice on how to succeed in their endeavour, which might be hindered by their maintenance of an “**academic**” mind-set.

Finally, **for startups the main difficulty lies in retrieving information on and reaching out to researchers as well as to support organisations**, and to know which support organisations exist and which type of support they may provide. Interaction within the ecosystem is, in other words, well below the needs of European society. Also, SMEs lack funding to pay for specialised support support (e.g. regulatory or clinical trial strategy), yet they are often quite reluctant to get support offered free of charge by publicly-funded projects (like H2M or others). SMEs also tend to ask for support too late, blocking or limiting development opportunities. This has also been noted by the European Medicines Agency, EMA, in their analysis of the Marketing Authorisation Application (MAA): “...to date, the success rate of SMEs applying for MAA has been below the average when compared against all companies applying for MAA. Some of the reasons SMEs fail to win approval is the need for additional clinical data to support the application, better quality management and documentation, or premature filing. Moreover, **many SMEs are seeking advice too late in development stages rather than at the beginning.**”²

² Source: Annual Report from the SME Office - 2014 ; reference: EMA/699351/2014 (http://www.ema.europa.eu/ema/index.jsp?curl=pages/regulation/document_listing/document_listing_000116.jsp&url=menus/regulations/regulations.jsp&mid=WC0b01ac0580024b9c)

Collaborative projects

It is also important to analyse specifically the case of utilisation of research results from collaborative projects such as European research and innovation projects but not only. The main issue with the utilisation of research results from collaborative projects is related to the “collaborative” aspect of the projects. Indeed, partners have to agree on the best exploitation path(s) but this is not always easy when they **face potential instances of conflict of interest** like publishing vs IP protection; commitment to industrial issues vs investment into academic self-governance and networking; etc. Furthermore, typically **partner selection typically is not primarily based on exploitation needs**, but on other non-exploitation criteria (such as personal network relations, geographical coverage, appeal for evaluation, etc.), thus making it more difficult to find the right partners for exploitation efforts within a consortium, especially those who understand both the exploitation issues and the research side of the project. To this, one can also add **a difference in culture and expectations between research and industry**. Particularly, (large) industrial partners are bound by internal policies and other restrictions. Moreover, highly desirable commercialization actors (e.g. large pharma, fortune 500 companies) are difficult to secure as consortium partners or the process is overly long. Some of them are overly secretive thus limiting candidness and evaluation of other opportunities. The **culture difference between different countries** is also not to be taken lightly as national approaches and starting points with regard to exploitation are quite different due to different cultures, experiences and public (financial) support for exploitation. Therefore, more diverging expectations and objectives than in nationally homogenous consortia make conflict of interest even more likely.

Besides these difficulties inherent to being in a consortium, there are also **strong issues with the potential time to market from projects’ results**. Project results at a **technology readiness level of 2 to 5 are typically too early to be taken up by the industry** because often the time horizon is still 7-10 years. Also, multinationals in a number of industries have become increasingly risk-averse, pushed by short stock market cycles and shareholder pressure. Furthermore, the optimal commercial value of a technology is difficult to define, because **many projects have no or insufficient budgets to follow through with patent analysis, market analysis or professional support for developing promising exploitation strategies**. Often, partners are reluctant to involve “imposed” external specialists – those who are proposed by the authorities or provided by publicly funded projects. **Exploitation needs trust and time is needed to “earn” it.**

Finally, it has been noticed that **exploitation efforts start quite late in the project** (often only after the second half of it), blocking or limiting certain options within the process.

4.2. Drivers for entrepreneurship and utilisation of research results

Researcher

The drivers for researchers to utilise their research results will vary depending on each researcher and can be summarised as follow:

- **Earning potential.** Often times it is motivated by personal gain, in terms of prestige by adding to their patent filing, or from the potential to personally profit from the innovation. While there may be altruistic motivations related to their life’s work (third point below), the

potential to monetize their innovation is a motivating factor that should not be underestimated.

- **See their ideas being implemented at a large scale.** Indeed, to some researchers, the potential exploitation of their lifetime's research is a huge motivating factor. The researcher wants to value his/her research for himself or herself in an individual process of public recognition of expertise. These profiles are generally technology-driven.
- **Improve society's health and well-being.** The project holder wants to "change the world" by righting a wrong or creating meaning for people and the society with the proposed offering, which is the core anchoring of an entrepreneurial mind-set. These profiles are generally market-driven by addressing an underserved or unmet need.

Support organisations

The main driver for support organisations towards entrepreneurship and utilisation of research results is that **it is their mission**. In some cases, other motives are at play. For example, for some external support organisations that have a different business model than university support organisations, having access to innovations that are beyond the state-of-art is not only inherently interesting but **provides opportunities for additional business acquisition** in terms of market studies, renewed exploitation contracts, and in exceptional cases, the opportunity to invest or cooperate further.

Startups

Startups often base their first product on an innovation originating from academic research so entrepreneurship and utilisation of research results is key. Later on, they have to use new innovations to continue their growth. Therefore, their main drivers are:

- To **become viable** and earn revenues. It is also a chance to receive financial gains and to develop into an important and well-recognised player in their field.
- To **grow into large firms**. Past the initial stage, the entrepreneurial project is related to market or product/market domain and capture growth opportunities.
- To **multiply their value**. Both in terms of market capitalization as well as creating value for investors, shareholders, employees, and the markets they serve.

Last but not least...

Passion and motivation are key. The road to entrepreneurship and a successful business is long and perilous where one needs to stay motivated and perseverant. There never is an easy exit waiting around the corner, on the contrary, there is a lot effort needed either to sell an innovation to a Big Pharma or to establish an operative startup.

4.3. Supporting researchers, innovators and startups

Support to researchers/innovators is key. Support from university/institution and from the outside is absolutely necessary and innovators need to surround themselves with peers and advisors who

understand the issues that concern healthcare and entrepreneurship. The value of these connections can help innovators along the entire process including personal introductions to people who can help them further along the exploitation value chain.

Intellectual Property Rights

During the trainings and services offered to the health research community during the project, it was evident that there was a **lack of knowledge/ information to the researchers about IPR possible arrangements** that may apply. However, **most researchers understand that IP protection is an important component of successful commercialisation** as without patent protection, many technologies cannot be commercialised. Entrepreneurial innovators particularly recognize the value of "patent pending" status or issued patents covering core technologies. Investors are generally unwilling to bring products to market if those products can be easily and quickly copied by competitors with no available remedy. Surprisingly, the e-learning training course on Intellectual Property and Ethics registered the lowest number of participants, thus showing that these issues are likely not considered as current challenges by the Health/Life sciences researchers themselves.

Having said that, researchers and young entrepreneurs often view patent deposit as a prerequisite for market strategy when they should view it the other way around: **it is the market strategy that drives IP**. This wrong idea is further amplified by the fact that researchers were asked in recent years to patent their results but were not asked to provide a sound exploitation plan. This is changing, for example in Horizon 2020, project proposals must emphasize the impacts their potential results will have and what steps they will follow to bring them towards commercialisation. It must show how the innovation will be delivered to market and how the go to market will be evaluated.

IPR is a difficult and often times complex subject that encompasses strategy, financial resources, freedom to operate, and negotiation. It can also run the gambit from "is this novel to patent protect?" to negotiating patent ownership with the associated university or another third party inventor. Being able to explain to researchers why IPR is important is the first step followed by ascertaining what is needed to their particular case. For example, helping them formulate a patent analysis of their innovation in preparation to file a patent, formulating a patent strategy taking into account their innovation, commitment (both from the university and supporting organization), finding funding to file the patent, and determining what to do with the patent after filing.

Researchers quickly understand that publications per se are not sufficient in and of themselves to generate utilization of their research results in terms of value creation in society. Given that research is a means to an end, it becomes clear that the use of IPR is an ethical obligation of researchers to ensure that their research results can attract the further investment needed to utilize in society. The recognition that utilization (and the role of IPR) is an ethical obligation for researchers is a key step in institutionalizing IPR/innovation activities in the research process. Additionally, the recognition that an utilization/innovation approach to research generates better opportunities for research funding, especially as funding organizations increasingly focus on "impact", is another key step in the process to integrate research and innovation processes.

Entrepreneurship and business planning

Similar to IPR, this issue is complex and unique to the exploitation case. Even when researchers/entrepreneurs/startups are quite advanced and have a business plan, clinical trial strategy, market access path, industry cooperation, etc. they will need **continual guidance**. Ideally from a provider that has a long term view of being able to plan, assist, and problem solve as they move along the valorisation pathway. In addition, often times they require very specific, competency based knowledge assistance. For example, how to formulate a clinical trial strategy, seek all the approvals, and coordinate this with certification of the medical device so as to avoid delays or recertification. One of the lessons learned is to **test the startup assumptions**. E.g. is the planned business model the right one or is there a better alternative they haven't considered? Is forming a startup the best option for the case?

Another important lesson learnt is that **researchers' business plans have a tendency to stay at a conceptual level and are not confronted to the reality of the targeted market**. Entrepreneurs are innovators who introduce an invention into a social milieu. For an invention to succeed, knowing the targeted "milieu" is key; however, often times, market knowledge of stakeholders is limited to the close proximity of the project holder and knowledge of the whole scope of contingencies (the market forces) that may impact/leverage the project is very limited. Moreover, when the knowledge exists, there is very seldom an appropriate methodology to get useful information for practical decision making. As regards to business modelling and business development issues, stakeholders tend to stay on the concept side and tend to postpone the "learning by experiencing" in the marketplace with final users. This translates into conceptual business plans that cannot build on field-based legitimacy. Therefore, it is fundamental to force them to confront themselves to their end-users.

Marketing

One of the challenges and lessons learned is that often there is **a lack of marketing focus**. Moreover, it is exceedingly difficult for researchers to articulate a clear, specific, and compelling value proposition. To the researchers/startups, their value proposition is clear but it may not be the case to others (outside of the project). Therefore, being able to distil the value of their product or service and unique competitive advantage into something that is clear and obvious to potential stakeholders such as funders or customers is an important part of assisting them. It also sets them up to talk to others, university, investors, business competitions, asking for outside help, etc. when they can articulate this.

Another lessons learned is that researchers don't need a product or polished prototype to start marketing. **Being able to market their idea or innovation will help them to validate their idea**, gauge initial interest, receive publicity, which in turn will motivate all stakeholders.

To summarise, when assisting researchers with the exploitation of their research results it is key to constantly remind them to think about:

- **For who is their product/service/solution relevant?**
- **What needs exactly does it serve?**

- **How should they frame their offering so that it is obvious that it addresses specifically and measurably those needs?**

In general, they always adopt a company perspective, and they must be constantly be "pushed" to be more **customer oriented**. They are also very cost-oriented, which can lead to great decrease in profitability and viability.

4.4. Support via an e-learning platform

Nowadays, **research organisations** in Europe are looking for ways to **diversify their income sources** as much as possible, so as to be able to continue work independently from students' fees or state aid. For this reason, an increasing number of researchers are struggling to learn how to best exploit further funding opportunities that will allow their individual or their organisation's research work. In light of this trend, it can only be natural that researchers are looking to have a deeper understanding of the business world, marketing techniques and of the overall European funding ecosystem. Drivers for startups to participate in this type of e-learning are more field-specific, since the Health/Life sciences field offers innovative products with high market and investment potential. Startup support organisations have an intrinsic driver in being up-to-date on the latest market trends and funding opportunities, since they are striving to offer all information and support that is needed by startups.

Even though an e-learning platform allows for limited interactions with Health/Life sciences researchers, startups and support organisations, it is possible to tell that currently there is a **strong demand for this type of free material to be on the "market"**. MOOC are developing rapidly and they are filling an education gap. The European ecosystem has a considerable need for **learning materials** that help actors to **bridge the gap between research and market**. This is especially true for the topics of Entrepreneurship and Business planning and for Marketing. Projects funded by the European Commission have the potential to exert a significant impact, thanks to their international reach and their wide scope of action.

A major lesson learned is that this material needs to be even more specialised, so as to successfully fill the individual gaps of specific target groups in the first place, and of specific sub-fields, as well. Then again, specialised materials usually have a more limited audience so authors of such materials tend to generalise them to reach a maximum number of people.

5. Policy recommendations

5.1. Recommendations to European policy makers

Out of the variety of challenges described above, not all are accessible for short- or medium-term measures. The change of non-exploitation and pure-science culture in many research organizations will most likely take many years to happen. Also, some of the traits of public administration will not go away anytime soon. And particularly universities' focus on education and excellent research is actually in dire need in a society so dependent on new knowledge than ours.

Other needs, namely the one asking for more or other sorts of funding for exploitation efforts, have already started to being addressed. Horizon 2020 offers more and better tools to support even later-stage exploitation via e.g. the SME or the FTI instruments. Furthermore, the Horizon 2020 programme also emphasizes the importance of innovation and exploitation with notably a critical impact section in the evaluation of Innovation Actions and Research and Innovation Actions proposals where applicants need to clearly define their expected impacts³.

Fortunately, there are a number of needs that can be addressed by supplying researchers and research consortia interested in exploitation of their research with professional advice and support. Not many programs address this problem yet: some instruments like the SME instrument of Horizon 2020 call for the involvement of a business consultant and pay for it. Yet, with professional exploitation support, a number of very concrete needs, which are available to short- and midterm measures, could be successfully addressed, such as:

- Exploitation Risk Analysis
- Brokerage and pitching events
- Exploitation Strategy Seminars
- Business Plan Development

Therefore, the H2M partners have noticed that support at European level is more exploitation oriented than previously. They totally support this shift in the "right" direction and further emphasize this with their **recommendations to continue to:**

- Give grants that are **contingent on business-related objectives;**
- Reinforce support of **innovation actions;**
- Provide **specific exploitation support to funded collaborative projects performing well on their exploitation plan;**
- Align research priorities with the **market needs.**

More specifically related to the implementation of Health-2-Market project, hundreds of organizations from European funded projects (FP7, H2020) were contacted several times over 3-years with free of charge offers of trainings and support services. It was unfortunate to notice that among these only a handful participated in the activities, demonstrating a very low interest (or awareness?) for the exploitation of their research results. Further discussions with some participants in FP7 projects shows the following (informal) feedback: (1) large industrial firms have resources to implement the exploitation efforts and do not need exploitation support; (2) SMEs with experienced

³ <http://sciencebusiness.net/news/77101/Commission-lays-out-plans-to-manage-low-Horizon-2020-success-rates>

staff believe that they know the exploitation routes better than anyone and they might be interested to get a very specific exploitation support from a specialist with in-depth knowledge of their sector; (3) researchers in many cases are willing to do research and are less interested in exploitation activities; (4) startups issued from the EU-funded projects are open to advice but their number is quite limited. As a result, there is a discrepancy between the European Commission efforts to provide the EC-funded projects with exploitation support, and capacity to absorb such support. Interestingly, many participants who took part in the H2M trainings did not originate from European funded projects. It is therefore advisable to be extremely careful when targeting solely exploitation support for European funded projects.

The recommendation “Provide **specific exploitation support to funded collaborative projects performing well on their exploitation plan**” requires particular attention and perhaps a study from the European Commission. Such support might be an incentive for the participants in the EU-funded projects to start exploitation activities earlier and to increase success and openness to external specialised advice. Options could be, for example, to allow (small) project extension, focusing on exploitation, to those performing exploitation activities well; to provide “vouchers” allowing purchase of exploitation support for this extension from very specialised exploitation providers, etc.

5.2. Recommendations to National and/or Regional policy makers

National and regional policy makers have a key role to play in the exploitation of research results. They already support technology transfer offices, universities and business schools, incubators, young SMEs, clusters, etc. The list is not endless but it is very large.

The first item they should address is the own mind-set of academic researchers who are not business oriented. However, it is difficult to change someone’s mind-set and it is easier to instil a business mind-set in younger people. There is a need to **prepare future health scientists to the ambidexterity of exploring and exploiting opportunities**. One way to do that is to include a **mandatory teaching at undergraduate levels about entrepreneurial mind-set for exploring opportunities and capture value through business venturing**.

Policy makers should also **provide more support and possibility for open access e-learning resources and may give more visibility to the existing sources**. A well informed and connected academic community will have a cascade effect on the entire region, indirectly benefitting also the whole country. It is important to offer locally specialised e-learning courses, which could also spread information on the existing local ecosystem. At a national level, the scope should be widened, so as to enlarge the amount of information to the nation-wide academic community, as well as the national market and funding opportunities.

National and regional policy maker should also be extremely strict in their selection of young SMEs/startups to support and how to support them. One way to do that would be to implement **“crash test” sessions to validate the relevance and solidity of business models and BP of entrepreneurial projects**. Such “crash test” could be a prerequisite to the allowance of public funding or public support. In so doing, policy makers would substantially save time in helping entrepreneurs to quickly allocate the right efforts to the right topics, thus leverage the survival rate

of incubated projects and accelerate the growth of new ventures. Another way could be to organise innovation fairs where big pharmas and SMEs could meet.

Finally, many startups experienced a valley of death when they don't have enough money to continue their technology development into a marketable product. They are past the seed investments and prior to growth capital. There is a strong need to bridge this valley of death and national and regional policy makers should strongly **support bridge financing**.

5.3. Recommendations for universities

In most academic's systems, researchers are evaluated and promoted almost exclusively through their scientific achievements such as their number of scientific publications. For the past few years, their number of patents may also have been taken into account for their promotion; however, a patent is not the exploitation of research results, it is even an expense for the university. It is neither conducive of a change of mind-set (as mentioned above) neither conducive of an increase exploitation of research results. To remedy it, **academic systems could adopt an incentives' system that acknowledges successful exploitation in the same way that it acknowledges successful research**. This requires the recognition that innovation is at least as difficult as research in terms of achieving results.

In the same line of thoughts, **researchers could be trained to the essentials of strategic management of innovation** (i.e. using innovation to achieve strategic objectives: new market opening, differentiation from existing solutions, price-competitiveness) using examples of success stories and failures but also via "startup coaching" experimentation where researchers would use their knowledge to coach other researchers. Teaching business modelling and business planning through action learning is key. Furthermore, **entrepreneurship courses could be integrated with more depth in PhD curricula**.

Finally, **academic's systems could provide incentives and actively support the creation of startups**. This could be done with ways for researchers to have some time-off from "active duty" (research and teaching requirements) and positive support from the entire scientific community from his/her university (continued access to lab space/office space, support valorisation team....). Universities could also make it easier for a researcher whose startup just failed to get back into his research institution thus reducing the risk felt.

5.4. Recommendations for technology transfer offices and other support organisations

As seen above, technology transfer offices have many different jobs and need many different skills, yet they should find a way to **provide tailor-made services to health researchers, especially regarding legislation/ regulation issues**. Indeed, medicinal products and devices are amongst the most stringently regulated products in Europe and abroad. As complex as these regulations are, it is

fundamentally necessary that researchers actively address them throughout their innovation processes. However, they cannot do this without support.

Another challenge researchers are confronted to when wishing to exploit their research results, is a general lack of knowledge and skills on how to exploit their research. It is often easier to support someone locally and therefore technology transfer offices and other support organisations should **focus on the provision of customized training services**. They could also provide opportunities to match researchers with people from the business side. This includes people a researcher can team up with in order to create a venture.

Often times, support organisation are focused on short term earnings as they have to justify their funding and activity but this is just unrealistic in health sciences. There is need for **a long term view and long term gains**.

Finally but not least, one of the main drivers for entrepreneurship within support organisations is to do their job! Yet, it is recommended that they **be passionate when supporting someone!**

6. Annexes

6.1. Annex 1: Training need analysis report

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1 Executive summary

The Health-2-Market project (H2M) is a 3-year Coordination Action aiming **to boost the economic exploitation of research results in the area of Health / Life Sciences**. Health-2-Market aims at providing advanced services and training actions on Intellectual Property Rights/Asset/Innovation management and knowledge transfer to Health/life science researchers who are involved in research projects in Health.

In order to adequately **orient** the project support activities aimed at fostering an enhanced innovation and entrepreneurial mindset of health/life science researchers, the Health-2-Market project team has conducted a **Training Needs Analysis (TNA)**. **The primary objective of the analysis is to determine the researchers' actual knowledge and skills in the field of commercial exploitation of research results and to identify their needs for training in order to overcome the knowledge/skills gap and potentially perceived obstacles and risks.** Indeed training activities are one of the most efficient way, first to encourage researchers to exploit research results and to have an entrepreneurial attitude, second to enhance their skills and therefore to enlarge the rate of success.

The **Training Needs Analysis** is based on the rationale that, before defining the content of the training action plan, it is necessary to define the needs of the researchers and obviously to find out if all researchers have the same needs or if they can be differentiated through several categories.

The **Training Needs Analysis builds on the existing and user-reported evidence gathered in the project's Learning Evidence Base**. The analysis itself has been done in two phases and is in total built on **four sources**, each having been independently analysed beforehand:

Phase 1:

- ⇒ **Bibliographic analysis** of 22 relevant documents/studies;
- ⇒ **In-depth phone/face-to-face interviews** with 26 selected experts (researchers, entrepreneurs, Technology transfer officers, etc.);
- ⇒ **Online survey**, having brought 637 completed responses.

Outcome from Phase 1: draft Training Needs Analysis Report, used as a basis for the next phase

Phase 2:

- ⇒ **2 Roundtable discussions**, bringing together experts in Health research / support (researchers, entrepreneurs, TTOs, Health NCPs, IPR experts, etc.)

Outcome from Phase 2: final Training Needs Analysis Report, updated version of the draft report with findings from the roundtable discussions

The first three sources are complementary to each other: the online survey provides, by the number of persons contacted, some insurance about the findings, the interviews provide qualitative insights to support the analysis and the bibliography increases the volume of available data and provides some guidance. The Roundtables could serve as a discussion and validation mechanism for the findings that were discussed in expert groups.

The respondents to the online survey have been asked to evaluate themselves (Likert scale with five levels of answers: from 1-very low to 5- very high) which has brought evidence on 4 main parameters (variables), namely:

- ⇒ Overall competence (based on their auto-evaluation through 14 competence indicators)
- ⇒ Commercial Awareness (*openness, experience and interest in commercial exploitation topics*)
- ⇒ Institutional Support
- ⇒ Training Interest

According to their respective average notation obtained, **6 homogeneous clusters have been identified**, enabling a classification of the stakeholders/users which need some training support. Three of the 6 clusters have expressed an interest for training activities. Therefore **the draft TNA has been concentrated on the needs of these 3 groups** with respect to business/entrepreneurship training. **The final TNA** includes detailed information on the same 3 clusters, but **comprises also additional information for a fourth cluster (cluster 4)** which will be addressed by promotion on trainings as well.

As the cluster groups differ significantly along the other three parameters (Institutional Environment, Competence and Commercial Awareness), the Health-2-Market approach, training service and expected impact needs **to take into account these differences**.

The TNA has investigated for each of the 14 preset competences, the respective capacity of each user group and therefore the skills gap, if any, to be filled by the training activities. Moreover, through the answers to the online survey, supported through evidence from the qualitative interviews, we have identified the **barriers** – external **obstacles and risks** – perceived by the respondents from the clusters. The training action plan will need to find a way to remove the barriers by providing trust and confidence through success stories, solid packages of tools and practices.

The future training action plan should be focused on the aspects that are influenceable by business training, either by improving researchers' skills/competences or by reducing their perception of barriers. Each identified cluster having specific characteristics, the recommendations for an appropriate training offer will have to take into account their particular needs. Based on these outcomes, the specification of the Health-2-Market training offer will be done as one of the main upcoming project activities. However, the TNA outcomes should not be taken as absolute conclusions and strict recommendations but rather as valuable framework guidelines for the training concept.

All those outcomes, mostly coming from the online survey, have been confirmed, either by the interviews, or by the bibliography and evidence of that has been demonstrated in the whole TNA analysis and validated in the Roundtable discussions.

Also, the TNA provides evidence for general aspects, mostly linked to the process of training:

- ⇒ It is essential to design the training offer with close attention to the expressed needs and to clearly market the benefits that can be expected from the training (return on investment);
- ⇒ Practical trainings should be preferred, leaving the opportunity to exchange on best practices, to discuss case studies and personal experiences and to meet/network with experts;

- ⇒ The *Health* focus on all topics would be a valuable competitive advantage in comparison to existing training offers
- ⇒ The Health-2-Market training programmes should preview a mixed approach in terms of training mode (online/face-2-face); if sufficient participation can be attracted to a face-to-face training, the approach should differ with regards to the target, but be flexible in case of mixed participation groups;
- ⇒ With regards to face to face training, it appears that the concept of one day seminars on the one hand, and one week academies on the other hand, would generally be perceived as an interesting approach; Overall, researchers do not seem to put many conditions with regards to the framework of a training programme – in the contrary to the content that should be designed with close respect to expressed needs and based on the experiences and competences of the different target groups.
- ⇒ The e-learning should be two-fold: part of it should be standalone training, in particular with regards to information that doesn't need interaction with other participants, whereas another part of the modules should be supporting the face-2-face trainings.

2 Introduction

Health-2-Market (H2M) is a 3-year Coordination Action aiming **to boost the economic exploitation of research results in the area of Health / Life Sciences**. The Health-2-Market project aims at providing advanced services and training actions on Intellectual Property Rights/Asset/Innovation management and knowledge transfer to Health/life science researchers who are involved in research projects in Health.

The last 10 years have been a period of substantial organisational reconfiguration in the health sector, and increased entrepreneurial activity has been at the core of that process of change. In the health field exists an abundance of business opportunities but the educational background of life science researchers and health care practitioners provides no exposure to entrepreneurial concepts and only limited exposure to business skills. The European experience has demonstrated that entrepreneurship can be a powerful lever to induce institutional restructuring in the health sector. Entrepreneurial behaviour has long been recognised as the central catalytic element in stimulating industrial innovation, defined as the process of identifying, developing, introducing and commercialising a new product or service.⁴ This is why the Health-2-Market project focuses on bringing about such an entrepreneurial mindset among Health/life science researchers by providing them training support.

In order to adequately **orient** the project support activities aimed at fostering an enhanced innovation and entrepreneurial mindset of health/life science researchers, the Health-2-Market project team has conducted a **Training Needs Analysis (TNA)**. **The primary objective of the analysis is to determine the researchers' actual knowledge and skills in the field of commercial exploitation of research results and to identify their needs for training in order to overcome the knowledge/skills gap and potentially perceived obstacles and risks**. Specifically, the analysis has been conducted in order to:

- ⇒ Determine whether health/life science researchers are interested in exploiting their research results and segregate the heterogeneous group of “researchers” into distinctive homogeneous clusters in order to be able to address them more specifically
- ⇒ Determine which knowledge they already have in the field of commercial exploitation, business creation, etc.
- ⇒ Determine if there is a gap of knowledge/skills to be bridged and to which extend
- ⇒ Determine which barriers are perceived in terms of obstacles and risks in becoming an entrepreneur
- ⇒ Determine whether training could be a prospective means in order to overcome the skills gap and in order to reduce the barriers perceived; determine in which areas such training is needed and effective
- ⇒ Determine the desired training content and framework according to needs expressed

The detailed analysis for training needs of health/life science researchers is an **important basis for further project activities**: in order to maximise the impact of the H2M activities and in particular the planned training actions, the results of the Training Needs Analysis have to be taken into account. The H2M training

⁴ Saltman, R., Busse, R., & Mossialos, E. (2002) “Regulating entrepreneurial behaviour in European health care systems”, *European Observatory on health Care Systems Series*

offers should thus be conceived as a response to the expressed needs and demands and based on already acquired skills and knowledge in order to ensure that the trainings can provide valuable support for bringing health research to the market. By following the expressed needs, it can be ensured that the training offer will respond to a wide-spread demand and bring about effective results in terms of research results' exploitation.

3 From Health research to business: Analysis of training needs

3.1 Methodology

One of the first actions of the Health-2-Market project was the set-up of a “**Learning Evidence Base**”, being a dataset that is continuously updated through the bias of three sources:

- 1) **Existing evidence:** evidence provided through existing bibliographic data, such as reports, papers or studies on commercialisation, IPR and support to the R&D specialists, recent analysis of innovation support infrastructure, etc.
- 2) **User-reported evidence:** evidence gathered through early project activities, such as interviews and an online-survey
- 3) **Practice related evidence:** evidence gathered through project activities, such as trainings and advanced services

In order to conclude on the analysis of training needs, the project team has built on the first two bases of evidence: *existing evidence* and *user-reported evidence*.

In order to gather evidence for these parts of the Learning Evidence Base, **the following sets of data have been set up:**

- ⇒ **Bibliographic dataset:** collection of 107 related documents/studies that can provide information from previous concluded investigations and may be transferred to the field of health/life science
- ⇒ **“Lead Actors” dataset:** this includes a list of contacts counting 381 Users and Lead Actors from 22 European countries; it is composed of entrepreneurs who successfully commercialise health research results, as well as TTO experts active in the field of health/life sciences
- ⇒ **“End Users” dataset:** extensive dataset composed of 7 991 participants in EU funded projects in health, provided through the European Commission DG Research, Health⁵

The three datasets are a main source for the project – either as part of the target groups or by being the basis of literature information. The aim is to continuously update the innovative tool of Learning Evidence Base during the project lifetime in order to ensure the integration of new evidence that may emerge, either in terms of contacts, or in terms of information/documentation/studies. In addition, project activities such as training and advanced services will give input for the practice related evidence.

The following table summarises the 3 different bases of evidence, their sources as well as the steps of preparation and the means of action they are founded on:

⁵ For a question of confidentiality, the content of the dataset of “End Users” has not been provided to the project team, but has been addressed directly via the bias of the H2M Project Officer

Learning Evidence Base	Source	Preliminary steps	Means of actions	Outcome
1) Existing evidence	Bibliographic data: reports, documents, studies, etc.	Gathering bibliographic dataset through collection of 107 related documents and studies	In-depth analysis of 22 relevant documents/studies	<i>Recommendations on training actions gathered through Training Needs Analysis</i>
2) User-reported evidence	Interviews, online survey, roundtable discussions	Set up of lead actors (entrepreneurs, TTOs) and end users (participants in EU funded health projects) data sets	<ul style="list-style-type: none"> • 26 qualitative interviews • Online survey with 637 responses • 2 expert roundtables 	
3) Practice related evidence	Project activities such as training and advanced services	Conclusion of the TNA in order to set up training concept and specify project support activities	<ul style="list-style-type: none"> • Trainings (seminars, academies, e-learning) • Advanced services 	Sustainable training offer

The **Training Needs Analysis** builds on the existing and user-reported evidence gathered in the abovementioned Learning Evidence Base.

The analysis itself has been done in two phases and is in total built on **four sources**, each having been independently analysed beforehand:

Phase 1:

- ⇒ **Bibliographic analysis** of 22 relevant documents/studies;
- ⇒ **In-depth phone/face-to-face interviews** with 26 selected experts (researchers, entrepreneurs, Technology transfer officers, etc.);
- ⇒ **Online survey**, having brought 637 completed responses.

Outcome from Phase 1: draft Training Needs Analysis Report, used as a basis for the next phase

Phase 2:

- ⇒ **2 Roundtable discussions**, bringing together experts in Health research / support (researchers, entrepreneurs, TTOs, Health NCPs, IPR experts, etc.)

Outcome from Phase 2: final Training Needs Analysis Report, updated version of the draft report with findings from the roundtable discussions

The **sources of analysis** have been combined in order to **ensure an extensive and complete view on the issue**: the bibliographic analysis serves as a baseline providing information from previous relevant studies, the interviews are a qualitative means of analysis where detailed and personal views have been covered whereas the online survey can be a proof in terms of quantitative data for the relevance of the information gathered. The Roundtables could serve as a discussion and validation mechanism for the findings that were discussed in expert groups.

The interviews and the online survey have both been addressed to the **following target groups** of the project in order to ensure a view on the question of training needs from different angles:

- ⇒ **Health/life science researchers** (*further on referred to as “researchers”*): the view of individuals being directly addressed by the question of commercial exploitation of research results
- ⇒ **Entrepreneurs in the field of health/life sciences** (*further on referred to as “entrepreneurs”*): the view of individuals having already gone farther by bringing research results to the market through business creation and being able to provide insight information and recommendations
- ⇒ **Technology transfer professionals (TTOs) active in the Health/life sciences fields** (*further on referred to as “TTOs”*): the view of professionals being in direct contact with both researchers and entrepreneurs and having an overall vision based on diverse cases and from an outside point of view

Detailed information on the methodology of the analysis of information gathered through the different sources will be provided in the next chapters. The resulting evidence of the whole analytical work has been synthesized in this document.

3.1.1 Bibliographic analysis

The bibliographic analysis is based on existing evidence in the literature collected through the project’s Learning Evidence Base concept. The aim was to identify relevant information in publications/studies already published and/or conducted for a similar issue in order to identify common relevance. The particular focus was put on relevance with regards to researchers’ entrepreneurship mindset, their business skills and potential training needs. These could come from the health field, but other fields were not excluded in order to seek also for information possibly transferable from other areas.

The project partners have commonly identified relevant literature and scanned for transferability/use of information and outcomes. In total, **107 publications** have been collected in the bibliographic dataset of which **22 documents** have been considered relevant for a **more focused analysis**. The outcomes are a basis in order to substantiate information gathered through the user-reported evidence (interviews and online survey).

3.1.2 Qualitative interviews

Apart from the other means of analysis (bibliographic analysis, quantitative online survey), **26 face-to-face / telephone qualitative interviews** have been held with lead actors (researchers, entrepreneurs and TTOs in the health/life science field), in order to get a more in-depth and personal view. The purpose of the interviews was to gather the interviewees’ personal perception of entrepreneurship, possible obstacles in becoming an entrepreneur and the evaluation of training needs for health/life science researchers.

The outcome is a qualitative view on needs and barriers and an understanding of how Health-2-Market can adapt the training concept consequently and eventually involve the interviewee in the project activities - either as a participant (researcher) or trainer/expert (TTO, entrepreneur).

Specific **interview guidelines** have been prepared beforehand in order to ensure a common structure for the interviews which were conducted by the project partners according to a regional responsibility.

The interviewees have been preselected through the establishment of the lead actors' database, gathered through contact information provided by all project partners (the list of interviewees can be found in the annexes).

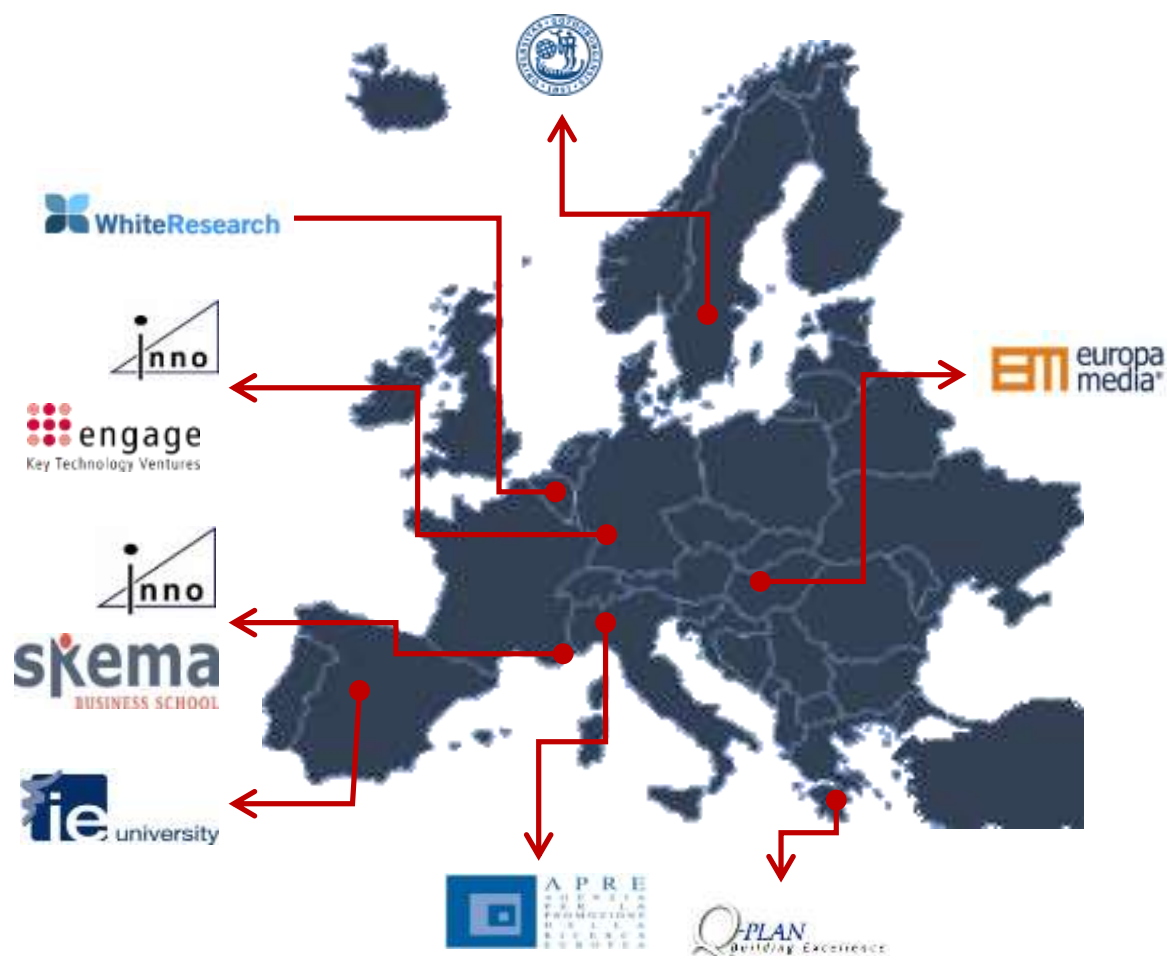
The interview guidelines have as thus been divided according to the three target groups (they can be found in the annexes):

- ⇒ **Researchers**
- ⇒ **Entrepreneurs**
- ⇒ **TTOs** (including technology transfer offices, clusters, investors, ...)

The interviews were divided into **5 sections**:

- 1) *"About yourself"* in order to gather some personal information
- 2) *"About your organisation"* for researchers and TTOs; *"About your company"* for entrepreneurs in order to have a better clarification on the current environment and experience of the interviewee
- 3) *"Your view on entrepreneurship"* in order to understand the perception of the interviewee on this topic
- 4) *"Perception of obstacles and risks"* in order to discuss and clarify what is seen as a typical obstacle or risk in the creation of a business based on research activities
- 5) *"Training needs"* in order to understand the attitude towards training programmes that could be helpful for researchers in the improvement of their business skills

A **geographical spreading** has been ensured through the geographic responsibility and presence of the project partners.



The table below gives an overview of interviews conducted per country:

COUNTRY	Researchers	Entrepreneurs	Technology Transfer Offices**	Cluster**
FRANCE	1	1	3	1
SPAIN*		2	1	
GREECE	2	1		
ITALY	1	1		1
SWEDEN				1
HUNGARY	1		2	
BELGIUM	1	1	1	
GERMANY	2		1	
UNITED KINGDOM	1			
TOTAL number	9	6	11	

"Health-2-Market has received funding from the European Union's Seventh Programme for research, technological development and demonstration under grant agreement No 305532"

*Among the entrepreneurs indicated as being from Spain is one who is active in Spain and USA.

**Technology transfer offices and clusters have been treated jointly in the responses; common interview guidelines and reporting forms have been used.

3.1.3 Online survey

The consortium launched an online survey targeted at health researchers who have been involved in EU health projects. **The objective of the survey was to identify user groups and analyse the needs of these groups with respect to business/entrepreneurship training.**

The survey has been dispatched to a database, accessed through the European Commission Health Directorate, which is composed of 7991 unique contacts of participants in previous health projects. The initial aim was to have at least 50 complete responses – which was overwhelmingly surpassed: **637 respondents completed the survey in full** and the analysis of survey results was based solely on these samples.

In practice, the survey has been made by using Likert scale that is the most widely used approach to scaling responses in survey research.

The **survey's objectives** were the following ones:

- ⇒ To have a descriptive understanding of various aspects of commercialisation and training needs of the H2M target;
- ⇒ To divide the target group into homogeneous sub-groups (clusters) along a number of key characteristics such as demographics, commercialisation attitudes and needs;
- ⇒ The understanding of preferences and importance of different aspects and needs through the analysis of the following aspects:
 - The identification of the parts of the knowledge areas that have a relevant influence on the commercialisation behaviour, for example if skills in market analysis could favour the deposit of a patent, etc.;
 - The identification of the parts of training modalities that have an effect on the intention to participate and/or on the perception of the usefulness of a commercialisation training;
 - The identification of the variables over different groups.

The survey has been divided into 4 parts:

- 1) “About the respondent”
- 2) “Attitudes towards commercialisation”
- 3) “Training needs, skills”
- 4) “Training modalities and participation intention”

The structure of the online survey can be found in the annexes, as well as a selection of questions/answers in the form of charts and the detailed online survey analysis report and an amendment to the report which contains additional information.

At the heart of the analysis was the **clustering analysis**, aimed at dividing the respondents into homogeneous groups (“clusters”):

We suspected that health researchers are a heterogeneous set of researchers made up from distinct groups which “behave” differently along the various business/entrepreneurial aspects.

Four **key variables** were identified as main distinguishing aspects, namely **Commercial Awareness, Institutional Environment, overall Competence and Training Interest**. These 4 variables were a basis for the clustering of the respondents into segments, forming each a homogeneous group. They were also used throughout the survey analysis to empower and facilitate meaningful inferences among these clusters.

The cluster analysis employed the 4 preset variables to study unique subsets and we successfully **identified six groups which differ along these variables. Three of these groups were selected as more appropriate for targeting (based on their potential and interest)**. These three groups share a **high interest in business/entrepreneurial training** (measured in terms of perceived usefulness and willingness to participate). They do, however, show significant variations with regards to the other three key aspects (commercial awareness, institutional environment and overall competence).

In addition, the roundtable discussions have brought up the question regarding a fourth cluster which has been analysed further for this TNA report, even though having shown few interest in training.

The analysis explored a number of angles to increase the understanding of the groups’ particularities and commonalities. As thus, we determined elements that would be useful for the training programme designer for gaining a deep view of the identified target groups and respond to their specific needs.

3.1.4 Roundtable discussions

After having completed the three preliminary analysis steps (i.e. the literature review, the qualitative interviews and the online survey), a first analysis report has been published as a draft Training Needs Analysis Report. The findings of this report have been presented and discussed during two **Health-2-Market roundtables** that took place in Brussels on the 25th and 26th of February, 2013.

The project team has organised these roundtables with the scope to validate with external experts the Health-2-Market findings on the business training needs and skills portfolio of European health researchers, which have stemmed from the previous three sources. Thus, the roundtables execution served the need for a better integration and validation of all these insights for the design of the foreseen Health-2-Market training programme and advanced services towards European Health Researchers.

Consequently, the two roundtables acted exactly on this respect; **as a forum** for the project to present and discuss its findings with significant participants as well as to **shed more light** in corners that were less clear.

In order for Health-2-Market to get feedback in the best possible way, the two special tables were organised with a very specific profile of participants:

- ⇒ **Roundtable 1 consisted of key European Experts and Mediators** supporting health researchers in their business exploitation and valorisation process (i.e. Health National Contact Points, Technology Transfer experts, Innovation experts and so on). This audience has significant experience in supporting the commercialisation of health research, in designing trainings for these topics and a deep understanding of the local and health research specificities.

- ⇒ **Roundtable 2 was devoted entirely to Health Researchers** (from various fields and level of experience). We managed to bring together a multinational team of high level health researchers; these participants were representative of our target group, they were active and aware in both research and health markets and could speak about their own valorisation experiences, too.

Both roundtables followed a similar implementation approach: a brief presentation on the project main findings introduced the participants into the heart of the topics. The presentation was based on the Health-2-Market “Draft Training Needs Analysis Report” that was provided to participants some days before the events as main background document. Then a moderated discussion followed. The discussion was uniformly designed to: i) explain the discussion areas in depth and validate the current findings and ii) ask the participants for additional (to those identified) ideas.

The roundtable discussions took place around the following **three main topics**:

- 1) The validation of the European Health Researchers clustering exercise (i.e. potential target groups of European health researchers and their main characteristics)** as those emerged from the Health-2-Market online survey clustering analysis; in particular the discussion targeted to investigate and validate the existence of the 6 groups identified, their main characteristics, their relevance for the Health-2-Market training programme as well as other potential aspects that should not be missed under this context.
- 2) The European Health Researchers’ existing competencies, knowledge gaps and business training needs leading also to the main training topics the Health-2-Market programme should focus on;** in particular the discussion took place on survey results concerning European health researchers’ business competencies and commercialisation skills; the main knowledge gaps they face in these areas; the specific training topics that Health-2-Market training programme should take into account; as well as specific suggestions on particular topics of interest, such as those related to IPR issues.
- 3) The Health-2-Market training concept and framework and in particular the implementation patterns and characteristics** the Health-2-Market training programme should adopt so as to reassure increased interest for participation by European Health Researchers.

3.2 Analysis of entrepreneurial mindset and training needs

In many increasingly knowledge-based economies, effective managers will need better training in dealing with technologists and in creating business growth and advantage through commercialising technology. Skilled entrepreneurs will be asked to work in collaboration with scientists and researchers as well as with financial managers and venture capitalists. As interest in commercialisation technology has increased, so has academic research interest in this area and as thus there has been an increase in the number of university education programmes that provide instruction in commercialisation of technology.⁶ However, health/life science researchers having specific needs, a targeted training programme offer would certainly be useful.

The qualitative interviews have shown that in general, the interviewed researchers have shown a positive attitude towards the commercial exploitation of services and products in the health's field. Nevertheless the question of interest in entrepreneurship gives quite contrasting answers; some researchers underline the importance of commercialisation in order to gather benefits that may be reinvested in their research triggering a virtuous circle, whereas a smaller part hasn't even thought of becoming an entrepreneur as they believe that it is more important (for society) to fully concentrate on their research topics.

The interview analysis has shown that creating business out of research results in fields "close to the market" as the one of cancer and neurological diseases was much higher than in other fields. However, the motivation for entrepreneurship is particularly related to the market perception: if there is no evidence of an immediate and attractive market (industry interest), researchers tend to draw their personal attention rather to the research passion than to the business opportunities, instead of thinking to create a new market niche.

Founded on the four baseline sources of analysis, the Health-2-Market project team has concluded on common findings that will be presented in the following chapters. The structure is as follows:

1. The homogeneous target groups (clusters) that we have found: their composition, their skills and experiences
2. Entrepreneurship skills/competences that are needed for commercial exploitation, barriers perceived and the skills/knowledge gap that has been identified for each of the clusters
3. The training needs that conclude from the skills/knowledge gap

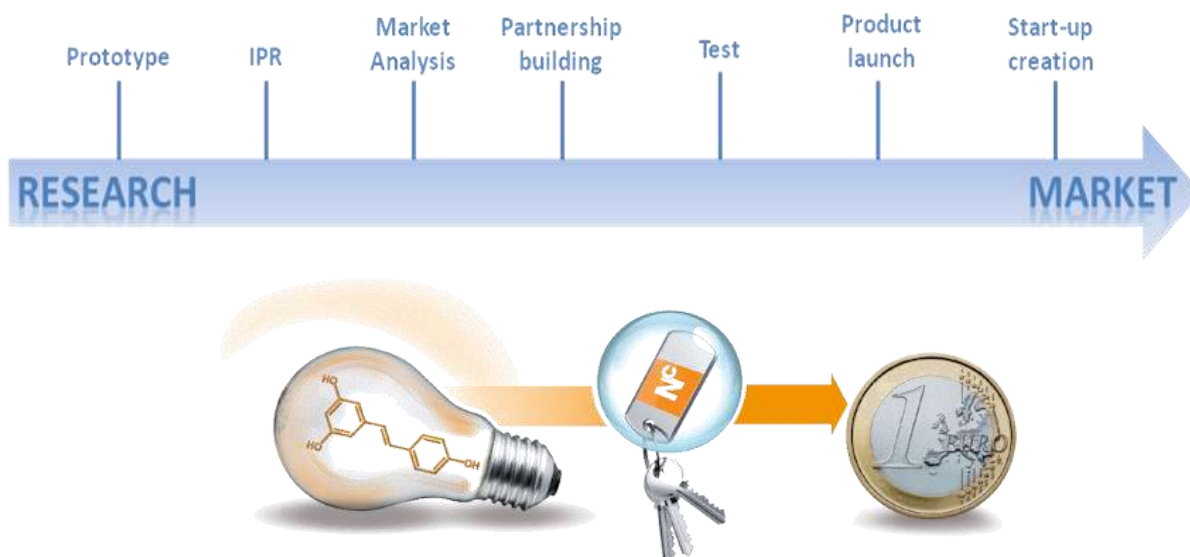
As a conclusion, the analysis seeks to provide preliminary recommendations to what type of training could be suggested for which cluster (target group) in order to acquire the missing skill(s)/knowledge. The objective remains to provide the targeted researchers the most suitable training support to allow them to bring their health research results to the market.

3.2.1 Segmentation of target groups - clusters

⁶ Clarysse, B., Mosey, S., & Lambrecht, I., (2009) "New Trends in Technology Management Education: A View From Europe", *Academy of Management Learning & Education* Vol. 8, No. 3, p. 427-443

In general, it can be said that **the path for commercialising research results comprises different steps, namely:** creation of a prototype, patent deposit/IPR protection, partnership building, market analysis, first line of production at industrial scale, etc. and concludes in the creation of a company, the sales of a product/service, etc. The field of health/life sciences includes particular steps, specific to the field, which may be for example the conclusion of mandatory tests before bringing new drugs to the market.

The figure below shows some examples of steps but is naturally not exhaustive:



When speaking of business/commercial exploitation skills, the different steps described above can be seen as different advancements in terms of expertise towards a “final” competence of successful commercialisation. For example, the deposit of a patent requires knowledge on IPR issues, the action of partnership building requires competences in networking, etc. The lack of these competences can be a serious brake for researchers being on their way to become entrepreneurs which limits their action in terms of successful commercial exploitation of research results.

The aim of the Health-2-Market project is to foster these business competences through specific training. The main target audience for H2M is health researchers who have received EC funding. Although this seems like a homogeneous group, the analysis of the online survey has identified finer groupings based on the different relevant and important aspects with regards to training: all health/life science researchers are not “at the same stage”, as they are not a homogeneous group overall – depending very much on their institutional environment, previous experiences, etc. In order to focus the H2M training offer to the researchers’ needs, it has been considered essential to **divide this large group into homogeneous segments** (further on referred to as “clusters”) that can be addressed more specifically.

As described in the methodology of the online survey, its analysis has brought about **6 clusters, differentiated through 4 variables previously defined:**

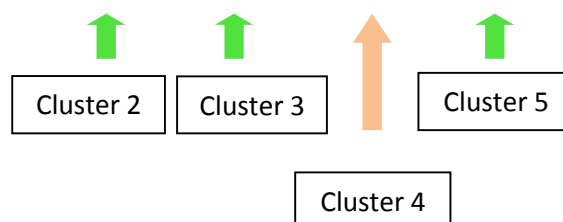
- ⇒ Overall competence (*auto-evaluated skills*)
- ⇒ Commercial Awareness (*openness, experience and interest in commercial exploitation topics*)
- ⇒ Institutional Support
- ⇒ Interest in training

These 4 key variables are an aggregate established through a part of the survey asking the respondents to auto-evaluate their (business) competences and environment: This included questions on how they evaluated particular business skills (e.g. with regards to product launch, business creation, financial aspects, etc.), in what institutional environment they were working and what kind of experience and attitude on entrepreneurship they had. The variable “Interest in Training” is based on the analysis of two aspects, namely “Perceived usefulness of business training” and “Willingness to participate in business training”.

The table below presents the **six clusters identified** along these four variables and presents the mean scores of each cluster on each dimension (1 being the minimum, 5 being the maximum of the 1-5 Likert scale used in the survey). The mean for each dimension is also presented in the final column. Every score that is below the score 3 (the “average” in the 1-5 Likert scale) is marked with red; those that are above three are marked with green.

Final Clusters

	Cluster						Mean
	1	2	3	4	5	6	
Competence	3,0	3,0	2,3	3,4	3,5	2,1	2,8
Commercial Awareness	3,5	4,0	2,9	4,0	4,1	2,3	2,7
Institutional Environment	3,5	2,2	2,5	2,2	3,6	2,2	3,4
Interest in Training	2,8	4,4	3,7	2,4	4,2	1,7	3,4
Cluster Size	105	123	139	60	119	91	



One of the main topics the Health-2-Market roundtable discussions were organised for, was the validation of the European health researchers clustering exercise and their main characteristics. The differentiation of health/life science researchers into 6 homogeneous clusters as shown above is an important base for the following analysis of their skills gap and training needs. Thus, this was an important element the project team has brought up at the roundtable discussions, in order to make sure these clusters are “real” and could be identified by the invited experts – both researchers themselves, as well as specialists working with the target group on a day to day basis. **It has been confirmed that the 6 cluster groups emerged from the Health-2-Market online survey and their main characteristics as shown above “were the right ones”, meaning that health researchers could obviously be divided in such homogeneous groups.** Further discussion elements will be highlighted in the following parts of the TNA report.

Three of the clusters show interest in training, whereas the other three are below average: From these 6 clusters, clusters 2, 3 and 5 seem to have the most potential with regards to the H2M training. These three clusters represent 381 out of 637 respondents, which is nearly 60% of the overall participants.

Therefore, **the Analysis of Training Needs will focus on the clusters 2, 3 and 5 and integrate further information gathered through the evidence from bibliographic analysis, qualitative interviews and the roundtable discussions.**

Cluster 4, even though showing few training interest, seems to have some potential due to their apparent high overall competence and commercial awareness. It will be analysed further on as well in order to investigate whether this cluster has potential as an additional target group for trainings.

3.2.1.1 Composition of the cluster segments

As identified through the online survey analysis, there are 3 clusters that show interest in training offers. However, they **differ significantly along the other three axes (Institutional Environment, Competence and Commercial Awareness)**, suggesting that the Health-2-Market approach, training service and expected impact should differ.

Clusters 2, 3 and 5 do not differ significantly along gender or research experience. No significant difference in the country where respondents work was noted.

Within the online survey, respondents were also asked about what they consider as the aim of doing research. All three clusters share similar beliefs towards producing publications and providing solutions to health issues as goals for research results. Significant differences, however, were identified in “Commercialising health related products, devices and services”; cluster 5 has a much stronger market orientation in comparison to cluster 3 and to a lesser extent, cluster 2.

Among the three clusters that have little interest in training, cluster 4 has nonetheless attracted particular attention: indeed, this cluster has strong overall competences and commercial awareness which are good aspects for the H2M training. However, the little interest in training is an obstacle. This cluster is different in composition with regards to gender (80% male) and age (rather elder) and seems to be differently distributed in comparison to the other clusters with regard to the country of participant’s work. A higher concentration of participants from the Netherlands is noted in Cluster 4 but due to the large number of countries it is not safe to infer any clear conclusion. Respondents are rather experienced in research.

Below is given a concise overview of the main elements on which the 4 clusters show difference – notably the organisation type and affiliations, as well as experience in EU projects:

- ⇒ **Cluster 2:** predominantly individuals working in public organisations, but the environment is seen as not very supportive; people with more than two years EU project experience
- ⇒ **Cluster 3:** large concentration of academics and of respondents working in public organisations, poor scores with regards to the support through their institutional environment; people with less than two years EU project experience
- ⇒ **Cluster 5:** significantly higher percentage of respondents from private organisations and from SMEs, they operate in a very supportive institutional environment; people with more than two years EU project experience
- ⇒ **Cluster 4:** compared to Cluster 5, Cluster 4 has more academics and less SMEs. It “sits” in-between Clusters 2 and 5; there is little institutional support, but the respondents have good EU project experience.

3.2.1.2 Skills and entrepreneurship experiences of the clusters

The above mentioned key variables, through which a clear distinction of the different clusters has been possible, are based on the **auto-evaluation of respondents concerning their (business) competences**.

In the survey we asked respondents to assess their competence along 14 preset areas of knowledge or skills related to the commercial exploitation of research results. These competences are an ideal independent aspect as the H2M training is expected to have an immediate effect on them (increase them).

The questions and evaluation of the **14 competences** are shown in the table below for the 4 clusters we are analysing further:

Competence (auto-evaluation)	Clusters and Means				
	2	3	4	5	Average (including all 6 clusters)
1. Knowledge on how the (health) market operates?	3,0	2,3	3,3	3,4	2,8
2. How to launch new products or services in the market?	2,5	1,9	3,0	3,1	2,4
3. How to take business decisions?	2,9	2,2	3,3	3,5	2,8
4. How does financial management work?	2,7	2,1	3,3	3,1	2,6
5. How can you start a new business?	2,7	2,0	3,1	3,3	2,5
6. How to search for and attract funds for a new venture?	2,8	2,1	3,1	3,4	2,6
7. How to identify commercial opportunities?	3,0	2,2	3,4	3,6	2,8
8. How to secure and protect intellectual property rights for your research?	3,0	2,5	3,7	3,7	3,0
9. How to search (and utilise) data from patent information, innovation information and other sources of knowledge?	3,0	2,4	3,4	3,5	2,9
10. Your understanding of the different ethical issues that exist in relation to your research and its utilisation?	3,7	3,1	3,7	3,8	3,5
11. Your skills in negotiation?	3,5	2,7	3,6	3,6	3,2
12. Your ability to identify an appropriate business model to commercialise your research?	2,9	2,1	3,4	3,5	2,7
13. Your ability to develop a complete Business Plan?	2,6	2,1	3,3	3,4	2,6
14. Your ability to promote the outputs of your research in front of potential clients, investors, partners?	3,5	2,7	3,9	3,8	3,2

The four clusters show the same low-medium-high distribution of competence along most of the areas measured in the survey: Cluster 2 scores rather higher than the average, cluster 3 scores steadily lower, while clusters 4 and 5 score higher.

With regards to **previous experience in commercialisation topics, the clusters show rather big differences:** The allocation of respondents who have started a company and respondents who have received business training differs significantly along the clusters. Also, the three clusters have significant differences along patent application, licensing out and product/prototype development.

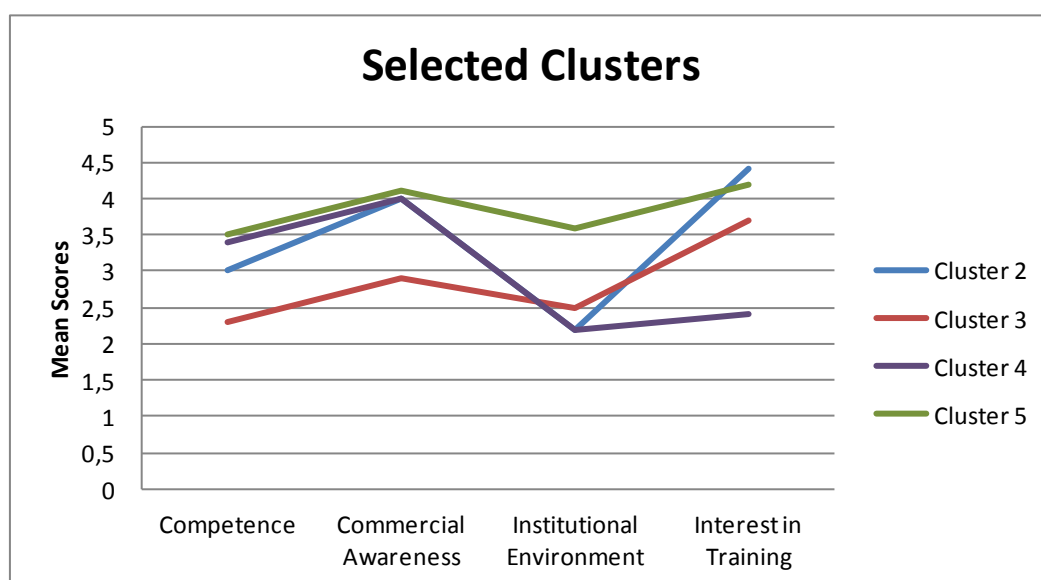
- ⇒ **Cluster 2:** above-average competence and strong market orientation - higher than average percentage of respondents who have previously started a company; half of Cluster 2 respondents have applied for a patent and more than half (55.3%) have already developed a prototype/product; a high number of respondents has previous training experience
- ⇒ **Cluster 3:** moderate commercial awareness - less than 10% have started a company (the least percentage in comparison to the other two clusters), they have evaluate themselves as having poor competence and they have the least respondents with previous business training (15.8%). Cluster 3 clearly lacks in all three aspects (product/prototype, patent, company creation) in comparison to clusters 2 and 5
- ⇒ **Cluster 5:** elite segment with strong competence, commercial awareness and market orientation; significantly more respondents who have started a company, they are more likely to have applied for a patent, to have initiated licensing out and/or to have produced a prototype/product. There are also more respondents with previous business training.
- ⇒ **Cluster 4:** this is also an elite segment with regards to competence, however has rather surprising distinct feats regarding experience in commercialization - unlike what could have been assumed, the members of this group have significantly less experience in start-ups than their counterparts of Cluster 5 (32% vs 45%) and rather comparable to Cluster 2 (29,3%). Cluster 4 stands between clusters 2 and 5 in Patents and Licensing out; the percentage of cluster 4 members having patents and have initiated licensing out is higher than cluster 2 and lower than cluster 5. An important difference, however, is noted in Product Development; Cluster 4 has a staggering 72% of participants who have already developed a prototype/product, which stands out from all other clusters. A large part of its participants have received business training.

3.2.1.3 Synthesis on the cluster segments according to their composition, experiences and knowledge

Overall, we have been trying to identify the main characteristics for each of the 4 clusters, shown through their differences with regards to the 4 key variables:

- ⇒ **Cluster 2** scores above average in competence and has a solid commercially awareness. This group receives very little support from their institutional environment and is likely to welcome our training;

- ⇒ **Cluster 3** scores very low on competence, scores a bit higher than the average on commercial awareness and scores short on institutional support yet they declare a solid interest in receiving training;
- ⇒ **Cluster 5** is an elite segment with high competence, awareness and support that shows great interest in training.
- ⇒ **Cluster 4** is an elite segment regarding competence and commercial awareness, similar to cluster 5, however it shows few institutional support and little interest in training.



The table below summarises the cluster differences and commonalities along the different other categories (some of them will be explained further on, for example the barriers, or categories related to training):

Categories	Cluster 2	Cluster 3	Cluster 5	Cluster 4
• Gender, research experience, country of work	No significant differences			80% male, high research experience
• Type of organisation	Public	Public	Private	Public
• Affiliation	Mixed	Academic	SMEs	Academic
• EU project experience	Experienced	<2 years	Experienced	Experienced
• Training mode preference	No significant differences			
• Willingness to travel	More flexible	Less flexible	More flexible	Not flexible
• Willingness to devote time	Most willing	Less willing	Willing	Less willing
• Perceived usefulness of training	High	Relatively lower	Comparable to Cluster 2	Low
• Perceptions about the aim of research results: Publications	No significant differences			

• Perceptions about the aim of research results: Commercialisation	High	Average	Highest	High
• Perceptions about the aim of research results: Providing solutions to health issues	No significant differences			
• Barriers/Obstacles	Lack of institutional Support	Lack of Interest Lack of necessary skills/knowledge	Lower scores on perceived barriers	N/A

The online survey having been completed by over 600 persons, it can be considered a valuable basis for the clustering into groups, even beyond the respondents. As thus, the clusters 2, 3 and 5 described above have been identified as our main homogeneous target groups for further project activity, notably with regards to trainings. Respondents from cluster 4 will be taken into consideration as well, but with more emphasis on dissemination/promotion of the training activities in order to break through the first step of attraction to trainings.

Even though we could distinguish 6 homogeneous group and confirm them through the roundtable exercises, it has to be clear that the auto-estimation of competences and self-reporting assessment of the respondents cannot be seen as a fix value documenting an absolute conclusion on whether real and objective differences in competence exist (even intra-cluster); both the fact that a Likert scale does not offer a precise assessment of actual knowledge and the fact that these competence areas are very broad by default (e.g. how to take business decisions?) suggest that we should be cautious in how to interpret the clustering results. It is as thus suggested to take this information as a base for the development of a training concept, but to leave freedom for adaption (e.g. if feedback from pilot trainings suggest to review the concept).

In the following chapters, outcomes from the bibliographic analysis and the in-depth interviews will be attributed to the evidence resulting from the online survey and its segmentation of respondents into clusters. As thus, the quantitative data from the online survey can be supported through qualitative ads and based on a larger basis through information gathered in the bibliographic analysis.

As shown through discussions at the H2M roundtables, the aspect of targeting training to homogeneous groups has to be handled with flexibility, according to the training demand we will receive, some trainings may be addressed to homogeneous groups whereas other training groups might consist of mixed target groups.

3.2.2 Entrepreneurship skills and identification of barriers and skills gap

When speaking about training needs, it is essential to analyse beforehand the **skills that are generally thought useful or even essential in order to succeed in commercial exploitation of research results.**

These skills, the competences or the knowledge are related to the different “steps” from research to market shortly mentioned in chapter 3.2.1.

In addition, it should be mentioned that there may be some **obstacles and risks perceived by researchers** that prevent them from “going further” and limit their interest and activity with regards to commercial exploitation of their research results. Even though it seems as if some of these (external) barriers cannot be influenced through trainings, there may be others for which a positive effect can be imagined: for example, if a researcher tightly associates entrepreneurship with financial risks, training in financial and risk management, market studies, information on venture capital, etc. could be helpful not to lower the reality of risk, but the fact that it may be perceived particularly high (positive influence on the personally perceived correlation).

The analysis of interviews, bibliographic evidence and the online survey will be the basis for determining **which skills are needed and where there might be a skills gap to be covered through the Health-2-Market training offer.**

3.2.2.1 Skills to be acquired for becoming an entrepreneur

Commercial exploitation of research results requires a certain number of skills – also called competences or knowledge – depending on the “type” of commercial exploitation the researcher intends to do.

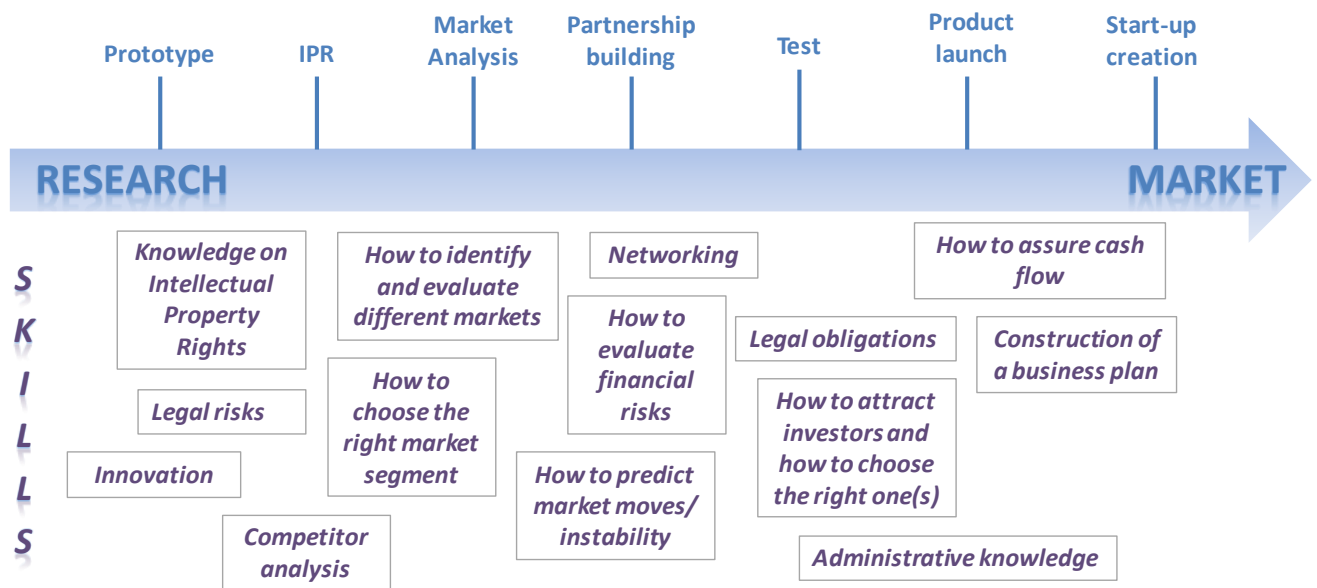
Evidence from the bibliographic analysis has brought about that “the careers in the Health field require the following aspects:

- professionalism
- leadership
- skills
- an understanding of the complexities of healthcare delivery with its specialised language, financial structure and politics.”⁷

Considering that researchers who wish to successfully commercialise their research results have already acquired high competence with regards to their field of excellence and general managerial/communication skills, we concentrate on the “business skills”.

The figure below gives some indication on **skills/competences required for different activities of commercial exploitation** (non exhaustive indication of activities and skills). In general, it can be said that activities regarded as “closer to the market” (farther to the right part of the chart) require knowledge of the steps before (left part of the chart), as these steps are often taken beforehand. For example, creating a start-up requires supplementary skills in comparison to the deposit of a patent.

⁷ Career Guide: “Office of Health Professions Advising”, *Healthcare Management* retrieved from “Purdue University”



If we take the above identified skills to be acquired for becoming an entrepreneur and we compare to how the analysed cluster segments have auto-evaluated their competences, it should be possible to conclude on a skills gap. The training offer should thus respond to this gap, even though it has to be mentioned that the scoring of auto-evaluated competences can only give an approach and shouldn't be seen as a fix value to be transferred to the whole cluster group.

3.2.2.2 Barriers: obstacles and risks perceived for becoming an entrepreneur

Entrepreneurship is behaviourally conditioned and some studies have found out that individuals who are ambitious, well motivated and willing to take risks often run up against barriers that inhibit them from letting loose their energies. These barriers are associated with internal goals and the setting of priorities among prospective entrepreneurs. Today a big challenge is to develop efficient activities designed to promote an entrepreneurial behaviour and minimise the barriers involved. In order to achieve this goal, it is important to arrange entrepreneurship training programmes. These programmes' objective should be to help individuals to start new technology-based or knowledge-intensive business.⁸

Outcomes of the interview analysis indicate that even though researchers may prove interest and motivation for the commercialisation of their research results, they sometimes do not only lack of (essential) competences/skills but may also be confronted with **external barriers**. The interviews' findings on this behalf have been confirmed through the roundtable discussions with both researchers and innovation experts.

The qualitative interviews with entrepreneurs have shown the general opinion that there are many opportunities in the health market, especially in cancer and diagnostic monitoring, but that in some

⁸ Groen, A., Oakey, R., Van Der Sijde, P., Cook, G., & Klofsten, M. (2008) "Supporting Academic Enterprise: A Case Study of an Entrepreneurship program", Chapter 5 of *Technology-Based Firms in the New Millennium*, Volume VI

countries there is a lack of help from legislation (example of Greece) and other structures that make the exploitation of an idea difficult. TTOs consider that there are a lot of entrepreneurial opportunities, especially in the market of medical devices and advanced therapies. They mention the positive effect of support from business angels, clusters and incubators on the growth of entrepreneurial opportunities.

Even though apparently there are entrepreneurial opportunities in the health market and diverse support structures can provide assistance, the outcomes of our interviews have shown that researchers fear commercial exploitation because of the **risk** they associate it with. The highest risks perceived by researchers are related to financial and legal aspects and this is the reason why many of them stated they were not ready to invest their own money. A smaller but still relevant part referred to risks related to cash flow and the difficulty to make a company sustainable beyond the critical fifth year. Another group stated the risk related to the current economic crisis context.

The major risks from the entrepreneurs' point of view are related to the investment of money, time and energy into something that "might not work" and the financial risk like bankruptcy. A smaller part referred to the risk related to the prejudice in the career "if the idea is not successful". TTOs mentioned financial risks and the ones related to the cash flow.

When bringing up this topic during the roundtable discussions, financial risks were indeed the main obstacle perceived. Ideas on risk sharing came up, e.g. through "matching" a health researcher with a business-profiled person right from the beginning of the commercialisation process in order to form a "pair" with competences both in the technical/scientific field and in the entrepreneurship tasks. Also, regulatory/legislative aspects were perceived as an obstacle, however, being rather particular for the different countries, these aspects would have to be covered on a rather national level.

In the online survey, respondents were asked to agree or disagree to whether several preset obstacles or barriers could prohibit them from commercialising their research:

9. 4. Which of the following factors do you think might be an obstacle or a barrier for you in commercialising your research activities?						
	1-Strongly disagree	2-Disagree	3-Neither	4-Agree	5-Strongly agree	Response Count
Lack of interest	10.5% (67)	33.4% (213)	24.2% (154)	24.8% (157)	7.2% (46)	637
Lack of institutional support	3.6% (23)	18.5% (118)	22.8% (145)	34.7% (221)	20.4% (130)	637
Lack of the necessary knowledge / skills	7.2% (46)	21.8% (139)	22.1% (141)	38.9% (248)	9.0% (63)	637
Lack of funding	1.3% (8)	5.5% (35)	13.5% (86)	45.5% (290)	34.2% (218)	637
Significant risks	3.6% (23)	11.6% (74)	29.0% (185)	39.7% (253)	16.0% (102)	637

The clusters 2, 3 and 5 share similar opinions towards lack of funding and (overall) significant risks; their opinions differ significantly along three other obstacles: lack of interest, lack of institutional support and lack of necessary knowledge and skills.

Cluster 2 is particularly troubled about the lack of institutional support. This shows that the respondents from the cluster that has been identified as having little institutional support (cluster 2) are particularly worried about it and see this as an important barrier that prevents them from entrepreneurship activities. The respondents from the cluster that has auto-evaluated itself as rather competent in business skills (cluster5) are well less concerned by this potential barrier.

3.2.2.3 Skills gap

According to evidence from the bibliographic analysis, individuals setting up a new business are often inexperienced, have no employees, lack sufficient funds or a developed network. Their business ideas are usually vague, but the driving forces are strong. As a means of support, studies/literature propose some programmes that aim to minimise these barriers in order to encourage individuals to take the step to become entrepreneurs, increase their self-confidence and at the same time give them professional aid to realise these goals. These training programmes are fundamental for potential entrepreneurs because they help them to structure their own business development work, to have access to a network of experienced entrepreneurs and also to get professional treatment and feedback on their ideas.⁹

As mentioned above, it is of particular interest to provide training support in order to overcome both the researchers' **skills gap and perceived obstacles** as they are often closely linked.

The interview analysis has brought about the main hindering from commercial exploitation outlined by the researchers:

- the lack of knowledge on how to commercialise a product/service or “how to do business”,
- their lack of marketing knowledge,
- the lack of knowledge on “how to network”,
- the lack of administrative, financial and marketing knowledge, as well as
- the barriers relating to the legislative and legal framework (for example some Greek researchers said that in their country there is an incompatibility in being at the same time a professor and an entrepreneur) and
- the difficulty of finding financial funds.

The entrepreneurs mentioned in particular the Protection of Intellectual Property Rights, the lack of funds and the legal difficulties as main obstacles they had to deal with.

From the TTOs' perspective the major obstacles are related to the lack of funds, the lack of administrative knowledge, the lack of information on how to attract investors in order to get funds and difficulties related to the prediction of the market's moves and finally the lack of network and of knowledge on “how to network”.

This analysis shows, that the main aspects commonly mentioned by all three groups of interviewees relate to financial issues: 'lack of funds' can hereby be seen as 'lack of knowledge on how to attract funds'.

⁹ Groen, A., Oakey, R., Van Der Sijde, P., Cook, G., & Klofsten, M. (2008) “Supporting Academic Enterprise: A Case Study of an Entrepreneurship program”, Chapter 5 of *Technology-Based Firms in the New Millennium*, Volume VI

A main part of the online survey comprised the auto-evaluation of competences – inherently including as thus the evaluation of a lack of competences when respondents put a low score (see again the competences table in section 3.2.1.2).

The roundtables discussion that took place around these results targeted to provide insights on the main gaps researchers face in these competence areas, and thus the specific training topics that the Health-2-Market training programme should focus on and definitely not miss. Furthermore, specific suggestions were gathered by participants on topics of particular interest, such as those around the IPR related competencies and training needs, as well as for additional topics not included in the 14 preset areas of knowledge (e.g. regulatory aspects, etc.).

The main outcomes of the roundtable discussions are provided below:

- Most of the comments of roundtables participants were focusing on the areas:
 - 1 (*Knowledge on how the (health) market operates?*),
 - 2 (*How to launch new products or services in the market?*),
 - 6 (*How to search for and attract funds for a new venture?*),
 - 7 (*How to identify commercial opportunities?*),
 - 12 (*Your ability to identify an appropriate business model to commercialise your research?*),
 - 13 (*Your ability to develop a complete Business Plan?*) and
 - 14 (*Your ability to promote the outputs of your research in front of potential clients, investors, partners?*).

Those were actually found as the most problematic ones for Health Researchers (i.e. the areas where Health Researchers have the higher knowledge gaps and thus, the areas that should be targeted as particular training topics by the Health-2-Market Training programme).

- In particular, the areas 12, 13, 14 were considered by some participants as a group of areas in which Health Researchers face the most significant problems (i.e. being even unaware of the context and/or the notions of terms like: “business model”, “business plan”, etc.). In addition, for most of the researchers their weakness in these areas is not always evident to them.
- With respect to IPR (areas 8 and 9), it was mentioned that Health Researchers are generally aware of the patenting issues (since several of them or their colleagues have patented research results in the past). Overall, participants found necessary for Health Researchers to have a general understanding of the IPR topics and the steps required so as to be able to decide when they need a specialist for a specific IPR/patenting case. Overall, trainings should present to researchers through specific cases the different variances that exist so as not to be afraid to take the necessary steps when needed and to understand the “language” a specialist would talk (business terms, etc.).

However, the roundtables have also highlighted areas of competencies that were missing in the online survey catalogue, in particular the regulatory environment and its related aspects (e.g. national, European and international legislation and constraints e.g. for clinical trials, ethical approvals, certifications required, etc). A major missing area (among the 14 pre-set ones) was found to be the regulatory environment and its related aspects that considerably affect the commercialization potential especially of the health / bio-science research results. It was

commented that Health Researchers are not always aware on the importance of the regulatory / legislative constraints that may affect the commercialization potential of their research results at national or international level. Furthermore, even when they are aware of their importance, they face considerable problems on how to investigate the regulations that exist at national or international level and the steps that are required to address them as well as the potential costs to overcome them (e.g. acquire respective approvals, certifications, etc). Therefore, roundtables concluded on the need to include related training topics under the Health-2-Market training programme. The idea should be to indicatively present through specific case studies the variety of problems that may appear in the commercialization of health results due to regulatory constraints and the steps that should be followed to overcome them.

Important correlations between the 14 evaluated competences and the 4 key variables in the online survey reveal that there is a **link between the barriers and skills gap perceived and some of the key aspects** (e.g. start-up readiness). For example those who consider lack of institutional support as a barrier tend to find business training more interesting. Similarly, those with lower overall competence are more likely to see lack of necessary skills as a barrier (and vice versa). The overall picture suggests that these barriers are rather linked to key training aspects and it might be beneficial to try to lift them.

In the table below the significant correlations among competences and barriers are marked with green whereas insignificant correlations are marked with red.

Competence	Lack of interest	Lack of institutional support	Lack of the knowledge / skills	Lack of funding	Significant risks
1. Knowledge on how the (health) market operates?	Green	Green	Green	Red	Green
2. How to launch new products or services in the market?	Green	Green	Green	Red	Red
3. How to take business decisions?	Green	Red	Green	Red	Green
4. How does financial management work?	Green	Green	Green	Red	Green
5. How can you start a new business?	Green	Green	Green	Red	Green
6. How to search for and attract funds for a new venture?	Green	Green	Green	Red	Green
7. How to identify commercial opportunities?	Green	Green	Green	Red	Red
8. How to secure and protect intellectual property rights for your research?	Green	Green	Green	Red	Red
9. How to search (and utilise) data from patent information, innovation information and other sources of knowledge?	Green	Red	Green	Red	Red
10. Your understanding of the different ethical issues that exist in relation to your	Red	Red	Green	Red	Green

research and its utilisation?					
11. Your skills in negotiation?					
12. Your ability to identify an appropriate business model to commercialise your research?					
13. Your ability to develop a complete Business Plan?					
14. Your ability to promote the outputs of your research in front of potential clients, investors, partners?					
Overall Competence					

The barrier of lack of funding is not correlated to any competence (overall marked in red). This means that this barrier is not supposed to be influenceable by training offer as it is an external obstacle, despite perhaps the expectation of a link to ‘how to search and attract funding for a new venture’.

The rather obvious negative correlation of competence and lack of necessary knowledge and skills is relevant for Cluster 3 which has been identified as having little overall competence; it should be duly noted, however, that these correlations are far from establishing causal claims (that higher competence will lead to less perceived importance of this barrier).

In the previous analysis we have identified the competencies that might be associated with the barriers perceived. Competence in certain knowledge areas is something that our training programme can impact and therefore training could indirectly assist in partially lifting these barriers.

3.2.3 Perception and assessment of training needs to overcome the skills gap

Evidence resulting from bibliographic analysis shows that there is a **general scepticism concerning the value of training support**: a lot of companies/organisations prefer to invest money in activities that seem to provide a direct return on investment rather than indirect activities such as training. This is emphasized in particular with regards to theoretical training where participants play a passive role. This way of learning may be inappropriate to those who are more comfortable with “learning by doing”.¹⁰

Other studies that focus their attention on the attitudes of companies towards taking part in support programmes have shown that there are a number of factors which are important for small businesses in particular and they suggest that greater attention should be paid to the real needs of firms. According to that study, important factors determining the success of a support programme were: the existence of a core group of participants, a clear activity focus, credibility and close links with a university. They state that

¹⁰ During, W., Oakey, R., Klofsten, M., & Mikaelsson A.S. (n.d.) “Support of Technology-Based SMEs: An Analysis of the Owner Manager’s Attitude”, Chapter 7 of *New Technology-Based Firms in the 1990s*, Volume IV

there could be a gap between supply and demand as a result of the fact that the support that is given during the training programmes often is not suited to business in general or small firms in particular.¹¹

It can as thus be concluded that it is essential to design the training offer with close attention to the expressed needs and to clearly market the benefits that can be expected from the training (return of investment).

In the online survey, in order to be able to make a distinction among the most important areas of training, we searched for meaningful links among the key variables (Commercial Awareness, Institutional Environment, overall Competence and Training Interest) and the fourteen preset competences.

When comparing the correlations of the 14 preset competences with the main scaled variables in the online survey, it can be seen that most competences are significantly correlated to all of the key variables with some variance in strength of correlation. Overall, the highest correlation appears between Competence (overall) and Personal Confidence and Startup Readiness; a rather less strong correlation exists between competence and interest in training. As a consequence, it becomes obvious that raising the level of competence (auto-evaluated) through the bias of H2M training support, researchers may tend to broaden their entrepreneurial mindset as they gain personal confidence and become more ready to create a start-up (or undergo another commercial exploitation activity).

In the online survey analysis, some differences were identified in **how respondents from the three clusters 2, 3 and 5 perceive the usefulness of business training**. The analysis reveals a steady pattern along both the overall perceived usefulness and the three preset dimensions of usefulness: Cluster 2 has a higher perceived usefulness overall and of business knowledge, hands on training and networking.

	Clusters			
	2	3	5	Average
Perceived Usefulness of business training	4,4	3,7	4,2	4,1
Business Knowledge	4,3	4,0	4,2	4,2
Hands on training	4,3	3,9	4,1	4,1
Networking Opportunities	4,3	4,0	4,3	4,2

Cluster 4, as mentioned already, scores consistently lower than the other clusters in all three preset measures of usefulness showing again their very low interest in business/entrepreneurial training.

3.2.3.1 Needs for training content/topics

According to some studies, companies often judge their availability in terms of time and financial resources to be insufficient when it comes to taking part in support programmes. The same attitude applies to their resources for implementing what has been learned on the programmes: once employees are back in their firms they often lack the time and resources to implement the acquired competence. It comes out that

¹¹ During, W., Oakey, R., Klofsten, M., & Mikaelsson A.S. (n.d.) "Support of Technology-Based SMEs: An Analysis of the Owner Manager's Attitude", Chapter 7 of *New Technology-Based Firms in the 1990s*, Volume IV

they refuse to learn from written material because they rather prefer learning from their own and others' experiences.¹²

It can be concluded that practical trainings should be preferred, leaving the opportunity to exchange on best practices, to discuss case studies and personal experiences.

Some studies explore how companies/entrepreneurs perceive the existing training offer based on their experiences through various support programmes. To study whether a gap between supply and demand exists and to explore how this possible gap can be bridged in order to create efficient business support programmes, the studies conclude on measures that must increase the competence levels of firms. According to these studies, the evaluation of whether a measure is/has been successful should be:

- To increase the number of business start-ups
- To improve the quality of these firms
- To increase the chances of survival of new and existing firms
- To encourage their growth and development¹³

As thus, the Health-2-Market training offer should be designed:

- ⇒ With reference to the expressed and analysed training needs
- ⇒ With the aim to respond to above-mentioned goals.

Answers from the online survey on the question of what the respondents consider to be useful aspects of a training programme has given strong agreement on all three predefined aspects: 80% of the respondents agreed or strongly agreed that such training should provide them with **useful business knowledge**; 71% asked for **hands-on training** whereas 75% of the respondents generally agreed that training should also provide them with **networking opportunities**.

20. 9. In your opinion such training programmes may be useful in:						
	1-Strongly disagree	2-Disagree	3-Neither	4-Agree	5-Strongly agree	Response Count
Providing me with useful business knowledge	2.7% (17)	3.8% (24)	13.5% (86)	64.1% (408)	16.0% (102)	637
Providing me with hands-on training	3.6% (23)	5.2% (33)	19.5% (124)	56.4% (359)	15.4% (98)	637
Providing me with networking opportunities	3.8% (24)	3.9% (25)	15.7% (100)	51.8% (330)	24.8% (158)	637

Through the qualitative telephone interviews we were able to confirm above-mentioned outcomes and have found more detailed evidence concerning **topics/content** for a training programme (main points indicated only).

¹² During, W., Oakey, R., Klofsten, M., & Mikaelsson A.S. (n.d.) "Support of Technology-Based SMEs: An Analysis of the Owner Manager's Attitude", Chapter 7 of New Technology-Based Firms in the 1990s, Volume IV

¹³ During, W., Oakey, R., Klofsten, M., & Mikaelsson A.S. (n.d.) "Support of Technology-Based SMEs: An Analysis of the Owner Manager's Attitude", Chapter 7 of New Technology-Based Firms in the 1990s, Volume IV

When speaking about the needs to overcome the skills gap, researchers stressed the importance of:

- Mentoring/the presence of a mentor (e.g. an experienced entrepreneur),
- training related to financial aspects and market analysis,
- the construction of a business plan,
- networking possibilities and
- training topics related to Intellectual Property Rights.

Entrepreneurs refer to:

- The construction of a business plan,
- training related to Intellectual Property Rights,
- financing issues and
- training regarding market analysis topics.

TTOs mentioned with particular emphasis:

- The importance of topics related to financial aspects and market analysis and
- training/ assistance related to the construction of a business plan.

From all answers from the interviews taken commonly into account, without regarding the different groups of interviewees, the most important aspects mentioned were related to the following (indicated in the order of importance, the most important being on top):

1) Financial and market analysis aspects and in addition, some specific topics were mentioned

- How to improve the chances of survival of new and existing firms
- How to encourage the growth and the development of the company
- Accounting
- Detailed financial planning
- Fund raising
- How to encourage the growth and the development of the company

2) Business Plan construction

- This aspect was often mentioned, even though a majority of interviewees mentioned that the construction of a business plan is a process that needs a longer training duration and closer (personalised) approach.

3) Intellectual Property Rights

4) Mentoring

5) Networking

6) Practical training, including diverse aspects like:

- Case studies in order to share experience and knowledge
- Innovative approach, not “teaching what everybody already knows”
- Training on business models
- Thematic workshops – suggestions comprise:
 - i. related to the different groups/markets: *Medical device, Therapy, Diagnosis*
 - ii. how to handle IP right related issues; what is a patent; how to patent; how to publish a patent
 - iii. from scientists to entrepreneurs

Overall, it was also mentioned by all 3 groups of interviewees that an important training element should be “**to change the mindset**” of the researchers (“Researchers need to learn to think like entrepreneurs, e.g. understand markets and customers' needs”), in order to make them perceptive for commercial exploitation activities and to give them an “outcome orientation” with regards to financial aspects. One interviewee suggested the approach of 3 training levels, each being based on the previous one and being oriented towards such change of mindset in several steps:

- *1st training*: “how to adopt a business attitude” – in particular for those coming from the public domain;
- *2nd training*: “enlarging the market knowledge”;
- *3rd training*: “how to construct a business plan”.

Training topics having also been discussed at the roundtables, the following aspects came up regarding the **scope of the programme**: It was mentioned that the ambition of the Health-2-Market training programme should not be to transform Health Researchers to business, legal or financial experts, but to put emphasis on the following:

- To help Health Researchers change their mindset and learn how to talk a different language - Meaning stop thinking and talking only as researchers, but also as entrepreneurs, putting emphasis on the business / market aspects and understanding of the different “language” employed.
- To make them aware / understand the several notions and terms involved (e.g. on IPR, business, financial, regulatory aspects).
- To provide them with practical examples, cases studies and guidelines on how to address the several barriers and problems that may appear in the commercialization process.
- To provide them with practical exercises on:
 - How to present an idea.
 - How to pitch.
 - How to perform a market analysis.
 - How to investigate regulatory aspects.
 - How to get networked.
 - How to approach investors,
 - Etc.
- To bring investors (VC, Business Angels, etc) in the trainings.
- To provide face-2-face mentoring and networking.
- To present real-life success stories (by bringing the actual entrepreneurs to present them).
- To present cases of failure.
- Finally, to prepare and provide a business training programme that will not be a general one but will be tailored to health market reality and needs (e.g. by focusing and presenting the different business models that exist in reality in health market, by providing real-life cases from the health market, etc).

These elements show that all means of evaluation – interviews, online survey and roundtable discussions – brought a common set of priorities on topics/content which the Health-2-Market training designers should take into account.

3.2.3.2 Preferences for training programme: framework

With regards to the training programme framework, we have analysed different aspects through the online survey and interviews, as well as the roundtable discussions:

- ⇒ **training mode (online versus face-to-face)**
- ⇒ **geographical distance they are willing to travel**
- ⇒ **training duration**
- ⇒ **budget they are willing to spend**

The preferences of the respondents of the three clusters towards the **training mode** (online versus face to face) do not differ significantly. The cross-table below shows the percentages of the cluster respondents along training mode options. The results suggest that the online-based modes are rather less appealing, while the blended approach (50%/50%) is the most preferred, closely followed by approval of a 25% Online 75% Face to Face mode, despite for respondents from cluster 3.

Training Mode	Clusters			Average
	2	3	5	
100% Online	6%	4%	5%	5%
75% Online 25 % Face to Face	5%	13%	10%	9%
50% Online 50% Face to Face	33%	39%	27%	33%
25% Online 75% Face to Face	31%	22%	32%	28%
100 Face to Face	26%	23%	26%	25%
Total	100%	100%	100%	100%

The roundtable discussions brought evidence that health researchers are not that keen on on-line training. However, on-line training could be valuable to support the offline one, especially the academies (e.g. as a follow up to face-2-face mentoring, or as a repository of technical information and material, etc). In addition, it could be used as a tool to help Health Researchers realize and understand their knowledge deficits in specific areas and topics and seek for suitable business training to address them. The discussions confirmed that a certificate for online training wouldn't add another value for participants, concluding that such certificate could be left out.

The above mentioned outcomes confirm that the Health-2-Market training programmes should preview a mixed approach in terms of training mode, combined of face to face and online training. The e-learning approach should itself be two-fold, on the one hand composed on some stand-alone modules/information and on the other hand also bringing supplementary elements to the face to face trainings.

With regards to the **geographical distance** that is preferred by the online survey respondents, it can be seen that the willingness to travel in order to follow business training differs slightly along the three

clusters: Respondents from cluster 3 seem less flexible although the overall willingness (cross-cluster) is rather high (e.g. 52.8% are ready to travel internationally). That fact that there is an overall willingness to travel for business training can be confirmed through the qualitative interviews: Almost every interviewee indicated to be willing to travel at an international level at one condition: the training output (return on investment) has to be clear from the beginning and it must be based on a practical concept.

Time devotion varies along the three clusters. Respondents from cluster 3 seem less willing to invest time in training in contrast to respondents from cluster 2 who are constantly more willing to invest their time in training. The following table shows the answers along the three proposed modes (one day, two days, and five days training):

Type of training	Clusters			Average
	2	3	5	
One Day Seminar	3,8	3,4	3,5	3,6
Two Day Seminar	3,9	3,4	3,8	3,7
Five day Workshop	3,2	2,5	3,0	2,9

Regarding the duration of the programme the answers emerged from the interviews are the following ones:

most researchers stand for a “1 week academy”, half of the entrepreneurs would prefer a “1 week academy” and “1 day seminar”, whereas most TTOs said “1 week academy” and some voted for “1 day seminar”.

The preferences between a one day or two day seminar, in parallel to five day workshops didn't appear very clearly through the online survey. This question has as thus been suggested for discussion at the project roundtables in order to provide input for the development of the training concept. The following aspects occurred:

- **Regional seminars:** It was stressed that Health Researchers are in a “complete” lack of time and thus, training activities in the form of seminars should be very well focused and condensed in time - many participants expressed their preference for one day seminars, rather than two-days, and in easy to access places. It was also suggested those to be organised / combined with other much larger health events so as to attract health researchers participation.
- **European academies:** Their long duration might be a problem for ordinary researchers. Thus, academies should target to invite highly motivated researchers with “mature commercialization cases” in hand. Still, it is seems an important aspect to provide the proper “sweeteners” to potential participants, so as to feel it is worth to invest a full week of their time (e.g. participation of real-life entrepreneurs as tutors and networking with them, venture capitalists, personal mentoring for their case by experts, the opportunity for “free” advanced services and support by experienced consultants, etc).

In conclusion, a combination of one day regional and topic-specific seminars and five-day European-level academies seems an approach that would attract participants.

Regarding the **budget** that researchers would agree to spend for a training programme there are many different points of view, which means that no clear information could be gathered.

In the telephone interviews the aspects that emerged are the following ones: one third of the researchers are not willing to spend more than 500 €, few would spend less than 2000 € and a small part differs from the others, since they are willing to pay more than 3000 €.

Overall, researchers seem not to put many conditions with regards to the framework of a training programme – in the contrary to the content (analysed above). Speaking about the aspects that could prevent them from participation to a training programme, researchers, entrepreneurs and TTOs commonly mentioned the lack of time, the inability to pay and the fear of not having a direct return in terms of output.

When arising the question on competitiveness of the Health-2-Market training in comparison to other training offers, the roundtable discussions brought up that there was a growing market potential for business training addressing national or European Grants requirements. This opportunity could be exploited by the Health-2-Market training programme, so as to both differentiate as well as increase Health Researchers' participation interest to its activities. More specifically, it was noted that:

- HORIZON 2020 puts strong emphasis on Innovation. It is expected that there will be several calls for grants (e.g. for SMEs) that will require more detailed business / market analysis from the researchers applying to them.
- Similarly, at national level, more and more funding agencies put pressure on researchers to include commercialization aspects in their R&D&I proposals.
- Researchers are in many cases desperate because they get pressure from their institutions to acquire grants for their research or business endeavours, while in many cases they do not know how to address these business and market aspects in the Grant applications.
- As a result, Health-2-Market training programme could be positioned as a programme that addresses successfully, not only, the business training needs for mature commercialization cases, but also for researchers interested in addressing research and innovation Grants.

3.2.3.3 Training needs of the analysed clusters

In the following, we are trying to **conclude on the specific needs of each of the 3 most prospective clusters** (cluster 2, cluster 3, and cluster 5, all having shown high interest in Health-2-Market training activities):

- ⇒ to give a concrete outline on their specific interest, based on their competences and experiences
- ⇒ to summarise their specific skills gap
- ⇒ to conclude on the training programme that would be most suitable for each of the clusters

Conclusions on competences and a potential skills gap per cluster have been taken from the following table that permits observations on the skills gap. Obviously, these observations have to be seen as an approximate conclusion, as they are based on the auto-evaluation of competences that are not an indication with absolute value.

Competence (auto-evaluation)	Clusters						Observation of skills (gap) with regards to clusters 2, 3 and 5
	1	2	3	4	5	6	
1. Knowledge on how the (health) market operates?	3,0	3,0	2,3	3,3	3,4	2,0	
2. How to launch new products or services in the market?	2,4	2,5	1,9	3,0	3,1	1,6	Cluster 3 particularly low
3. How to take business decisions?	2,9	2,9	2,2	3,3	3,5	1,9	Cluster 3 low
4. How does financial management work?	2,7	2,7	2,1	3,3	3,1	1,9	Cluster 3 low
5. How can you start a new business?	2,8	2,7	2,0	3,1	3,3	1,6	Cluster 3 very low
6. How to search for and attract funds for a new venture?	2,8	2,8	2,1	3,1	3,4	1,8	Cluster 3 low
7. How to identify commercial opportunities?	2,9	3,0	2,2	3,4	3,6	1,9	Cluster 3 low, cluster 5 high
8. How to secure and protect intellectual property rights for your research?	3,4	3,0	2,5	3,7	3,7	2,3	Cluster 5 high
9. How to search (and utilise) data from patent information, innovation information and other sources of knowledge?	3,1	3,0	2,4	3,4	3,5	2,1	
10. Your understanding of the different ethical issues that exist in relation to your research and its utilisation?	3,7	3,7	3,1	3,7	3,8	3,2	Cluster 2 and 5 high
11. Your skills in negotiation?	3,4	3,5	2,7	3,6	3,6	2,8	Clusters 2 and 5 high
12. Your ability to identify an appropriate business model to commercialise your research?	2,8	2,9	2,1	3,4	3,5	1,8	Cluster 3 low
13. Your ability to develop a complete Business Plan?	2,7	2,6	2,1	3,3	3,4	1,7	Cluster 3 low
14. Your ability to promote the outputs of your research in front of potential clients, investors, partners?	3,4	3,5	2,7	3,9	3,8	2,4	Clusters 2 and 5 high

The following analysis is given as bullet points in order to provide a clear and concise **overview for each cluster, summarising previous findings**:

Cluster 2:

- ⇒ Institutional environment and EU project experience:
 - Predominantly individuals working in public organisations
 - Mixed institutional affiliation
 - Institutional environment is seen as not very supportive
 - People with more than two years EU project experience
- ⇒ Competences/skills:
 - Scores slightly higher than the average
 - Competences related to ethical issues, negotiation skills and promotion of research outputs are scored particularly high
- ⇒ Previous experience in commercialisation topics:
 - Strong market orientation and solid commercially awareness
 - Higher than average percentage of respondents who have previously started a company
 - Half of respondents have applied for a patent
 - More than half (55.3%) have already developed a prototype/product
 - A high number of respondents has previous training experience
- ⇒ Perceived Barriers - obstacles and risks:
 - Lack of funding – *may be interpreted as 'lack of knowledge on how to attract funds'*
 - Lack of institutional support
- ⇒ Training interest:
 - Very high training interest (scores 4.4/5)
- ⇒ Training preferences:
 - Training mode: online/face-2-face preference is for 50/50 or 25/75 (in %)
 - Willingness to travel: more flexible
 - Willingness to devote time: most willing

⇒ Training suggestion for cluster2:

Cluster 2 shows **solid commercial awareness and market orientation**, proved through a quite high number of respondents having done concrete commercial exploitation activity (prototype/product development, patent, company creation) even though mostly working in **public organisations with few institutional support**. However, this cluster shows particular high interest in training, **preferring face-2-face mode**, but being **quite flexible in terms of time devotion and travel**. It can as thus be concluded that the **training targeting this cluster should start from a certain level of expertise, meaning that “basic issues” do not necessarily be treated, but the training content should target more “advanced” topics**. The auto-evaluation of the competences has however not brought specific evidence on the topics to be covered in particular.

Cluster 3:

⇒ Institutional environment and EU project experience:

- Large concentration of academics and of respondents working in public organisations
- Poor scores with regards to the support through their institutional environment
- People with less than two years EU project experience

⇒ Competences/skills:

- Scores steadily lower
- They have evaluate themselves as having poor competence and

⇒ Previous experience in commercialisation topics:

- Moderate commercial awareness - scores a bit higher than the average
- Less than 10% have started a company (the least percentage in comparison to the other two clusters)
- They have the least respondents with previous business training (15.8%)
- Cluster 3 clearly lacks in all three aspects (product/prototype, patent, company creation) in comparison to clusters 2 and 5

⇒ Perceived Barriers - obstacles and risks:

- Lack of funding – *may be interpreted as 'lack of knowledge on how to attract funds'*
- Lack of necessary skills/ knowledge

⇒ Training interest:

- Solid interest in receiving training (scores 3.7/5)

⇒ Training preferences:

- Training mode: online/face-2-face preference is for 50/50 (in %)
- Willingness to travel: a bit less flexible
- Willingness to devote time: less willing

⇒ Training suggestion for cluster 3:

Cluster 3 evaluating itself as low on competences, it is recommended to **put particular attention on** a broad training programme in terms of **content**. A particular **skills gap** can be identified with regard to **Business creation and development, as well as financial aspects** (based on auto-evaluation which is, as already stated, not to be taken as a fix base of evaluation) and this from a very first identification of business opportunities, product launch and business plan set up.

Given the fact that cluster 3 is however not willing to spend too much efforts in terms of time and geographic distance to cover and taking into consideration its training mode preferences, this could be a segment of researchers with interest to **short-term training on a regional level, as well as e-learning programmes**.

Cluster 5:

- ⇒ Institutional environment and EU project experience:
 - Significantly higher percentage of respondents from private organisations and from SMEs
 - They operate in a very supportive institutional environment
 - People with more than two years EU project experience
- ⇒ Competences/skills:
 - Scores higher than average
 - Elite segment with strong competence
- ⇒ Previous experience in commercialisation topics:
 - High commercial awareness and market orientation
 - Significantly more respondents who have started a company
 - They are more likely to have applied for a patent, to have initiated licensing out and/or to have produced a prototype/product
 - There are also more respondents with previous business training
- ⇒ Perceived Barriers - obstacles and risks:
 - Lack of funding – *may be interpreted as 'lack of knowledge on how to attract funds'*
 - Lower scores on perceived barriers
- ⇒ Training interest:
 - Shows high interest in training (scores 4.2/5)
- ⇒ Training preferences:
 - Training mode: online/face-2-face preference is for 25/75 or with less preference 0/100 or 50/50 (in %)
 - Willingness to travel: more flexible
 - Willingness to devote time: intermediate willing

⇒ Training suggestion for cluster 5:

Cluster 5 is an **elite segment with strong competences, high commercial awareness and market orientation**, composed of a high percentage of respondents from **private organisations or SMEs**. It can thus be assumed that this cluster segment **doesn't need basic training on "how to become an entrepreneur"**, especially with regards to the fact that a **high number has already gone through previous training and doesn't perceive many barriers** that might prevent them from becoming an entrepreneur. Nevertheless, cluster 5 shows **high interest in training, in particular as face-2-face training with intermediate duration**. Respondents from cluster 5 indicate that they have high competence on topics such as identification of commercial opportunities, IPR, negotiation and promotion/sales. The **training content should** as thus, as for cluster 2, **start from a certain level of expertise; particular attention might be taken to practical cases and exchange on experiences** (assumption with regards to cluster composition).

The outcomes of the roundtable discussions regarding the training needs of the different health/life science researcher clusters were the following:

- The six clusters “are the right ones”. They actually represent the different types of health researchers existing in Europe.
- Cluster 5 and 2 are potentially the most interesting ones for Health-2-Market’s scope. Cluster 3 is interesting, too, but it is also risky, as it seems obvious that if cluster 3 researchers do not get long lasting additional support (beyond the Health-2-Market training and services) they will probably fail in commercialisation activities due to their low level of previous knowledge. Cluster 4, though having a strong potential, should not be given too much emphasis to (their very low interest for trainings is a major barrier for attracting them to Health-2-Market activities). Cluster 1 and 6 should be out of target.
- Overall, the selection of Clusters 2, 3 and 5 as more prone to Health-2-Market trainings and services seems rationale (i.e. they should comprise the major target groups that the project should focus on). On the other hand, it should not be ignored that:
 - The health researchers interested in commercialisation is a rather very small minority among health researchers.
 - The actual demand for business training services among them is even a smaller one.
 - Thus, the overall demand and interest is probably rather small, and as experience has shown, from previous training efforts in the past, a too much focused approach on attracting Health Researchers specific target groups might not be that much effective at the end, since the interest might not be that strong, and finally the participants in trainings might probably derive from all clusters. This means that Health-2-Market Training Programme should be properly designed and be ready / flexible enough to address mixed groups of Researchers (with different characteristics).
- In particular, to achieve attracting researchers from Clusters 5 and 2, we should promise and deliver to them considerable networking and contacts with Venture Capitalists as well as other representatives from the investors and/or business communities (for more details see chapter on training preferences).
- The most important is to find and attract highly motivated researchers (motivated to commercialisation and also with strong interest for business training). To do so, we need to have exposure to the proper networks (Health Networks, NCPs, etc).
- Young researchers should also be of major interest for the project, since in several cases they have the ideas, the energy and in general are more prone to training as well as to take the commercialisation risk.
- Overall, for the selection of our target groups the most important criterion should be the interest for training.

4 Conclusions

The **advanced analysis of the H2M online survey confirms our initial assumptions** that our main target audience is not homogeneous and that it can be divided into unique clusters. We conclude on six main cluster segments that are classified according to 4 variables, namely the respondents' overall competence, commercial awareness, institutional environment and interest in training. These clusters show significant variations in their attitudes and "behaviour". The clustering exercise facilitates the targeting process; three of the six segments are selected for targeting and further analysis, providing the programme designers with significant insights as to the points of difference and parity among these groups. Cluster 4 is in addition a target group for dissemination and promotion of training activities, targeting "to make them change their mindset" regarding their perception on little usefulness of trainings.

The **three selected target clusters** (namely clusters 2, 3 and 5) have in common the **high interest in training** (which measures perceived usefulness and willingness to participate in business/entrepreneurship training). The aspect of interest is the most important element to take into account for addressing target groups. Overall, the three clusters seem to follow a novice/ moderate/expert type of classification for most tested aspects, with cluster 3 being the one scoring relatively lower, cluster 5 being the expert and cluster 2 usually scoring within the middle range.

As could have been expected, **previous experience** in start-ups and previous training experience are two significant "classifiers" which seem to have a strong effect on most key aspects measured. Cluster 5 has a significantly larger concentration of respondents who have already started-up a company and of respondents that have already followed training in entrepreneurship/business. On the other side, Cluster 3 is mostly made of respondents with no previous experience.

Not far from this respect, experience in patent application, licensing out process initiation and prototype/product development follows the same pattern, with Cluster 5 respondents being the most likely to have experience in these areas. Although significant differences along the three clusters exist, it should be noted that cluster 2 has a remarkable performance whereas half of its respondents have already applied for a patent and more than half (55.3 %) have already developed a prototype/product.

The analysis of the cluster differences in **competences** shows the same three-level pattern: overall cluster 3 scores low, cluster 5 high and cluster 2 in-between. Even though the differences along the 14 competences among the clusters are significant, the scores in some competences for clusters 2 and 5 converge, suggesting the possibility of common training approach in these areas. Most of these convergences appear in the less mainstream competences (competences that do not belong in the main factor of competences) further suggesting that these areas are rather discrete.

Based on the division into segments through our **online survey** analysis, it is **possible to identify specific conclusions for the abovementioned clusters we have analysed in details:**

- ⇒ **Their previous experience, competences and skills**
- ⇒ **Their perception of barriers in terms of obstacles and risks in becoming an entrepreneur**
- ⇒ **Their skills gap**
- ⇒ **Their training needs in order to fill the skills gap**

The **bibliographic analysis** has been a basis for comparison with other studies and partly transferability from other fields. Main outcomes have shown that previous studies already proofed training interest rather in practical training concepts that were based on a concrete needs analysis of the target group. This confirms the Health-2-Market project approach which aims to base any further specification of training offer on the identified needs outlined in this analysis.

The **interviews** were very useful in order to specify certain outcomes and get a more personal view from researchers, entrepreneurs and TTOs. In particular, the interview analysis has brought more detailed information with regards to the skills gap and training needs in terms of concept and topics to be treated. This information shall be taken into account for the design of the training offer, in particular as it proves the quantitative outcomes from the online survey.

The **roundtable discussions** have proven that most elements already covered in the draft Training Needs Analysis Report were “real” and that the findings should be taken as an important basis for the development of the training programme. In addition to providing validation to most of the key findings, the discussions brought up also a number of critical notes and additional areas (e.g. training topics) that should not be ignored. In addition, the roundtables were able to provide us with some novel insights, on top of those already identified, which are going to be an asset for our training programme design exercise. Finally, they provided us with considerable advices and suggestions on the context and implementation patterns and characteristics that Health-2-Market training programme should adopt so as to reassure an increased interest for participation by European Health Researchers.

The in-depth Training Needs Analysis has brought the conclusions that **the 3 above mentioned cluster segments (clusters 2, 3 and 5) can be the basis for segmentation of the broad group of health/life science researchers even beyond the respondents of the online survey.** As thus, their identified competences, perception of entrepreneurship including the obstacles and risks associated, as well as the skills gap were a valuable basis for analysis that could be specified through the interviews with the target groups of researchers, entrepreneurs and TTOs.

We presume that the training offer should respond to the demand expressed, but also try to cut down obstacles (wherever possible) by improving the researchers’ knowledge and skills, as well as improving their self-confidence with regards to business matters. It should thus reduce their perception of insurmountable barriers and risks.

The **identified training needs** have been the **ground for recommendations of training concepts**, detailed in chapter 3.2.3. This should be an important basis for the designing of the Health-2-Market training offer.

The analysis concluded that the **most important aspects** mentioned were related to the following items, with an emphasis on the fact that all should in particular be tuned to the health field:

- ⇒ Financial and market analysis aspects
- ⇒ Business Plan construction
- ⇒ Intellectual Property Rights (for less experienced target groups)
- ⇒ Mentoring
- ⇒ Networking and contacts to experts (venture capitalists, IPR experts, etc.)
- ⇒ Practical training

Overall, an important training element should be **“to change the mindset”** of the researchers, in order to make them perceptive for commercial exploitation activities and to give them an “outcome orientation” with regards to financial aspects.

The training offer should **take into consideration the different levels of expertise** identified for the cluster segments, targeting to provide training that may bring them further from their actual stage of knowledge on the way of enhanced entrepreneurship. Specific recommendations are given in chapter 3.2.3.3.

The specifications for particular segments and target groups for the Health-2-Market training offer will concern the training framework (modus, duration, geographical offer, etc.), as well as the concept and content in terms of topics. Overall, researchers seem not to put many conditions with regards to the framework of a training programme – in the contrary to the content (analysed above). With regards to the Health-2-Market training offer, it is probable that a customisation of training content would be more effective for the seminars (one day seminars on a regional level) as for the week-long academies that are less numerous and planned on a European level. However, the customisation is indeed only useful if a sufficient number of participants coming all from a homogeneous cluster group can be attracted. Otherwise, mixed groups are not considered to be an issue, as long as the training could treat aspects that are of interest to all of them (e.g. regional aspects rather than competence/experience related aspects).

Almost every interviewee indicated to be willing to travel at an international level at **one condition: the training output (return on investment) has to be clear from the beginning and it must be based on a practical concept.**

5 Next steps

The Health-2-Market project is designed to provide high-level training offers and support services to health/life sciences researchers in order to enhance their entrepreneurship attitude.

The Training Needs Analysis will be the ground for the design and specification of the concrete training offer, focusing on the different target groups and their needs.

The analysis is put on the solid basis of 4 sources of analysis – bibliographic data, quantitative data, qualitative data and expert validation. The combination of these sources in a widespread and comprehensive approach has proven efficiency and is a valuable base for the training concept design.

Based on this final version of the Training Needs Analysis, the Health-2-Market project team will proceed with the following actions:

- ⇒ **Training concept design**
- ⇒ **Programme development**
- ⇒ **Programme validation**
- ⇒ **Pilot trainings**

These steps' objective is to translate the TNA into training terms and to develop and validate the training concept and programme. Once the training concept and programme are developed, pilot trainings will be organised in order to seek for feedback from participants and to permit on-site observations. If necessary, these will conclude on a final adaptation of the concept and programme.

The overall aim is to develop a sustainable training offer that can support researchers even beyond the Health-2-Market project duration.

The timeline for the **next steps of the Health-2-Market project (till September 2013)** is the following:

1. Finalisation of the Health-2-Market training concept and programme (March/April 2013).
2. Preparations for the Pilot Academy in Sophia Antipolis, France (April – September 2013).
3. Creation of a group of external coaches to be utilized as tutors for the Health-2-Market Academies and Seminars (Spring 2013).
4. Promotion of the 1st Academy – opening of registration (Spring 2013).
5. Implementation of the 1st Academy at SKEMA Business School, Sophia Antipolis, France (September 2013).

6 Appendices

6.1 Bibliographic references

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6.2 List of interviewees

n°	Type	Name	Organisation	Country
9	Researcher	Bamidis Panagiotis	AUTH medical school, Medical Informatics Lab	Greece
	Researcher	Dimitrios Kouretas	University of Thessaly Biochemistry & Biotechnology Dpt	Greece
	Researcher	Marco Terreni	University of Pavia	Italy
	Researcher	Vassiliki Tsirkoni	Katholieke Universiteit Leuven	Belgium
	Researcher	Heike Benecke	cmpb, Research Center Molecular Physiology of the Brain	Germany
	Researcher	Linda Pötter	Medical Faculty, Bochum, Proteomik / Medizinische Proteom-Center	Germany
	Researcher	Diane Whitehouse	The Castlegate Consultancy	United Kingdom
	Researcher	Andras Székely	Semmelweis University	Hungary
	Researcher	Valerie Delague	INSERM	France
6	Entrepreneur	Davide De Lucrezia	Explora Biotech Srl	Italy
	Entrepreneur	Shivang R. Dave	MIT	Spain
	Entrepreneur	German Gonzalez Serrano	<i>still to be created</i>	Spain
	Entrepreneur	Koen De Witte	reMYND	Belgium
	Entrepreneur	Pierre Escoubas	VENOMETECH	France
	Entrepreneur	Markela Psymarnou	VIDAVO	Greece
11	TTO	Ana Sagardoy	Pompeu Fabra	Spain
	TTO	Sophie Deschaintres	CNRS	France
	TTO (Cluster)	Alexandra Chukas	EUROBIOMED	France
	TTO	Patrick Faure	SATT SUD-EST	France

	TTO (Cluster)	Cinzia Giordano	Tuscany Life Science	Italy
	TTO	Olivier Freneaux	SATT SUD-EST	France
	TTO	Erik Tambuyzer	Center for Medical Innovation (CMI)	Belgium
	TTO (Cluster)	Gunilla Bökmark	Sahlgrenska Science Park	Sweden
	TTO	Frank Stief	Charité	Germany
	TTO	Klára Bartha	University of Debrecen Knowledge & Technology Transfer Office	Hungary
	TTO	Kerényi Áron	Semmelweis Innovation Centre Ltd.	Hungary

6.3 Interview guidelines

INTERVIEWS FOR RESEARCHERS – Guidelines and reporting form –

THIS IS FOR TELEPHONE OR FACE TO FACE INTERVIEW PURPOSES AND IS NOT DESIGNED FOR SELF COMPLETION GIVEN THE NUMBER OF OPEN ENDED QUESTIONS.

Purpose of the interviews: to identify interest of researchers to become an entrepreneur, possible obstacles and their eventual training needs; data from the interviews may be used to identify possibilities to involve the person in project activities, but all data is handled confidentially.

Target group: researchers in the Health / life sciences field

Expected Outcome:

- a) clear view on needs and obstacles
- b) understanding of how we can eventually involve this person in the project activities

Indicative elements:

- Please use this form as a guideline for telephone or face-2-face interviews, but don't dispatch the form directly to the interviewees.
- The guidelines are given in the form of questions in order to facilitate interviews and treatment of responses. Please see questions as an indication and support – this is the same for *possible* answers indicated.
- For reporting purposes:
 - Please use one form per interview and give answers after each question – pay *particular attention to sections 4 and 5, please*
 - Where relevant, please give some sentences of explanation (open questions), otherwise and where applies you may tick answer indications if they were confirmed by your interviewee
- **Deadline: 03 December 2012**
- Please return forms to Eva Fadil (inno): e.fadil@inno-group.com

Short outline of the Health-2-Market project:

Health-2-Market: *FROM HEALTH RESEARCH TO MARKET – ADVANCED SERVICES AND TRAINING ACTIONS FOR THE IPR MANAGEMENT AND BUSINESS EXPLOITATION OF THE EU-FUNDED RESEARCH RESULTS IN HEALTH/LIFE SCIENCES*

Health-2-Market is a 3-year Coordination Action aiming to boost the economic exploitation of research results in the area of Health / Life Sciences.

The Health-2-Market project aims at providing advanced services and training actions on Intellectual Property Rights/Asset/Innovation management and knowledge transfer mainly to Health/life science researchers who are involved in research projects in Health.

1) ABOUT YOURSELF

Purpose: gather some personal information

- 1.1 Name, Title
- 1.2 Main Research fields
- 1.3 Years of experience
- 1.4 Age
- 1.5 Sex

2) ABOUT YOUR RESEARCH ORGANISATION

Purpose: clarify the current research environment and experience of the interviewee

2.1 Name of the organisation

2.2 Type of organisation

2.2.1

- Private Public
- Other (please specify)

2.2.2

- University Research Institute
- Other (please specify)

2.2.3 Country

2.3 What is your position in the organisation (head of section, etc.)?

2.4 What are the main foci and the areas/technologies covered by your organisation?

2.5 How many employees are there in your organisation?

2.6 Does your organisation have :

2.6.1 an Intellectual Property Policy?

- yes no

2.6.2 a commercialisation policy ??

- yes no

3) **YOUR EXPERIENCE IN ENTREPRENEURSHIP**

Purpose: gather information on possible entrepreneurship experience with open questions for personal point of views/answers

3.1 What does the expression “to be an entrepreneur” mean to you?

3.2 Have you ever thought of becoming an entrepreneur?

If yes, why?

If no, why?

3.3 Do you think your involvement in the commercialisation of your research results would prevent you from contributing to the progress of science or support its progress? Why? (if answer is “prevent”, go to section 4)

3.4 Do you have a concrete idea for a business?

yes

no

If “yes”, could you give a short outline?

3.5 What would encourage you to develop entrepreneurship activities in your current post? Are there any framework conditions that could be changed?

3.6 Would you like to establish a company? What is the timing for such a decision? (short term, middle, long)

yes

no

If “yes” give a short outline.

3.7 If yes, how do you justify your view that your research should be valorised/commercialised?

3.8 How commercially exploitable do you consider your research?

3.9 Are there any contacts/networks that you can use in order to support the valorisation of your research/technology? If yes, which?

3.10 Have you already undertaken some steps to become an entrepreneur?

[Possible answers might be:

- *Commercial registration*
- *Creation of a business plan*
- *Created a company*
- *Market research (target, clients, product/services, prices, competitors, size)*
- *Others (please specify)]*

4) PERCEPTION OF OBSTACLES AND RISKS

***Purpose:** to discuss and clarify what is viewed as the typical obstacles or risks regarding the creation of a business based on research activities.*

4.1 In your opinion, what are the risks to become an entrepreneur?

[Indication of possible answers – please don't list them, but ask for a personal answer from interviewee:

- *Financial risks*
- *Lack of market knowledge (market size, competitors...)*
- *Legal risks*
- *How to choose the right and most reliable investors to boost financial backing*
- *Concern on cash flow*
- *Costs of protection (IP, patent...)*
- *How to choose a consultant and expert in the field*
- *How to choose the right lawyer*
- *Other (please specify)]*

4.2 Would you be ready to invest your own money?

- No
- Yes (if yes how much?)

4.3 Which are the difficulties you think you could encounter when commercialising your research results?

[Indication of possible answers – please don't list them, but ask for a personal answer from interviewee:

- *No idea on how to commercialise a project*
- *Legal difficulties*
- *Lack of funds*

- *Lack of support: no favourable environment for business*
- *Lack of employees who can help starting the business*
- *Difficulty to connect research to concrete commercialization opportunities (have a concrete outcome for the market)*
- *Lack of information/competences on “how to do business”:*
 - *How to write a business plan*
 - *How to do a competitor analysis*
 - *How to conduct market studies*
 - *Difficulties in predicting the market moves*
 - *How to attract investors in order to get funds/capital*
 - *How to identify the segment of the market to be targeted (clients, product placement, geographical market, etc.)*
- *Lack of network/lack of knowledge on “how to network”*
- *Lack of administrative knowledge (statutes, registration etc)*
- *Lack of financial knowledge (income statements, balance sheets, etc.)*
- *Other (please specify)]*

5 **TRAINING NEEDS**

Purpose: *To understand the end-users attitude towards training programmes that could help researchers to become entrepreneurs*

5.1 If there was a training programme to support you to become an entrepreneur, would you participate?

- Yes No

5.2 What type of activities should a training program contain?

[Indication of possible answers – please don’t list them, but ask for a personal answer from interviewee:

- *Business Plan preparation*
- *Help regarding the financial aspects of becoming an entrepreneur*
- *Market analysis*
- *IPR discussion/role play*
- *Thematic workshops (please specify)*
- *Mentoring (the presence of a mentor who is or was a senior entrepreneur)*
- *Networking (with other to-be entrepreneurs)*
- *Other (please specify)]*

5.3 What would be the budget you would agree to spend for such a training?

- <500€
- <1000€
- <2000€
- >3000€

5.4 How much time would you devote to such a program?

- 1 day seminar
- 2 day seminar
- 1 week academy

5.5 How far would you travel to attend such a training program?

- Regional level
- Country level
- International level

5.6 What are the barriers that could prevent you from participating in a training program?

Prompt if necessary, for example....

- *The price*
- *The lack of time*
- *Feeling that the training program does not have a direct return in terms of output*
- *Other (please specify)*

THANK YOU

INTERVIEWS FOR ENTREPRENEURS – Guidelines and reporting form –

THIS IS FOR TELEPHONE OR FACE TO FACE INTERVIEW PURPOSES AND IS NOT DESIGNED FOR SELF COMPLETION GIVEN THE NUMBER OF OPEN ENDED QUESTIONS.

Purpose of the interviews: to identify the perception of entrepreneurs in the health/life science field of possible obstacles in entrepreneurship and their evaluation of training needs; data from the interviews may be used to identify possibilities to involve the person in project activities, but all data is handled confidentially.

Target group: entrepreneurs of the Health / life science field

Expected Outcome:

- a) clear view on needs and obstacles
- b) understanding of how we can eventually involve this person in the project activities (e.g. interested to participate in training to share his/her successful experience? Share lessons learnt? To attend as a trainer?)

Indicative elements:

- Please use this form as a guideline for telephone or face-2-face interviews, but don't dispatch the form directly to the interviewees.
- The guidelines are given in the form of questions in order to facilitate interviews and treatment of responses. Please see questions as an indication and support – this is the same for *possible* answers indicated.
- For reporting purposes:
 - Please use one form per interview and give answers after each question – pay *particular attention to sections 4 and 5, please*
 - Where relevant, please give some sentences of explanation (open questions), otherwise and where applies you may tick answer indications if they were confirmed by your interviewee
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1) **ABOUT YOURSELF**

Purpose: gather some personal information

1.1 Name, Title

1.2 Main Research fields

1.3 Years of experience

1.4 Age

1.5 Sex

2) **ABOUT YOUR COMPANY**

Purpose: to clarify current environment and experience of the interviewee

2.1 Name of the company

2.2 Type of company

2.2.1

Private Public

Other (please specify)

2.2.2

Industry SME Biomedical Institute

Other (please specify)

2.2.3 Country

2.3 What is your position in the company (head of section, etc.)?

2.4 What is the mission of your company and its strategic objectives?

2.5 What are the main focus and the areas/technologies covered by your company?

2.6 How many employees are there in your company?

2.7 Does your company have:

2.7.1 an intellectual Property Policy?

yes no

2.7.2 a commercialisation policy ?

yes no

3) **YOUR VIEW ON ENTREPRENEURSHIP**

Purpose: gather information on entrepreneurship experience with open questions for personal point of views/answers

3.1 Do you think that there are many entrepreneurial opportunities in the health market?

3.2 What factors do you think have a positive influence on the growth of entrepreneurial opportunities?

3.3 Do you have a specific market addressed, and if so, which (size)?

3.4 Are there any contacts/networks that you use for the valorisation of your technology?

3.5 What do you think about working in collaboration with

- scientists and researchers?
- financial managers and venture capitalists?

3.6 Do you manage your business on your own or do you prefer an organisation that manages start-ups on a professional basis?

4) **PERCEPTION OF OBSTACLES AND RISKS**

Purpose: to discuss and clarify what is viewed as the typical obstacles or risks regarding the creation of a business based on research activities

4.1 Which are the difficulties encountered in the commercialisation of your product/technology?

[Indication of possible answers – please don't list them, but ask for a personal answer from interviewee:

- *Legal difficulties*
- *Lack of funds*
- *Lack of employees in the beginning*

- *How to improve the quality of the firm*
- *How to increase the chances of survival of new and existing firms*
- *How to encourage the growth and the development of the company*
- *Other (please specify)]*

5.4 How much time do you think such a programme should take?

- 1 day seminar
- 2 day seminar
- 1 week academy

5.5 What are the barriers that could prevent researchers from participating in a training programme? *Prompt if necessary, for example....*

- *The inability to pay*
- *The lack of time*
- *The feeling that the training programme does not have a direct return in terms of output*
- *Other (please specify)*

THANK YOU

INTERVIEWS FOR TTOs

– Guidelines and reporting form –

THIS IS FOR TELEPHONE OR FACE TO FACE INTERVIEW PURPOSES AND IS NOT DESIGNED FOR SELF COMPLETION GIVEN THE NUMBER OF OPEN ENDED QUESTIONS.

Purpose of the interviews: to identify the perception of TTOs of possible obstacles in entrepreneurship and their evaluation of training needs; data from the interviews may be used to identify possibilities to involve the person in project activities, but all data is handled confidentially.

Target group: TTOs

Expected Outcome:

- a) clear view on needs and obstacles
- b) understanding of how we can eventually involve this person in the project activities (e.g. interested to participate in training to share his/her successful experience? Share lessons learnt? To attend as a trainer? To participate in the focus group in order to present experience /interested to co-organise a workshop, ...)

Indicative elements:

- Please use this form as a guideline for telephone or face-2-face interviews, but don't dispatch the form directly to the interviewees.
- The guidelines are given in the form of questions in order to facilitate interviews and treatment of responses. Please see questions as an indication and support – this is the same for *possible* answers indicated.
- For reporting purposes:
 - Please use one form per interview and give answers after each question – pay *particular attention to sections 4 and 5, please*
 - Where relevant, please give some sentences of explanation (open questions), otherwise and where applies you may tick answer indications if they were confirmed by your interviewee
- **Deadline: 03 December 2012**
- Please return forms to Eva Fadil (inno): e.fadil@inno-group.com

Short outline of the Health-2-Market project:

Health-2-Market: *FROM HEALTH RESEARCH TO MARKET – ADVANCED SERVICES AND TRAINING ACTIONS FOR THE IPR MANAGEMENT AND BUSINESS EXPLOITATION OF THE EU-FUNDED RESEARCH RESULTS IN HEALTH/LIFE SCIENCES*

Health-2-Market is a 3-year Coordination Action aiming to boost the economic exploitation of research results in the area of Health / Life Sciences.

The Health-2-Market project aims at providing advanced services and training actions on Intellectual Property Rights/Asset/Innovation management and knowledge transfer mainly to Health/life science researchers who are involved in research projects in Health.

1) ABOUT YOURSELF

Purpose: gather some personal information

1.1 Name, Title

1.2 Main Research fields

1.3 Years of experience

1.4 Age

1.5 Sex

2 ABOUT YOUR ORGANISATION

Purpose: to clarify current environment and experience of the interviewee

2.1 Name of the organisation

2.2 Type of organisation

2.2.1

Private Public

Other (please specify)

2.2.2

Cluster SME association University

Research Institution Other (please specify)

2.2.3 Country

2.3 What is your position in the organisation (head of section, etc.)?

2.4 What is the mission of your organisation and its strategic objectives?

2.5 What are the main foci and the areas/technologies covered by your organisation?

2.6 How many employees are there in your organisation?

2.7 Does your organisation have:

2.7.1 an intellectual Property Policy?

yes no

2.7.2 a commercialisation policy ?

yes no

3 **YOUR VIEW ON ENTREPRENEURSHIP**

Purpose: to get an insight on a TTOs point of view on entrepreneurship issues through open questions

3.1 Do you think that there are many entrepreneurial opportunities in the health market?

Give examples...

3.2 What factors do you think have a positive influence on the growth of entrepreneurial opportunities?

3.3 What kind of networks would you recommend for the valorisation of research results?

4 **PERCEPTION OF OBSTACLES AND RISKS**

Purpose: to discuss and clarify what is viewed as the typical obstacles or risks regarding the creation of a business based on research activities

4.1 Which are the difficulties you think researchers can encounter in the commercialisation of their product/technology?

[Indication of possible answers – please don't list them, but ask for a personal answer from interviewee:

- *Legal difficulties*
- *Lack of funds*
- *Lack of employees in the beginning*
- *Difficulties in predicting the market moves*
- *How to attract investors in order to get funds/capital*
- *How to identify the segment of the market to be targeted*
- *Lack of network / lack of knowledge on "how to network"*
- *Lack of administrative knowledge (income statements, balance sheets, etc.)*
- *Other (please specify)]*

4.2 In your opinion, what are the risks of being an entrepreneur?

[Indication of possible answers – please don't list them, but ask for a personal answer from interviewee:

- *Legal risks*
- *Financial risks*

- *Market instability*
- *How to identify and evaluate different markets and select the ones that are more suitable for your company*
- *How to chose the right and most reliable investors to boost financial backing*
- *Concern on cash flow*
- *Costs of protection (IP, patent...)*
- *How to chose a consultant and expert in the field*
- *How to chose the right lawyer*
- *Other (please specify)]*

5 **TRAINING NEEDS**

Purpose: *To understand TTOs' attitude towards training programmes that could help researchers improve their business skills. Please explore issues such as: "Is training needed?", "What is the essential/must have content" ...*

5.1 Do you think it is useful/ important for researchers who want to become entrepreneurs to follow a specific training?

Yes No

Please give a short explanation

5.2 What type of activities should a training programme contain?

[Indication of possible answers – please don't list them, but ask for a personal answer from interviewee:

- *Help related to the financial aspects*
- *Market analysis*
- *Thematic workshops – specify*
- *Networking (with other entrepreneurs and scientists and researchers)*
- *Help in the construction of a business plan*
- *How to improve the quality of the firm*
- *How to increase the chances of survival of new and existing firms*
- *How to encourage the growth and the development of the company*
- *Other (please specify)]*

5.3 How much time do you think such a programme should take?

- 1 day seminar
- 2 day seminar
- 1 week academy

5.4 Do you think your institution would be interested in participating in/ hosting such a programme?

Yes No

5.5 Who at your organisation might be interested in such a programme?

5.6 What are the barriers that could prevent researchers from participating in a training programme? *Prompt if necessary, for example....*

- *The inability to pay*
- *The lack of time*
- *The feeling that the training programme does not have a direct return in terms of output*
- *Other (please specify)*

THANK YOU

6.4 Online survey questionnaire

Dear participant in EU collaborative research,

Health2Market is an initiative supported by the EC with the ambition to support health/life science researchers and related actors in the process of transforming research results into successful new business initiatives.

We are launching this survey with the aim to gain a better understanding of your needs, so that we can offer you an efficient and free of charge training programme to help you exploit and pursue the outcomes of your research.

Your opinion and experience is very valuable and we have designed our survey so that it can be completed **within 10 minutes**. All answers will be treated with full confidentiality.

We would like to thank you in advance for your time.

Svetlana Klessova, inno

Health2Market project coordinator

www.health2market.eu

Part 1 out of 3 – Economic Value from Research Results

In this section we would like your opinion and feedback on some aspects relating to the creation of value from research results. To respond, simply chose the number that corresponds most closely to your opinion.

1) To what extent do you think that health research results should be aimed at:

Producing scientific publications (A: 1-to a low extent – 5 –to a high extent)

Commercialising health related products, devices, services (A: 1-to a low extent – 5 –to a high extent)

Providing solutions to health issues (A: 1-to a low extent – 5 –to a high extent)

2a) How commercially exploitable do you consider your principal research activities to be? (A: 1 Low -5 High)

2b) Do you pay attention to connect your research activities with market needs? (A: 1 not at all - 5 very)

2c) How willing would you be to exploit commercially parts of your research? (A: 1 not at all - 5 very)

3a) Have you started up your own firm? (A: Y/N)

3b) **If No**, how likely is it that you will start a new firm on your own or with colleagues/friends?

3c) **If No**, please tell us whether you agree or disagree with the statements below. (For each separate item A: 1 Disagree -5 Agree)

- I am confident that I would succeed if I started my own firm
- It would be easy for me to start my own firm
- To start my own firm would probably be the best way for me to take advantage of my research
- I have the skills and capabilities required to succeed as an entrepreneur

(for both Yes and No)

- I know many people in my organisation who have successfully started up their own firm
- In my organisation, people are actively encouraged to pursue their own ideas
- In my organisation, you get to meet lots of people with good ideas for a new firm
- In my organisation there is a well functioning support infrastructure in place to support the start-up of new firms

4) Which of the following factors do you think might be an obstacle or a barrier for you in commercialising your research activities?

- Lack of interest (A: 1 Disagree – 5: Agree)
- Lack of institutional support (A: Disagree – 5: Agree)
- Lack of the necessary knowledge / skills (A: 1 Disagree – 5: Agree)
- Lack of funding (A: 1 Disagree – 5: Agree)
- Significant risks (A: 1 Disagree – 5: Agree)
- Other reasons? (A: Open Ended/string)

Part 2 out of 3 – Skills in Creating Value from Research Results

This section is about how you judge your knowledge and competences regarding some broad topics/areas that are considered to be relevant to the creation of value from health related research activities.

5) How would you rate your competence on each of the following topics: (A: 1- Low, 5- High)

- Knowledge on how the (health) market operates?
- How to launch new products or services in the market?
- How to take business decisions?
- How does financial management work?
- How can you start a new business?
- How to search for and attract funds for a new venture?
- How to identify commercial opportunities?
- How to secure and protect intellectual property rights for your research?
- How to search (and utilise) data from patent information, innovation information and other sources of knowledge?
- Your understanding of the different ethical issues that exist in relation to your research and its utilisation?
- Your skills in negotiation?
- Your ability to identify an appropriate business model to commercialise your research?
- Your ability to develop a complete Business Plan?
- Your ability to promote the outputs of your research in front of potential clients, investors, partners?

Part 3 out of 3 – Opinions about Entrepreneurship Training Programmes

This final section is about your opinion towards training programmes on the commercialisation of research, entrepreneurship and intellectual property management.

6a) Have you ever followed any entrepreneurship/business management-related training (courses/workshops)? (A: Y/N)

6b) **If “Yes”** What type of training did you follow (A: 1 online, 2 offline (face to face), 3 mix of both)

6c) **If “Yes”** How many days did the programme last (A: 1 one day, 2 two days, 3 three days 4 four days, 5 five days, 6 days or more)

6d) **If “Yes”** Who provided the training programme? (A: 1 Your own organization, 2 Private company 3 Colleagues 4 Other)

6e) **If “Yes”** Could you please describe the training programme shortly (A: Open ended, Not Required to proceed)

7) How useful do you think a training programme for entrepreneurship/business management can be for you (even if you have already participated in similar training in the past)? (A: 1 Not Useful -5 Very Useful)

8) Would you be interested in participating in a training programme that is focusing on entrepreneurship/business management (even if you have already participated in similar training in the past)? (A: 1 Unlikely -5 Likely)

9) In your opinion such training programmes may be useful in:

- Providing me with useful business knowledge (A: 1 Disagree – 5 Agree)
- Providing me with hands-on training (A: 1 Disagree – 5 Agree)
- Providing me with networking opportunities (A: 1 Disagree – 5 Agree)

10) How much time would you be willing to devote to such a training programme?

- One day seminar (A: 1 Not likely 5 Very likely)
- 2 day seminar (A: 1 Not likely 5 Very likely)
- 5 day workshop (A: 1 Not likely 5 Very likely)

11) What mix of offline and online training activities would you prefer in a programme? (A: 1 100% Online, 2 75% Online 25% Face to Face, 3 50% Online 50% Face to Face, 4 25% Online 75% Face to Face, 5 100% Face to Face)

12) How far would you be willing to travel to follow such a training programme? (Discrete A: only close to my work/home, regional level – country level – international level)

Personal Information:

13a) Gender (A: M/F)

13b) Age (A: 0-100)

14) Place of work (A: list of countries)

15a) Is your organisation private, public or a public-private partnership organisation¹⁴? (A: 1 Private, 2 Public, 3, Public private partnership)

15b) Are you are working primarily as a: (A: Researcher, Clinician, Technician, Administrative, Other)

15c) What is your main affiliation?:

(A: 1 Academic institution, 2 Research centre 3 Small or Medium-sized Enterprise, 4 Large Pharmaceutical Company, 5 Other Large private organisation, 6 Regulatory Agency, 7 International organisation, 8 Patient Organisation, 9 Freelance, 10 Other)

16) How many years of research experience do you have? (A: 0-5 Years, 5-10 Years, 10-20 Years, 20+ Years)

17a) How do you rate your experience with regard to European funded research projects?

(A: 1 I am a beginner with less than 2 years experience - 2 I have participated in some projects and I have 2-5 years of experience - 3 I am an experienced actor in EU funded research projects with more then 5 years of experience)

17b) In your current or previous experience:

- Have you applied for a patent(s)? (A: Y/N)

- Have you initiated a licensing out process? (A: Y/N)

- Have you developed a Prototype / Product? (A: Y/N)

Thank you for completing the survey! All survey responses will be treated anonymously and the strictest confidentiality will be ensured.

Interested in our activities?

Interested in accessing free of charge training?

Please provide us your contact details and we will keep you updated about the survey results and about the training opportunities offered by the Health-2-Market project. These contact details are only for contact purposes and will not be communicated outside the project.

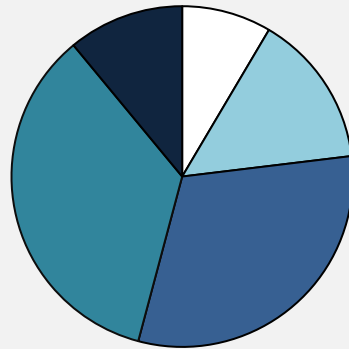
- Email (A: string)
- Name (A: string)
- Organisation (A: string)

¹⁴ **Public-private partnership (PPP)** describes a government service or private business venture which is funded and operated through a partnership of government and one or more private sector companies.

6.5 Online survey outcomes – charts

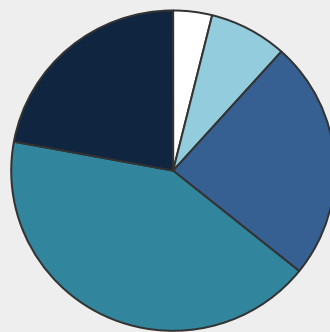
Extract of online survey outcomes in the form of charts:

2b. Do you pay attention to connect your research activities with market needs?



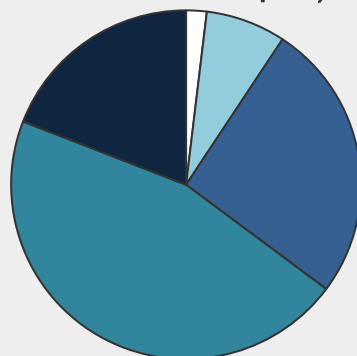
- 1-Not at all
- 2-Slightly
- 3-Moderately
- 4-Very
- 5-Extremely

2c. How willing would you be to exploit commercially parts of your research?



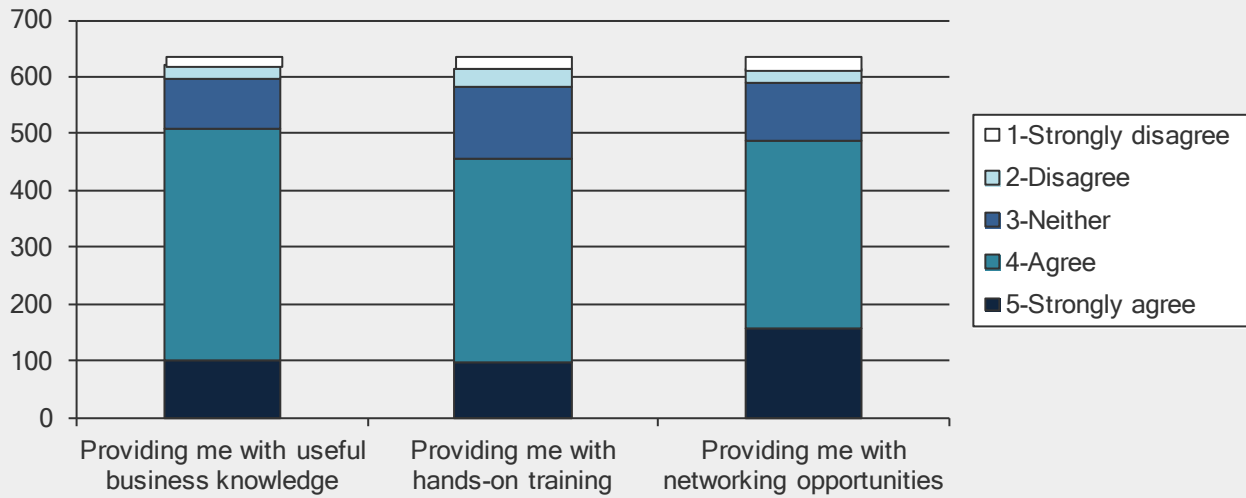
- 1-Not at all
- 2-Slightly
- 3-Moderately
- 4-Very
- 5-Extremely

7. How useful do you think a training programme for entrepreneurship/business management can be for you (even if you have already participated in similar training in the past)?

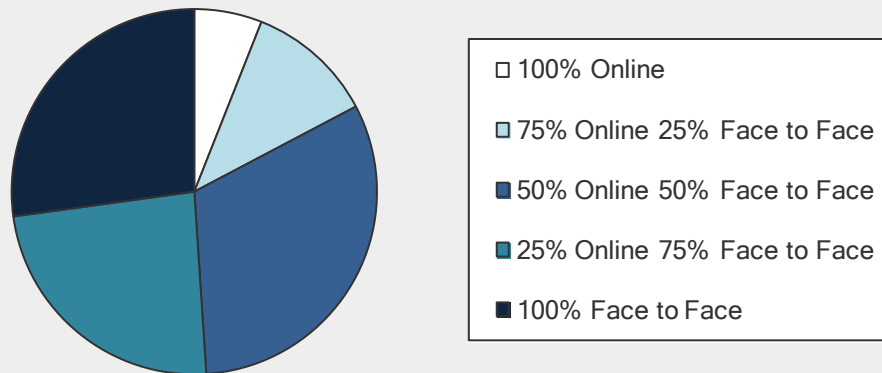


- 1-Not at all
- 2-Slightly
- 3-Moderately
- 4-Very
- 5-Extremely

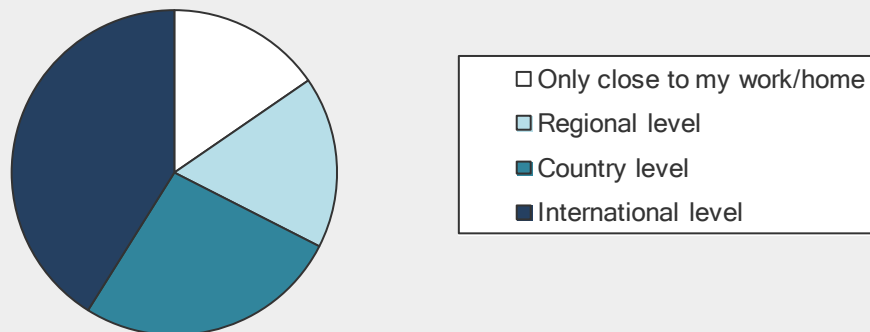
9. In your opinion such training programmes may be useful in:



11. What mix of offline (face to face) and online training activities would you prefer in a programme?



12. How far would you be willing to travel to follow such a training programme?



6.2. Annex 2: Questionnaire for policy development:

1/ Based on your interactions with the health/life sciences researchers, supporting organisations and startups during the course of the H2M project, please **describe their challenges and their drivers for entrepreneurship and exploitation of research results:**

a/ challenges:

- for the researchers :
- for the support organisations:
- for the startups:

b/ drivers:

- for the researchers :
- for the support organisations:
- for the startups:

2/ Based on your interactions with the health/life sciences researchers, supporting organisations and startups during the course of the H2M project, **what are the major lessons learnt about supporting this group of stakeholders on the topics of :**

a/ IPR:

b/ Entrepreneurship and business planning:

c/ Marketing:

d/ other:

3/ Based on your interactions with the health/life sciences researchers, supporting organisations and startups during the course of the H2M project, what would be your **recommendation to improve health sciences entrepreneurship and to support the exploitation of research results** for:

a/ university management:

b/ technology transfer offices:

c/ regional policy makers:

d/ national policy makers:

e/ European policy makers: