



UNIVERSITY OF MEDICINE AND PHARMACY
" CAROL DAVILA" from BUCHAREST
Technology Transfer Center



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Strategy of the Technology Transfer Center

CTT UMFCB

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November 2025



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ORGANIZATION OF CTT UMFC D

The Technology Transfer Center of the Carol Davila University of Medicine and Pharmacy of Bucharest (acronym CTT-UMFC D) is an entity without legal personality, established by the Decision of the UMFC D Senate.

The Technology Transfer Center within the 'Carol Davila' University of Medicine and Pharmacy of Bucharest **CTT-UMFC D** is organized and operates in accordance with the provisions of the Higher Education Law no. 199/2023, the Charter of the 'Carol Davila' University of Medicine and Pharmacy of Bucharest, decision no. 11 of 26.10.2022 (art. 6,7 - Annexes no. 20,21) of the Senate of the 'Carol Davila' University of Medicine and Pharmacy in Bucharest and of Decision 346/2023 for the approval of the Methodological Norms regarding the establishment, operation, evaluation and accreditation of entities in the innovation and technology transfer infrastructure, as well as the method of supporting them, of 12.04.2023, Official Gazette Part I no. 341 of April 24, 2023, as a distinct structure, without legal personality, at the Directorate level, hierarchically subordinated to the Legal Representative of UMFC D.

CTT-UMFC D is an entity belonging to the innovation and technology transfer infrastructure in Romania (hereinafter referred to as the ReNITT infrastructure, managed by the Ministry of Research, Innovation and Digitalization), without legal personality, being legally represented by the 'Carol Davila' University of Medicine and Pharmacy of Bucharest (UMFC D of Bucharest).

CTT-UMFC D is led by a director and has a minimum number of 4 positions provided for in its own organizational structure (1 director position, 1 marketing-licensing responsible position, 1 research and development innovation partnership development expert position, 1 intellectual property responsible position, 1 Technology Transfer/technology broker expert position), approved at the applicant level, intended to ensure the functioning and achievement of the objectives, according to the legislation governing the ReNITT infrastructure and the organizational chart approved by the UMFC D Senate in Bucharest.

CTT-UMFC D collaborates on specific issues with all Faculties within UMFC D with the Doctoral School, the Research and Development Innovation Directorate, the Research and Development Center for Innovative Therapeutic Structures InnoTher, the Interdisciplinary Center for Research and Development in Dentistry (CICDS), the Innovation and e-Health Center, the Innovation and e-Health Service, the Medical Simulation Department, the 3D Printing Laboratory , the FIES Education and Health Foundation, other research centers at the UMFC D level or in partnership with third-party organizations.

CTT-UMFC D collaborates on general issues with all UMFC D structures and departments in accordance with the specific procedures at their level or at the CTT UMFC D level.

The activities carried out within the CTT UMFC D are: research - in all forms; experimental development; innovation; technology transfer for the purpose of introducing the results of research and development activity into the economic circuit; technology audit; assistance and consultancy



for the protection and exploitation of intellectual property rights; assistance and consultancy for innovation and technology transfer; assistance and consultancy for the implementation of the innovation management system; assistance and consultancy for accessing and obtaining tax facilities in the field of research, development and innovation; assistance and consultancy for the evaluation of the results of research, development and innovation activities for the purpose of recording in accounting and establishing the value for starting negotiations; assistance for digitalization.

CTT UMFCO operates in accordance with its own ROF, the CTT UMFCO Strategy, the UMFCO Strategic Plans, based on the general organizational rules, UMFCO procedures and the legislation in force in the field of research, development, innovation, technology transfer and intellectual property.

CTT-UMFCO operates at the headquarters of the "Carol Davila" University of Medicine and Pharmacy in Bucharest, str. Dionisie Lupu, no. 37, Sector 2, Bucharest, Romania and in the building in Pitar Moş no. 20, Sector 2 Bucharest.

CONTEXT AND DELIMITATIONS

THE NOTION OF TECHNOLOGY TRANSFER

The evolution to e-Health 4.0, Pharma 4.0 and Industry 4.0, all Data Driven with the aim of societal development through knowledge, brings about a change in the organizational models of the health ecosystem (governmental medical system, private medical system, medical equipment industry, Pharma industry) towards competitive ones or more competitive ones in the case of those already competitive, a change that can only be made through an innovation process, innovation that can be product, service or organizational.

For the multinationals that form the health ecosystem, the process is ensured internally, and it is also viewed as a form of protection of the monopoly ensured by technological competitiveness, often distorting the market to the detriment of technological evolution in all segments of the health ecosystem.

For the remaining subsystems, national ones, those of dynamic and agile companies depending on the scale of the organization and the dynamics of achieving the competitive model, we can solve most of the stages of innovation through **TECHNOLOGICAL TRANSFER**.

From the point of view of the health ecosystem that wants change - Technology Transfer (TT) is approached as a sub-process of innovation, necessary for the continuation and completion of the innovation process (Manolea 2005), having a high level of creativity that leads to innovation, being the mechanism that supports the implementation, acceptance and use in the market of new technologies. Thus, the process is seen as one of delivering a service, that of Technology Transfer "Technology Transfer (TT) as a service", TT seen as a sub-process in the innovation process.

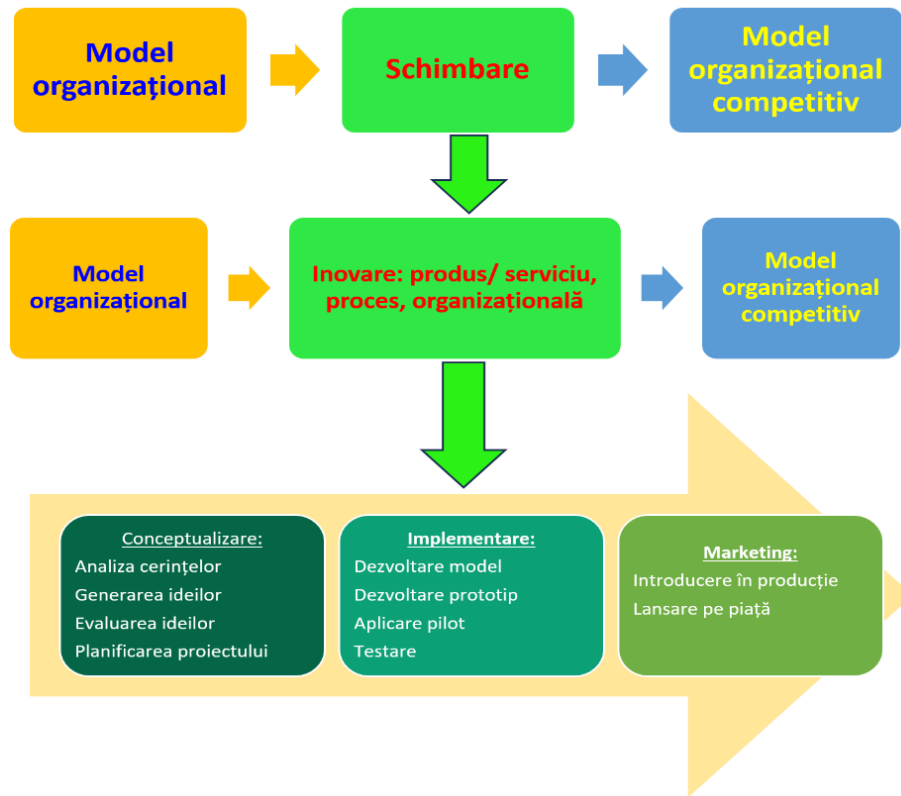


Fig. 1 – The need to change the healthcare ecosystem through innovation

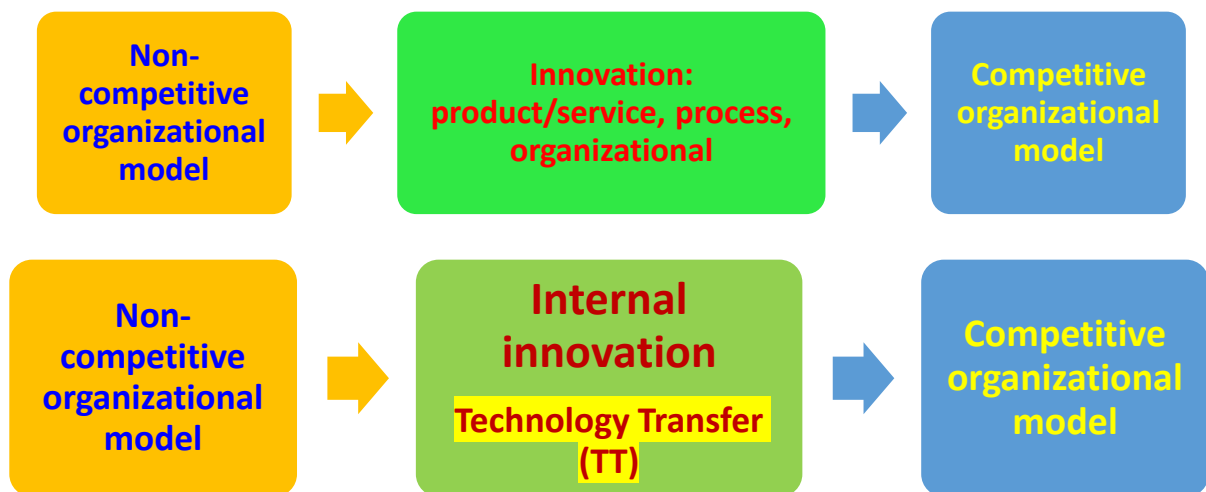


Fig. 2 – Technology Transfer Subprocess in the innovation process



Both processes, innovation and technology transfer, are extremely complex because they usually involve multiple organizations that must collaborate effectively, even though there may be different perspectives on important aspects.

The need to operationalize and develop Technology Transfer within UMFCDC derives from the role of UMFCDC in this societal evolutionary process in which the health ecosystem needs this technology transfer process and is given by the UMFCDC mission to generate value for society, in addition to the education and fundamental research provided through the already existing missions.

Starting from the assumption of the UMFCDC mission of fundamental research in the medical field, noting the excellence in research and the advanced scientific results obtained, **the natural, normal need arises to communicate and "deliver" scientific results outside the medical academic space. The Technology Transfer Center (CTT-UMFCDC) thus receives the mission of contributing to the definition, introduction and operationalization of the entrepreneurial mission of UMFCDC, defined by its capacity to generate value for society**, in addition to the fundamental education and research provided by the already existing missions. Along with the other two missions, that of providing educational support and that of fundamental research, *UMFCDC receives a new mission, the entrepreneurial (community) mission, thus becoming an entrepreneurial University* through the dynamics of the activities it will carry out in this direction, as well as through the connections related to research contracts and the transfer of knowledge and technology that it will have to develop with the specific external environment.

The research excellence within UMFCDC forms the foundation for successful exploitation through the Technology Transfer processes carried out within the UMFCDC CTT. Their exploitation is intended to create impact on the economy and society and, therefore, plays a central role in the societal mission of UMFCDC. We rely on the knowledge and skills acquired through research projects to create economic and societal value in the form of innovation in products, artifacts, processes, organizations and organizational models in the medical field.

THE NOTION OF VALORIZATION

This strategy introduces the NOTION OF VALORIZATION to complement the purpose of CTT-UMFCDC. We understand by VALORIZATION at the level of CTT UMFCDC the totality of policies, approaches, actions and activities aimed at increasing on the one hand the degree of valorization of IPR through technological transfer, licensing, assignment of copyright, innovative materials, establishment of spin-offs and on the other hand the totality of actions and activities that lead to increasing the societal impact of the implementation of these IPRs, beyond the financial aspect.

The need for the second component of valorization, namely tracking the societal impact through the implementation of these IPRs, is given by *the Strategic Research Agenda* and the 31+1 societal impact areas, grouped into 6 domains.



VISION of Valorization of RDI results at the UMFCDD level.

In UMFCDD, we combine the strengths of the four Faculties focusing on education, scientific research, medical services. Through consultation and cooperation with internal and external stakeholders, CTT UMFCDD aims to be the driving force behind UMFCDD for an international, entrepreneurial, creative and inclusive character of it, contributing to the systemic transitions needed for people and society through the leverages for valorization offered.

CTT UMFCDD is the driving force for valorization and development, providing support throughout the entire process, to create a win-win relationship for the parties involved in each stage of valorization. We do this by involving all UMFCDD partners and national and regional public institutions, the business community and other institutional and community actors - in the different stages of the valorization process.

CTT UMFCDD wants to distinguish itself by its clear focus on multidisciplinary areas that have considerable innovation potential. Through these areas and the cutting-edge research on which they are based, CTT UMFCDD interacts with companies, citizens and other partners who will benefit from Technology Transfer or Knowledge Transfer. The expertise from the different scientific disciplines of each existing or future CTT UMF partner is integrated into these multidisciplinary areas. The basic principle is that economic and social valorization are closely linked and require contributions from various scientific perspectives. Important economic and societal challenges and developments play a central role in determining the multidisciplinary areas on which we focus.

CTT UMFCDD redoubles its efforts to support and encourage the valorization of RDI results at UMFCDD level. The contribution of non-reimbursable funding through the creation of projects and project partnerships for is often an essential step to make valorization possible. For this reason, CTT aims to increase its financing capacity from all existing non-reimbursable funds through a consistent approach to marketing the funding mix and cooperation from the preparatory phase of the projects. We provide support and training for access to non-reimbursable funding to partners interested in joint projects, we provide proactive support and encourage the potential for valorization in all its phases, from the initial idea with the registration of inventions, possibly with the establishment of spin-offs, to technological follow-up after the implementation of the technology transfer.

In these efforts, CTT UMFCDD works with and for all scientific disciplines in all four Faculties, in close interaction and cooperation with internal and external partners for integration in multidisciplinary areas of valorization, cooperation with the National Investment and Reform Coordinators (PNRR), the Managing Authorities of European Programs, the Ministry of Health and the Ministry of European Projects.



CTT is fully aware of the fact that the private partners benefiting from UMFCF patents and spin-offs are largely economically motivated, being an element taken into account but without losing sight of the fact that the economic and social impact are completely dependent.

We are also fully aware of our responsibility to encourage interdisciplinarity, cooperation, responsible research and innovation (RRI), to support the SDGs and diversity in all its aspects.

The vision of CTT UMFCF represents the ideal state projected into the future that configures a desirable development of UMFCF. Our vision presupposes a realistic, dynamic thinking capable of enhancing the implementation of UMFCF's strategic development directions in the medium and long term. Thus, we see ourselves in the future as a benchmark for the implementation of UMFCF's valorization standards for its international, entrepreneurial, creative and inclusive character, contributing to the systemic transitions necessary for people and society through the valorization levers defined, developed, validated, calibrated and then offered by CTT UMFCF to UMFCF structures and its partners.

The vision of CTT UMFCF is to ensure, within a 5-year horizon, the innovative organizational transformation of UMFCF, to complement the classic missions, to offer educational support and fundamental research with the entrepreneurial mission, certifying UMFCF as the main coordinating entity of the emerging development of the medical-pharma ecosystem in the Bucharest Ilfov Region, by developing mechanisms that facilitate technological transfer within the framework of knowledge transfer, providing support in the change/development of thinking and entrepreneurial medical or systemic-governmental health actions.

CTT UMFCF MISSION

The CTT UMFCF mission derives from the UMFCF mission and contributes on the one hand to the achievement of the two classic missions of UMFCF, that of providing educational support and that of fundamental research, and on the other hand to the definition and introduction of a new, innovative mission, namely the entrepreneurial mission of UMFCF, defined by its capacity to generate value for society, in addition to the fundamental education and research provided by the already existing missions.

CTT UMFCF Mission will consist of facilitating the valorization of innovation and university research, by promoting technological transfer, developing efficient innovation management and increasing the number of new spin-off companies and patents to ensure the sustainability and viability of knowledge transfer.

CTT UMFCF will strengthen applied research and its relationship with fundamental research through translational mechanisms, to encourage innovation, but also to facilitate the economic development of UMFCF by stimulating innovative services to the community, constituting a factor for increasing UMFCF's innovation and competitiveness.



The purpose of the CTT UMFCO

The purpose of the CTT UMFCO is to define, develop, validate, calibrate and implement the mechanisms through which the new interdisciplinary and research areas at the UMFCO level, dedicated to solving existing problems and challenges, including societal ones, existing in the medical-pharma ecosystem, will ensure the transfer of knowledge from the university to this ecosystem by capitalizing on the results of scientific research obtained within the research structures of UMFCO, by transferring them to the business environment, promoting smart and sustainable development. It thus contributes to increasing the quality and competitiveness of products, processes and services in the health field, to the creation of new jobs and to sustainable economic development in a competitive environment.

Strategic directions

DS.1. Increasing the value of innovation and top research from UMFCO, promoting technology transfer, developing a high-performance management of innovation and technology transfer through the operationalization and innovative management of CTT UMFCO.

DS.2. Sustainable development of CTT by diversifying income sources, developing strategic partnerships, adapting to the evolution of the market and the healthcare industry

PROPOSED IMPLEMENTATION MODEL:

In achieving its purpose, CTT-UMFCD will implement an innovative model for the evolution of Valorization through Technology Transfer and beyond, a model based on the 4H - QuadHelix innovation model (Four Helix or 4 helices) where the actors are UMFCF, the Medical/Pharma ecosystem, the National Health System (Gov.), and citizens/patients, UMFCF having the role of delivering Technology Transfer services through CTT to the other three actors.

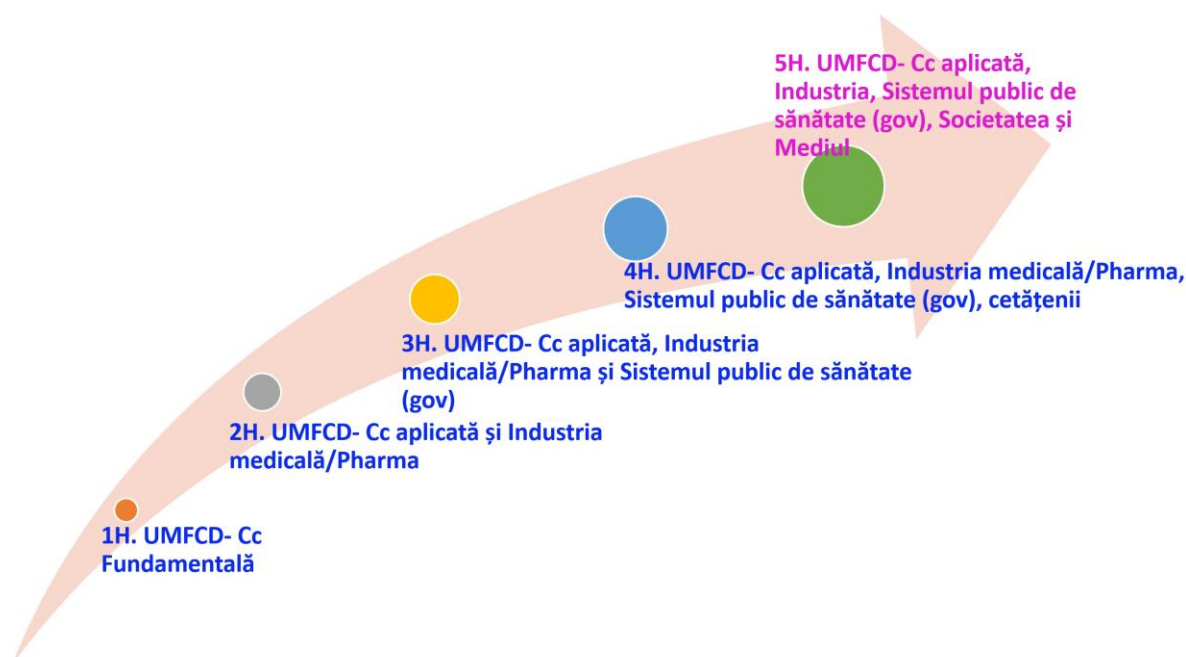


Fig. 4 – Evolution of the innovative development model of Technology Transfer

Description of evolutionary innovation models (1-5 Helix):

1H. UMFCF- Fundamental Cc

This model is one in which research is carried out at the UMFCF level or in specialized research laboratories, the results being formalized in the form of scientific articles and **validated by other experts in the field through acceptance of publication, citation of works, etc.** Moreover, by accepting such a status, internationally recognized researchers, through acceptance of publication of articles, citation of articles or other traditional forms, will be appreciated and valued for conducting fundamental research, with no reason to give up this status built over many years of work.



2H. UMFCO- Applied CC and Medical/Pharma Industry

The two components are UMFCO in which the form of research delivery moves from fundamental to applied, which will have to have a final result usable in practice and the Medical/Pharma health industry and the research results must be applied and transferred to the industry. Validation is much broader, given by principles such as quality, degree of applicability, suitability, use. Researchers have, in this context, a new challenge: to find business partners with whom to have a useful dialogue, whose needs to understand and with whom to make themselves understood. The form of the results must allow technological transfer. Most of the time, however, this model of university with applied research involves the development of adequate structures to mediate such relationships between researchers and industry – in our case this aspect is solved by establishing and operationalizing CTT -UMFCO.

3H. UMFCO- Applied CC, Medical Industry/Pharma and Public Health System (SPS/Gov)

Between the three parties, reciprocal relationships are developed with the ultimate goal of increasing the performance of all actors as a whole (Bradley, Hayter, and Link 2013). Basically, this model combines models 1 and 2, justifying the fact that, if the university collaborates with the government and industry (something specified, to some extent, by model 2) regarding the development of technologies (developed, to some extent, in model 1), through these relationships, societal welfare can be achieved. Through a coordinated collaboration at the government level, through allocations of funds and stimulation of universities and industry to collaborate in the development of technologies, innovation useful to society will be achieved. It is the so-called knowledge-based economy, the government being the one who allocates money according to private needs, through universities. Knowledge comes to have a special importance within the SPS/Gov and universities, governments being aware of this, channeling their effort towards their own objectives. However, to reach this level, the two previous states must be overcome, and the major challenges remain stimulating researchers to move from fundamental to applied research and calling on specialized structures and personnel to develop relations with the Medical/Pharma Industry that carries out economic activities close to the researchers' specific research area.

4H. UMFCO- Applied CC, Medical/Pharma Industry, Public Health System (gov), Society (citizens beneficiaries of health services)

This model is based on the 3H model (triple helix - previously), to which a component is added, citizens, being represented by patients/relatives/civil society, the general public, often represented through the media, national culture and customs, public creativity, etc.

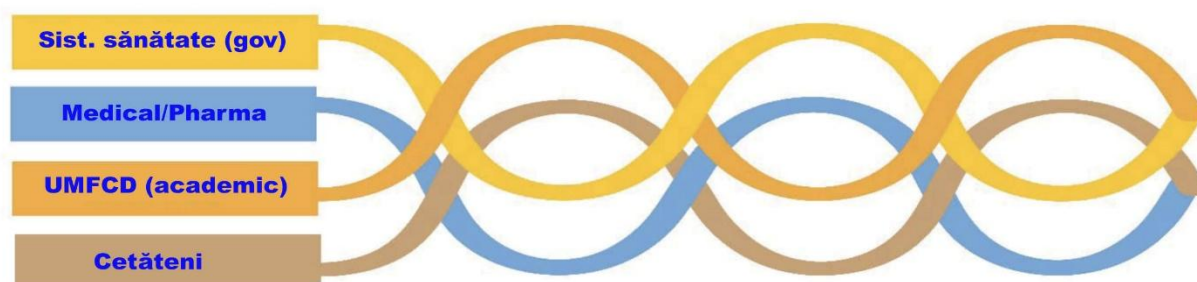


Fig. 5. The 4H model of innovation and Technology Transfer proposed by CTT UMFC

Citizens are, moreover, an increasingly active factor in validating/creating new solutions through electronic means. They promote, disseminate and consume innovation much more than they did a few years ago, stimulating or inhibiting the development of new technologies. It can be considered that, with the continuous practice of applied research, adapted to the needs of the state, the visibility of the results among citizens/the public will be increased, bringing, in the long term, in addition to the international visibility of researchers for fundamental research, a regional, local and national recognition among them.

The implementation of the 4H innovation model at the UMFC level through CTT will involve a mix between processes for stimulating classical creativity and innovation and emerging ¹and disruptive technologies ²using an Agile methodology ³, moving directly from the current 1H model directly to the 4H model, providing a catalytic support framework for research teams within the 4H model to be able to move from fundamental research (TRL1) and TRL2 - Validated experimental research to the levels that allow Technology Transfer TRL5 - Pre-clinical studies and preparation of clinical studies-TRL6.

5H. UMFC- Applied CC, Industry, Public Health System (gov), Society (citizens beneficiaries of health services) and Environment

The development of new solutions can be achieved in this context of considering the environment, but not only in the sense of protecting it and generating ecological solutions, but also in the sense of innovating and producing technologies that ensure the sustainability of old ecosystems, respectively that ensure the development of new balanced habitats.

¹Emerging technologies: those technologies or scientific discoveries that are expected to reach maturity between 2020 and 2040; and are not currently widely used or whose effects on the functions of the medical system (cancer) are not fully clear.

²Disruptive Technologies: those technologies or scientific discoveries that are expected to have a major, or perhaps revolutionary, effect on the functioning of the medical system in the period 2020-2040

³Project methodology that emphasizes teamwork, collaboration with the client, adjusting requirements, flexibility to changes. Also, in an agile project, the emphasis is on continuous improvement of team relationships, processes and results that are delivered incrementally until the final version.

1. DESCRIPTION OF THE CTT UMFCO TECHNOLOGY TRANSFER PROCESS

CTT UMFCO in the role of facilitator - bridge between technology providers represented by UMFCO and its partners and technology receivers represented by the MEDICAL/PHARMA ecosystem that apply new technologies to improve products, services, processes or the work environment

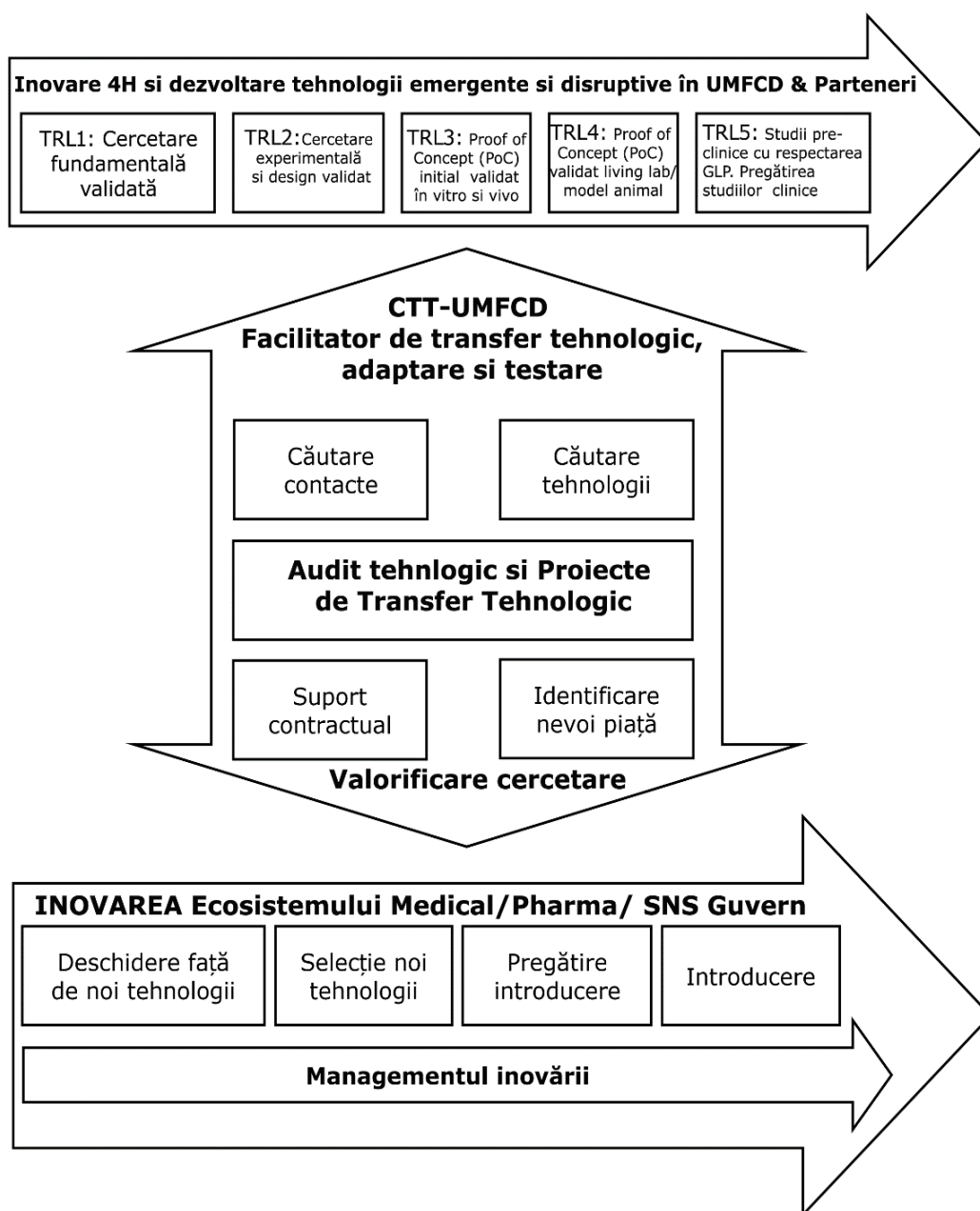


Fig. 6. Technology Transfer Logic at CTT-UMFCO



In this ecosystem depicted above, CTT UMFCDD offers for the first time (UMFCDD) services :

- assistance and consultancy for the protection and exploitation of intellectual property rights;
- assistance and consultancy for innovation and technological transfer;
- assistance and consultancy for the implementation of the innovation management system;
- assistance and consultancy for accessing and obtaining tax facilities in the field of research, development and innovation;
- assistance and consultancy for evaluating the results of research, development and innovation activities for accounting purposes and establishing the value for starting negotiations;
- assistance for digitization.

Respectively for technology receivers (Medical/Pharma, SPS/Gov.)

- Technological audit services for the purpose of introducing the results of research and development activity into the economic circuit
- Technology transfer services
- assistance and consultancy for innovation and technological transfer;
- assistance and consultancy for the implementation of the innovation management system;
- assistance for digitization.

by creating a connection between those who develop new technologies and those who need them.

2. LEGAL FORM OF TECHNOLOGY AND KNOWLEDGE TRANSFER

IPR licensing agreements between UMFCDD and Partners who have patented certain IPRs and the companies/organizations/hospitals/Government NHS that wish to use them represent the traditional form of technology transfer. This legal form is a classic one through which UMFCDD and Partners aim to achieve technology transfer, according to the traditional American model. This form of technology transfer is an extremely complex one both from a legal point of view and from the point of view of implementing such a relationship between technology providers and receivers.

IPR sale-purchase agreements between UMFCDD and Partners who have patented certain intellectual property rights, on the one hand, and companies/organizations/hospitals/Government NHS that wish to use them, on the other hand, are a form by which the technology provider (UMFCDD and Partners) transfers the IPR in full to a beneficiary. Unlike licensing, which involves the collection by UMFCDD and Partners of amounts, usually annual, according to the sales generated by the use of the patent by the beneficiary, the acquisition of the technology by the latter involves only one payment upon signing the technology sale-purchase agreement.



JOINT-VENTURE: Legal associations between UMFC D and Partners, on the one hand, and other organizations interested (companies/organizations/hospitals/SNS Government) in the respective technologies . This form constitutes an alternative to the other forms mentioned previously (licensing and sale) , representing a form of governance of technological transfer that involves a close collaboration between UMFC D and Partners who develop the incipient forms of the technology and those who wish to transform these technologies into products and services sold on the market . In a way, UMFC D and its Partners, as technology providers, assume , through this association, a much higher involvement than in any of the previously mentioned forms , but such an approach will be preferred if the technology provider has high expectations regarding the technology, having, at the same time , similar experiences regarding this way of collaboration with interested beneficiaries . On the other hand, the beneficiary will prefer this approach if acquisition or licensing is excluded for certain reasons, respectively if it is in the interest of UMFC D and its Partners to continue developing the technology and transforming it into innovative products and services;

Consultancy and training programs carried out by CTT-UMFC D also represent a form of technology transfer. These forms of **technology** transfer governance are those that, although they do not involve the registration of technologies through intellectual property by UMFC D as a technology provider, rather involve the transfer of new competencies for the beneficiary (knowledge , skills or values) usable by him in his daily activities in order to achieve the innovative organizational change sought .

The transfer/secondment of employees/researchers from UMFC D to an organization in the medical ecosystem (companies/organizations/hospitals/Government NHS) represents a form of technological transfer. Whether we are talking about organizations that outsource the above-mentioned services to CTT UMFC D, thus involving a certain contact between the employees of the beneficiaries and UMFC D employees, or whether we are talking about mutually agreed exchanges (secondments) between UMFC D and beneficiary employees, from various positions (especially in state organizations), these forms constitute an opportunity for the exchange of good organizational practices in both directions.

Establishment of Spin-Off or Start-Up companies

It is a form of IPR valorization and UMFC D encourages academic/research staff and students, where applicable, to consider commercializing IPR by forming a company specifically created for this purpose, taking into account the two legal forms **Spin-off** (*where UMFC D is associated in the company to be established according to the Methodological Norms regarding the establishment and development of spin-offs in the field of research, development and innovation, of 16.04.2021, part of Order 28/07.05.2021*) and **Innovative Start-up** (*where UMFC D is not associated but the start-up's activity is oriented towards innovation through R&D projects carried out individually or in partnership with UMFC D, for the purpose of innovating processes and*



products in industry sectors ⁴that have growth potential and is based on the transfer of research and development results obtained in UMFCDC or on patented ideas, in order to create new or significantly improved products and services to launch on the market).

Through this form of exploitation of IPR, UMFCDC provides a researcher (or a group of researchers) with the opportunity to leave UMFCDC, where they developed a research project and obtained a result, in order to continue the researched solution within their own company until its completion, in order to produce and commercialize the results on the market.

CTT-UMFCDC provides free consultancy for the establishment and administrative management of these companies by promoters - researchers within UMFCDC and they must make a request to CTT-UMFCDC which must include:

- complete list of IPR belonging to UMFCDC that is proposed to be used by the respective newly established company, which can be :
 - a patent
 - patent application
 - doctoral thesis (of the project director – the initiator of the spin-off/start-up)
 - The rights to use the research results in the project for the case of research, carried out in the public institution where the spin-off initiator comes from and financed through a public program (the spin-off initiator was the project director)
- innovative business proposal, based on advanced technologies, or a document regarding an innovative business strategy, developed by the promoters;
- Business plan
- Documents proving that the newly established company has a space in which to carry out its activity - it can be a rental contract or a lease with UMFCDC;
- Certificate from the institution – the project director is an employee of a public research organization
- list of founding members of the newly established company and how they will be involved/employed;
- Proposal for Association Agreement/Technology Transfer Agreement/IPR License Agreement with UMFCDC, as applicable;

3. ANALYZE THE CURRENT STATUS AND THE DESIRED EVOLUTION

The strategic and operational objectives in this strategic plan are based on the CTT UMF vision regarding valorization and the analysis of the UMFCDC position.

The analysis of this starting position in 2023 was translated into an analysis that was taken as a starting point for determining the strategic and operational objectives for the 2024-2028 stage.

⁴ We understand by industry the ecosystem formed by the national, public and private healthcare system, the industry producing devices, equipment, substances, medical consumables and the pharmaceutical industry, public and private.



The proposed slogan for the stage is "Defining and Developing, Supporting and Stimulating the Valorization of RDI at UMFC D".

The annual reports and ex-post evaluation demonstrate that all UMFC D partners invest in their valorization strategy and have attracted expertise in valorization, invested in the professionalization of their researchers through internal training modules, as well as the dissemination of information, making it necessary to form more interdisciplinary teams at the UMFC D level in order to continue to respond to the increasingly complex problems required by society.

The starting position of CTT UMF in terms of valorization of research results is characterized by the following strengths that are intensively exploited:

- The involvement of UMFC D management allowed CTT UMFC D to establish a clear vision on valorization, a clear interface strategy, and to secure through partnerships the qualified personnel it needs but cannot directly employ due to the economic crisis and the instability of the political environment.
- The creation and organization of the CTT UMFC D under the direct subordination of the Rectorate has had a positive effect on identifying the potential for valorization within the UMFC D and has already created tangible results through the projects in which the CTT participates or which it directly generates (over 130 million lei at the end of 2025).
- The choice to focus dedicated activities on areas of valorization where UMFC D can make a difference is translated by **the introduction of the concept of Technology Transfer (TTO) based on the short-term ownership of IPRs with rapid valorization (Flipped-TTO)**, motivated by their technological depreciation, and CTT is fully committed to this. It is expected that the future innovation hubs that will be accessed by CTT will generate a very strong catalytic effect on the valorization parameters and the application of Flipped TTO will reduce the risks of depreciation.
- Courses for valorization managers were supported,

Strategic directions 2024-2027

DS.1. Increasing the value of innovation and top research from UMFC D, promoting technology transfer, developing a high-performance management of innovation and technology transfer through the operationalization and innovative management of CTT UMFC D.

DS.2. Sustainable development of CTT by diversifying income sources, developing strategic partnerships, adapting to the evolution of the market and the healthcare industry

4. GENERAL AND SPECIFIC OBJECTIVES



General objective: Facilitating the valorization of innovation and university research, by promoting technology transfer, developing efficient innovation management and increasing the number of new spin-off companies, patents and technology transfer contracts to ensure the sustainability and viability of knowledge transfer.

4.1. SPECIFIC OBJECTIVE 1: Increasing internal and external interactions and increasing the societal impact of RDI results in order to increase their valorization.

CTT UMFCDD will focus on a limited number of priority multidisciplinary areas that have a high potential for valorization. These areas are coordinated with the needs of our context given by the National Strategy, Health, closely correspond to today's problems detailed in the *Societal Challenge Priorities contained in the Strategic Research Agenda (3I+1) within the SNCSII* and will therefore also be called "valuation areas". These problems are also considered to be societal challenges, as defined in the Principles of Responsible Research and Innovation. In addition, with its multidisciplinary valorization areas, CTT aims to maximize its response to regional, national and international initiatives, including the Smart Specialization Strategy 2021-2027

The National Strategy for Research, Innovation and Smart Specialization (SNCSII) 2022-2027, the National Strategic Agenda, the Health Operational Program, the Regional Strategy for the Ilfov-Bucharest Region, the National Recovery and Resilience Program PNRR, the Smart Growth, Digitalization and Financial Instruments Operational Program 2021-2027, as well as the European Union programs - The European Union Framework Programme for Research and Innovation 2021 - 2027, Horizon Europe Strategic Plan 2021-2024, EU4Health, the Digital Agenda, the Strategic Plan 2020-2024 of the Directorate for Health and Food Safety (DG Sante) are taken into account to be impacted by the measures in the UMFCDD Valorization Strategy

UMFCDD aims to improve the relevance and economic and societal impact of fundamental and applied research by integrating a variety of disciplines around priority areas of multidisciplinary valorization. To this end, it brings together its own research-related strengths with technology transfer requests. Where possible, we seek to connect to the societal challenges of SNCSII, to the long-term plans of Pharma/Medical, GOV, strategic research centers, clusters, sectoral federations, central and regional authorities but also to the European strategic research agendas developed in the context of Horizon Europe. This clear focus will make us more visible to all stakeholders and will bring us to the forefront among stakeholders seeking expertise in these areas. This strategy will obviously also allow for new initiatives and the incorporation of new developments involving Technology Transfer.

4.1.1 Operational objective 1.1: Connecting to Open Innovation Hubs and using them as catalysts for the application of the valorization ecosystem.

The CTT Manager will extend the interaction with partners and other stakeholders within a four helix model through multidisciplinary collaboration, making connections between disciplines to facilitate the translation of technologies and know-how to the market and will take into account the economic feasibility while verifying that the projects are in line with the Sustainable



Development Goals (SDGs) interacting as much as possible with the external UMFCDC community to bring societal challenges to the UMFCDC research collectives. The task of the CTT management is to place the UMFCDC Valorization Areas at the center of national and international attention, using national and international funding, support from clusters, to strengthen the capacities offered. It will aim to build a strong network with eHealth and business experts to scale the projects higher on the TRL scale and closer to the market. The success of these initiatives will lead, directly or indirectly, to a higher income and attracting more funding. Also, interaction with the various strategic groups should lead to more service projects with private partners and licensing agreements.

Results:

- 1) 10% annual increase in income compared to 2023 and funding from the EU Framework Programme budget until 2028.
- 2) a 50% increase by 2028 in the budget of partnership projects compared to 2023.

4.1.2 Operational Objective 1.2: Increasing interaction with UMFCDC partners through the export of valorization managers to partners (secondment/delegation/employment on joint projects).

CTT encourages researchers to conduct research in an entrepreneurial environment within private partners in various joint research projects – learning by doing. As a result, more and more researchers will want to establish their own start-ups, or spin-offs, even when they are still employed by the university. We are convinced that a cross-activity between entrepreneurship and research will ultimately lead to better projects and to researchers who will have the opportunity to adapt fundamental research to the applied needs of industry, with the mention of an important point that may be the increasing impact of conflict of interest issues in such hybrid entrepreneurial approaches. For this, we need to develop clearer provisions so that everyone is sufficiently informed in advance and knows what things cannot be done and what can be done in a hybrid research-entrepreneurship ecosystem.

Results:

- 1) By the end of 2026, new guidelines will be introduced for managing conflicts of interest in case of collaborations on PPP projects.

4.2. SPECIFIC OBJECTIVE 2: Developing an efficient technology transfer infrastructure and management in order to increase the number of new spin-off companies, patents and technology transfer contracts

4.2.1 Operational objective 2.1: Creation of the UMFCD Technology Transfer Development Fund together with private partners, to create and consolidate a Technology Transfer infrastructure within UMFCD.

The creation of the UMFCD Technology Transfer Development Fund will allow the creation of a technology transfer infrastructure necessary to reduce the gap between the TRL level of fundamental research (TRL1-2) and that required for successful technology transfer (TRL5-6), a level from which there is investment interest from venture capital or the traditional Pharma/medical industry.

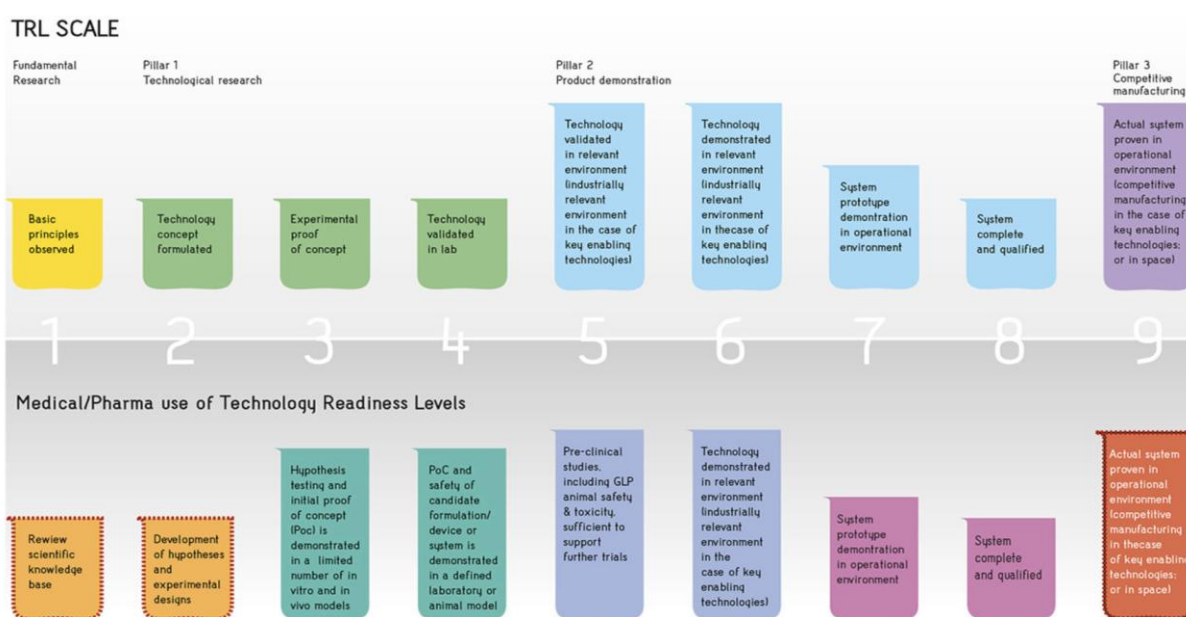


Fig. 7 Correlation of technological development levels with the field of medical research

From this Fund, Financing Schemes will be developed that will lead the valorization projects to a TRL higher than 5 (thus avoiding the “Valley of Death” in the TRL scale – from 2 to 5) and closer to the establishment of a company or the preparation of a license agreement. However, in a final phase, CTT must be able to work on the spin-off projects in a focused manner, in a real company, together with Pharma/Medical experts or external co-founders to prepare the spin-off for investors. This Fund will differentiate itself from the already existing venture funds in the private RDI financing market, as it will mainly invest in the implementation of the team and the improvement of the business cases.

The proposal is to have two investment strategies. One strategy dedicated to the classic spin-off trajectory, but in which this Fund will invest much earlier than classic funds to prepare investors, and the other strategy will be focused on improving the TRL and the Business-case of a project by an external multidisciplinary team with Pharma-Med industrial experience. In this second trajectory the objective is to obtain more interest for already established companies and subsequently negotiate a very valuable license agreement. The UMFCD Technology Transfer



Development Fund will be an independent investment fund, in collaboration with strong regional corporate partners and may include MS and CASS, will pay particular attention to high ethical standards, ensuring diversity in the spin-off founding teams and investing responsibly, positioning itself as an impact fund also taking into account the SDGs (sustainable development goals).

The success of the FUND will be measured by the increase in the number of licensing contracts, the number of companies created and the external investments attracted.

The creation of spin-off companies will lead to greater engagement of high potentials in the Bucharest Ilfov and SOUTH Muntenia region, strengthen regional ecosystems and facilitate interaction between different Pharma-Med industrial actors.

Results:

- 1) Documentation and proposal of the project to establish **the UMFCF Technology Transfer Development Fund** together with UMFCF Partners, MS, CASS, other public and private partners

4.2.2. Operational objective 2.2: Creation, operationalization and development of a Technology Transfer infrastructure

In order to achieve the goal of having research results as close as possible to TRL 5 or 6, it is necessary to develop a technology transfer infrastructure that works in an integrated manner with the research infrastructure at the UMFCF level.

The proposed technology transfer infrastructure is essential to facilitate the transformation of scientific discoveries within UMFCF into medical products and services that can improve patients' lives. By implementing this infrastructure, UMFCF can become a leader in medical innovation and contribute significantly to the economic development of the region.

The spin-offs facilitating technology transfer will be brought together in **the UMFCF Business Accelerator** (funding will be sought for its establishment and operationalization)

Interaction within the spin-off community will be intensified to support spin-offs through mentoring by their senior research colleagues and by the CTT. Ultimately, a network of experienced researcher-entrepreneurs who can support new ideas in the BI and national ecosystem will be created, which will be transformed into a collaborative network - the **UMFCF Technology Transfer Network**. Open Innovation Hubs and Valorization Managers are the actors of the Flipped TTO approach of the CTT UMFCF. Funding will be sought for the establishment of a Spin-Off Network, and a Business Accelerator, so that they can connect more to the Open Innovation Hubs and Valorization Areas.

Results:



1) A UMFC D Business Accelerator operationalized by 2027:

- **Motivation:**
 - Stimulating entrepreneurship in the medical field.
 - Facilitating the transformation of scientific discoveries into viable medical products and services.
 - Attracting private investment in medical research.
 - Creating well-paid jobs.
- **Benefits:**
 - Increasing innovation in the medical field.
 - Improving access to quality healthcare.
 - Stimulating the local economy.
- **Activities:**
 - Providing training and mentoring to entrepreneurs in the medical field.
 - Facilitating access to financing.
 - Connecting entrepreneurs with potential investors and partners.
 - Supporting the development of business plans of start-ups and spin-offs generated by UMFC D research.

2) A collaborative network - UMFC D Technology Transfer Network operationalized by December 2026:

- **Motivation:**
 - Facilitating collaboration between researchers, entrepreneurs, investors and other key players in the medical field.
 - Stimulating the exchange of knowledge and experiences.
 - Promoting technology transfer.
- **Benefits:**
 - Accelerating the development of new medical products and services.
 - Reducing research and development costs.
 - Increasing the chances of success of technology transfer projects.
- **Activities:**
 - Organizing networking events.
 - Facilitating access to resources and expertise.
 - Supporting collaboration between 4H sectors.

3) At least one spin-off with TRL 4 applied research by December 2026:

- **Motivation:**
 - Demonstrating UMFC D's ability to transform scientific discoveries into viable medical products and services.
 - Attracting private investment in medical research.
 - Creating well-paid jobs.



- **Benefits:**
 - Increasing UMFCFCD's reputation as a leader in medical innovation.
 - Stimulating local economic development.
- **Proposals:**
 - A company developing a new drug to treat cancer.
 - A company developing an innovative medical device.
 - A company that offers personalized diagnostic services.

4) Several Living Labs related to the specifics of UMFCFCD research (*InnoTher Center for Research and Development of Innovative Therapeutic Structures, Interdisciplinary Center for Research and Development in Dentistry (CICDS), Innovation and e-Health Center, Innovation and e-Health Service, Medical Simulation Department, 3D Printing Laboratory, FIES Foundation for Education and Health, other research centers at UMFCFCD level*):

- **Motivation:**
 - Facilitating the testing and validation of new medical products and services in real environments.
 - Obtaining feedback from users and continuously improving products and services.
 - Reducing the risks associated with launching new products and services on the market.
- **Benefits:**
 - Increasing the chances of success of technology transfer projects.
 - Accelerating the development of new medical products and services.
 - Reducing research and development costs.
- **Proposals:**
 - Living Lab - *3D Printing Laboratory* .
 - Living Lab *InnoTher* .
 - Living Lab - *Medical Simulation* .

4.2.3. Operational objective 2.3: Creation and operationalization of a collaborative Technology Transfer platform

Contractual Due Diligence prior to signing technology transfer agreements is becoming increasingly complex. More and more organizations are placing intellectual property claims and commercialization restrictions in their contracts. Therefore, it is important for research contracts to be identified and as soon as possible linked to the technology for which a valorization trajectory is initiated (patent/utility model application, etc.). To achieve this, we need IDP management software and should be able to connect our IP management tools with the research contract databases and their financial data.

From 2026, CTT will propose a platform with:

Main functions:



- Intellectual Property portfolio management at UMFCF level
- Listing of technology transfer service offers, technology transfer consultancy and other specific CTT services, collection tool from all UMF CD faculties and from UMFCF teaching staff/researchers
- Section for listing opportunities offered by healthcare partners to increase collaboration with UMFCF
- Section with the matching between the research activity at UMFCF and the requirements of industrial partners in health/Pharma. The section must have a scoring tool in which the description of the requirements of external partners is followed by the automatic matching with the research field of UMFCF
- Creation and support section for spin-off companies generated by UMFCF, increasing their visibility and opportunities for joining and creating new collaboration networks.

The UMFCF Technology Transfer Platform must:

- to provide transparency for all members of the collaborative innovation and technology transfer ecosystem,
- to enable multiple digital communication channels for all stakeholders by providing all digital events with workspaces to increase the success rates of all CTT-external partner collaborations.

TECHNICAL FUNCTIONS. UMFCF TECHNOLOGY TRANSFER PLATFORM WILL

- allows the creation of databases for partners in the Pharma and Health industry, universities, research institutes, researchers and spin-off companies.
- allows the definition and configuration of trading markets (marketplaces) for technology transfer offers, Intellectual Property and related services.
- It allows automatic matching between players in trading markets for Intellectual Property (IP) in order to reduce search times.
- Allows the provision of e-learning courses
- Allows the creation of digital acceleration programs.

Results:

- 1) CTT UMFCF collaborative Technology Transfer Platform operational until Dec 31, 2026

4.3. SPECIFIC OBJECTIVE 3. Increasing competitiveness, visibility and diversification of funding sources for RDI and Technology Transfer at the UMFCF level

IPR valorization is increasingly a complex business. Not only is the pre-incubation trajectory within the UMFCF longer, but the legal framework is becoming more complex, technologies are developed simultaneously by several parties and even research funding organizations are already claiming intellectual property rights early in the process. The profile of a TT expert and valorization manager should be seen as a multitasker who is an expert in different aspects, such as



broad domain-specific scientific expertise, business development, negotiation skills, project management, financial and economic expertise, legal expertise and at the same time demonstrating leadership. The TT expert does not work on a few projects, but on many projects simultaneously grouped into programs. It is difficult for someone to encompass the excellence of expertise in all these skills. It is therefore necessary to invest in the training of CTT team members and we will bring together experts in dedicated cells, depending on their knowledge and skills required for a specific domain. This will help to have the right person and team for each valorization project. Not all the necessary skills need to be present in one person, but in the specific cell of a valorization project all the expertise should be available.

4.3.1. Operational objective 3.1 Increasing collaborative working skills for teams dedicated to technology transfer in priority research areas.

Many research project managers need more expertise in their teams to valorize research results in specific fields. A license agreement for a software tool is totally different from a license agreement in the biomedical field. We need to improve the skills of the valorization experts within the CTT and increase the knowledge on the valorization of unpatented IPR. Given the ubiquity of software and the increased importance of medical software, expertise in the valorization of medical software (3D virtual modeling, 3D model creation in the 3D Printing Lab, other specific AI and BIG DATA software and algorithms with application in medical services) should be increased.

Valorization is a team effort, and managers, experts, and researchers involved should work collaboratively to ensure that research results are as close as possible to TRL 4 or 5 levels in order to bring valorization projects to completion.

Expected results:

1) By the end of 2026, there should be a real matrix structure in collaboration with the Interdisciplinary Center for Research and Development in Dentistry (CICDS), the Innovation and e-Health Center, the Innovation and e-Health Service, the Medical Simulation Department, the 3D Printing Laboratory, and more, which should function as an integrated unit for harmonizing fundamental research results with TRL levels.

4.2.2. Operational objective 2.2: Increasing support for participants and coordinators of EU projects or EU grants

Currently, CTT predominantly provides support for the writing and MP phase of European projects, but there is a growing need for support in the implementation phase and in particular in project management. CTT is already developing its services in the start-up phase of projects, but there is also a growing need for project managers to be assisted in the management of EU projects. In the coming years, CTT will help develop a pool of experts in the implementation and valorisation of research results and should deal with both administrative and scientific management, including communication, dissemination and reporting.



UNIVERSITY OF MEDICINE AND PHARMACY
" CAROL DAVILA" from BUCHAREST
Technology Transfer Center



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Expected results:

- 2) Several EU/national projects submitted and successful with support from CTT.
- 3) Adequate capacity available in the UMFCD core team to keep up with a growing number of project applications and approved projects.



Annex 1- Plan of Measures ⁵- Operationalization and Sustainable Development of CTT through diversification of income sources, development of strategic partnerships, adaptation to the evolution of the market and the health industry

1. Planning and evaluation

Measure 1.1.: Defining the purpose and objectives of the CTT

Activity 1.1.1.: Organizing brainstorming sessions and consultations with stakeholders

Responsible: CTT Director

Required skills in:

- Facilitating discussions and obtaining input from all participants
- Synthesizing information and identifying key points
- Effective communication of the CTT vision
- Identifying needs and opportunities in the field of medical services
- Assessment of technology transfer potential
- The contribution of expertise in communication and public relations
- Facilitating dialogue with stakeholders
- Promoting the image of the CTT

Activity 1.1.2.: Conducting a SWOT analysis regarding the application of the 4H model in the Innovation strategy of CTT-UMFCD

Responsible: CTT Director and Research-Development-Innovation Directorate

Required skills in:

- **Medical researchers:**
 - In-depth knowledge of the medical field and market needs
 - Identifying the strengths and weaknesses of the CTT
 - Assessing opportunities and threats from the external environment
- **Experts in technology transfer and innovation management:**
 - Expertise in evaluating technology transfer projects
 - Identifying available resources and partnerships
 - Analysis of risks and potential for success
 - Knowledge of the business environment and market trends
 - Feasibility assessment of CTT plans
 - Elaboration of development strategies

Activity 1.1.3.: Defining the vision, mission, purpose, strategic directions of CTT UMFCO.

⁵This plan of measures will be integrated into the CTT-UMFCD operational plan after the approval of the Strategy



Responsible: CTT Director

Required skills in:

- Defining the vision, mission, purpose, strategic directions of the CTT
- Identifying the skills and experience required for each position
- Translating the CTT vision into specific job profiles
- Defining selection criteria

2. Operationalization and management

Measure 2.1.: Development of technology transfer processes and procedures

Activity 2.1.1.: Development of evaluation processes for innovation and technology transfer projects

Responsible: Technology Transfer Expert

Required skills in:

- Defining project evaluation criteria (novelty, feasibility, potential impact, etc.)
- Development of a scoring system for project evaluation
- Identifying the internal resources necessary for project implementation

Activity 2.1.2.: Development of operational procedures for technology transfer

Responsible: Technology Transfer Expert

Required skills in:

- Drafting and negotiating technology transfer contracts
- Ensuring compliance with applicable legislation
- Protecting CTT's interests

Activity 2.1.3.: Developing intellectual property licensing processes

Responsible: Marketing-licensing Manager

Required skills in:

- Identifying and protecting intellectual property generated by CTT
- Negotiating licensing agreements with partners
- Monitoring the use of intellectual property

Measure 2.2.: Implementation of marketing and promotion strategies

Activity 2.2.1.: Developing the marketing plan



Responsible: Marketing-licensing Manager

Required skills in:

- Defining the target group of CTT
- Identifying the most effective marketing channels
- Developing the marketing budget

Activity2.2.2.: Implementing marketing campaigns

Responsible: Marketing-licensing Manager

Required skills in:

- Development of marketing materials (brochures, website, etc.)
- Carrying out online and offline advertising campaigns
- Participation in specialized fairs and conferences

Activity2.2.3.: Measuring the performance of marketing campaigns

Responsible: Marketing-licensing Manager

Required skills in:

- Collecting and analyzing marketing data
- Measuring the results of marketing campaigns
- Identifying opportunities for improvement

Measure 2.3.: Establishing a monitoring and evaluation system

Activity2.3.1.: Defining key performance indicators (KPIs)

Responsible: CTT Director

Required skills in:

- Identification of key indicators that reflect the strategic objectives of the CTT
- Setting specific targets for each KPI

Activity 2.3.2.: Collecting and analyzing performance data

Responsible: Marketing-licensing manager, intellectual property manager

Required skills in:

- Collecting relevant data from various sources (project evaluation system, CRM system, etc.)
- Analyzing data and generating performance reports



Activity2.3.3.: Presentation of performance reports to the CTT director

Responsible: Marketing-licensing manager, intellectual property manager

Required skills in:

- **Presentation Specialist:**
 - Making clear and concise presentations that reflect the results of the analysis
 - Effective communication of conclusions and recommendations to the management team

Additional considerations:

- It is important to involve all members of the CTT team in the operationalization and management process, to ensure effective communication and close collaboration.
- Constant monitoring of the CTT's performance and adaptation of strategies based on the results obtained are necessary.
- It is important to create an organizational culture based on transparency, accountability and innovation.

3. Sustainable development of CTT:

Measure 3.1.: Diversification of income sources

Activity3.1.1.: Identifying potential sources of income

Responsible: RDI partnerships expert

Required skills in:

- Defining the income diversification strategy
- Identifying potential partners
- Analysis of risks and opportunities associated with different sources of income
- Developing financial projections

Stages:

1. **Assessment of the CTT's internal resources and competencies:**
 - Identifying the CTT's areas of expertise
 - Evaluation of available human and material resources
2. **Market and customer needs analysis:**
 - Identifying potential customers and their needs
 - Studying competition and market trends
3. **Generating ideas for new sources of income:**
 - Brainstorming and open discussions with the CTT team
 - Analysis of medical trends and innovation opportunities



4. **Evaluating ideas and selecting the most promising ones:**
 - Feasibility and viability analysis of each idea
 - Estimating income potential and risks involved
5. **Developing an action plan for implementing selected revenue sources:**
 - Establishing specific objectives and implementation strategies
 - Allocating necessary resources and defining responsibilities
6. **Monitoring and evaluating results:**
 - Tracking progress made in implementing new revenue sources
 - Measuring performance and identifying opportunities for improvement

Activity 3.1.2.: Development of grant and consultancy programs

Responsible: CTT Director

Required skills in:

- **Project Manager:**
 - Grant proposal writing and consulting
 - Partner relationship management
 - Monitoring and evaluating program results

Activity 3.1.3.: Establishing strategic partnerships

Responsible: CTT Director

Required skills in:

- **CTT Director:**
 - Identifying potential strategic partners
 - Negotiating partnership agreements
- **RDI partnerships expert:**
 - Developing and maintaining relationships with partners
 - Facilitating collaboration and knowledge exchange

Measure 3.2.: Implementation of an innovation management system

Activity 3.2.1.: Identifying innovation opportunities

Responsible: CTT Director, TT expert, DCDI Directorate

Research experts:

- Conducting basic and applied research in medical fields relevant to CTT
- Analyzing market trends and customer needs to identify innovation opportunities
- Using brainstorming and problem-solving methods to generate innovative ideas
- Developing prototypes and innovative solutions to test and validate concepts

CTT/Innovation Manager:



- Assessing the commercial potential of innovation opportunities identified by the research team
- Conducting market analyses and feasibility studies to determine the economic viability of innovations
- Identifying the resources needed to implement innovations, including funding, staff, and infrastructure
- Developing innovation implementation strategies, including marketing, sales and production plans

Stages:

- 1. Clear definition of the CTT's innovation objectives:**
 - Determining the types of desired innovations (product, process, business model)
 - Identifying areas of strategic interest for CTT
- 2. Implementing an idea collection process through the CTT platform:**
 - Creating a suggestion system for employees, researchers and external partners
 - Organizing brainstorming sessions and workshops dedicated to innovation
 - Using online collaboration platforms to facilitate the exchange of ideas
- 3. Evaluation and selection of ideas:**
 - Application of previously established selection criteria (commercial potential, technical feasibility, available resources)
 - Using idea evaluation methods, such as the weighted point method or SWOT analysis
 - Involvement of the CTT management team in the selection process
- 4. Development and implementation of innovation plans:**
 - Developing detailed plans for each selected innovation, including specific objectives, implementation stages, required resources and performance indicators
 - Allocating the necessary resources to implement innovation plans
 - Monitoring progress and making necessary adjustments based on the results obtained

Activity 3.2.2.: Project portfolio management

Responsible: intellectual property manager

Required skills in:

- Complex project planning and management skills
- Knowledge of project management methodologies (Agile, Waterfall, etc.)
- Communication and collaboration skills with interdisciplinary teams
- Ability to identify and manage project risks
- Project progress monitoring and reporting skills

Stages:

- 1. Detailed planning of each innovation project:**
 - Clearly defining project objectives, tasks, resources and timeline
 - Identifying potential risks and developing contingency plans



- Establishing performance indicators to monitor project progress
- 2. **Execution of innovation projects:**
 - Allocation of resources necessary for project implementation
 - Monitoring progress and making necessary adjustments based on the results obtained
 - Regular communication with the project team and stakeholders
- 3. **Evaluation and completion of innovation projects:**
 - Measuring project performance against established objectives
 - Identifying lessons learned and opportunities for improvement for future projects
 - Preparation of final project reports and dissemination of results

Activity3.2.3.: Promoting the culture of innovation within the CTT

Responsible: Marketing-licensing manager

Required skills in:

- Effective and persuasive communication skills
- Knowledge of internal and external marketing
- Event organization and management skills
- Ability to create a positive brand image for CTT
- Skills in using digital communication tools

Stages:

1. **Definition of the desired innovation culture:**
 - Establishing the values and principles that will guide CTT's innovation culture
 - Defining the behaviors and attitudes expected from employees
 - Identifying communication strategies to promote innovation culture
2. **Communicating the benefits of innovation:**
 - Highlighting the importance of innovation for the success of CTT
 - Presentation of successful examples of innovation within the CTT
 - Communicating the individual benefits of innovation to employees
3. **Creating an environment conducive to innovation:**
 - Encouraging employees to express their ideas and take risks
 - Providing learning and development opportunities for employees
 - Ensuring the necessary resources for implementing innovations
4. **Recognizing and rewarding innovation:**
 - Creating a rewards system to recognize and reward employees who contribute to innovation
 - Organizing events dedicated to innovation to celebrate CTT's achievements
 - Promoting CTT innovations in the media and within the community
5. **Collaboration with external partners:**
 - Involving external partners in the innovation process
 - Facilitating the exchange of knowledge and ideas with external partners
 - Promoting collaboration between CTT and other innovative organizations

Example of concrete activities:



- **Organizing brainstorming sessions and workshops dedicated to innovation**
- **Launching a mentoring program to support employees who want to develop innovative ideas**
- **Creating an internal blog to showcase ideas and innovations within the CTT**
- **Participation in conferences and events dedicated to innovation**
- **Developing partnerships with universities and other research centers**

Measure 3.3.: Development of strategic partnerships

Activity 3.3.1.: Identifying potential partners for the Development of strategic partnerships

Responsible: partnership expert

Required skills in:

- **Clearly defining the objectives of strategic partnerships:**
 - Identifying specific needs of the CTT that can be addressed through partnerships
 - Establishing the types of benefits desired from partnerships (e.g. access to new markets, financial resources, know-how)
 - Defining the types of desired strategic partnerships (e.g. joint ventures, strategic alliances, licensing agreements, spin-offs)
- **Identification of potential strategic partners:**
 - Using the personal contact networks of the management team members
 - Research of companies, universities and other relevant organizations in the medical field
 - Participation in conferences and events in the field
 - Monitoring market trends and identifying potential new players
 - Using the CTT collaborative platform
- **Preliminary assessment of potential strategic partners:**
 - Analysis of the resources and skills of each potential partner
 - Assessing cultural compatibility and values
 - Estimating the potential for collaboration and mutual benefits

CTT Director:

- **Developing and maintaining relationships with potential partners:**
 - Establishing initial contacts with potential strategic partners
 - Organizing meetings and discussions to present the CTT and collaboration opportunities
 - Maintaining regular communication with potential partners
- **Facilitating collaboration and knowledge exchange:**
 - Identifying areas of mutually beneficial collaboration
 - Organizing joint workshops and seminars
 - Facilitating the exchange of information and know-how between CTT and potential partners



Stages:

1. **Clearly defining the objectives of strategic partnerships:**
 - Conducting a strategic analysis of the CTT to identify needs and opportunities
 - Establishing selection criteria for potential strategic partners
 - Developing a strategy for identifying and approaching potential partners
2. **Identification of potential strategic partners:**
 - Using various information sources to identify potential partners (e.g. databases, specialized publications, events)
 - Prioritizing potential partners based on established criteria
3. **Preliminary assessment of potential strategic partners:**
 - Conducting SWOT analyses of potential partners
 - Collecting information about the reputation, organizational culture and financial performance of potential partners
 - Assessing the potential risks and benefits of collaborating with each partner
4. **Establishing contacts with potential strategic partners:**
 - Directly contacting potential partners by email, phone or through contact networks
 - Participation in networking events and conferences in the field
 - Sending informative materials about CTT and collaboration opportunities
5. **Detailed assessment of potential strategic partners:**
 - Conducting interviews with representatives of potential partners
 - Visiting the headquarters of potential partners
 - Requesting additional information about potential partners' resources, skills, and development plans
6. **Selecting strategic partners:**
 - Final evaluation of potential partners based on established criteria
 - Selecting strategic partners that offer the most benefits for the CTT
7. **Development and finalization of partnership agreements:**
 - Negotiating partnership terms and conditions
 - Clearly defining the roles, responsibilities and obligations of each party

Activity 3.3.2.: Development of specific strategic partnerships

Responsible: partnership expert

Required skills in:

- **Clearly defining the objectives of strategic partnerships:**
 - Identifying specific needs of the CTT that can be addressed through partnerships
 - Establishing the types of benefits desired from partnerships (e.g. access to new markets, financial resources, know-how)
 - Defining the types of desired strategic partnerships (e.g. joint ventures, strategic alliances, licensing agreements, spin-offs)
- **Identification of potential strategic partners:**
 - Using the personal contact networks of the management team members
 - Research of companies, universities and other relevant organizations in the medical field



- Participation in conferences and events in the field
- Monitoring market trends and identifying potential new players
- Using the CTT collaborative platform
- **Preliminary assessment of potential strategic partners:**
 - Analysis of the resources and skills of each potential partner
 - Assessing cultural compatibility and values
 - Estimating the potential for collaboration and mutual benefits

CTT Director:

- **Developing and maintaining relationships with potential partners:**
 - Establishing initial contacts with potential strategic partners
 - Organizing meetings and discussions to present the CTT and collaboration opportunities
 - Maintaining regular communication with potential partners
- **Facilitating collaboration and knowledge exchange:**
 - Identifying areas of mutually beneficial collaboration
 - Organizing joint workshops and seminars
 - Facilitating the exchange of information and know-how between CTT and potential partners

Partnerships with universities:

- **Objectives:**
 - Access to highly qualified human resources (students, teachers)
 - Developing joint research and innovation programs
 - Facilitating technology transfer to industry
 - Increasing the visibility of CTT in academia
- **Activities:**
 - Collaboration agreements for joint research projects
 - Internship programs and scholarships for students
 - Participation in courses and seminars organized by universities
 - Co-organization of conferences and scientific events
- **Benefits:**
 - Access to cutting-edge knowledge and expertise
 - The possibility of developing new innovative products and services
 - Increasing CTT's reputation as a leader in research
 - Stimulating innovation and entrepreneurship

Hospital partnerships:

- **Objectives:**
 - Testing and validating new medical technologies in the clinical environment
 - Access to data and patients for clinical trials
 - Developing customized solutions for the specific needs of hospitals
 - Improving the quality of healthcare provided to patients
- **Activities:**
 - Collaboration agreements for clinical trials



- Implementing innovative IT solutions in hospitals
- Organizing training programs for medical personnel
- Participation in projects to improve the quality of healthcare
- **Benefits:**
 - Accelerating the development and commercialization of new medical technologies
 - Improving patient outcomes
 - Increasing the visibility of CTT in the medical field
 - Strengthening relationships with the medical community

Partnerships with pharmaceutical companies:

- **Objectives:**
 - Development of new drugs and therapies
 - Licensing innovative technologies to pharmaceutical companies
 - Access to financial resources and infrastructure for research
 - Marketing of CTT products and services on a large scale
- **Activities:**
 - Drug discovery collaboration agreements
 - Negotiating licenses for CTT technologies
 - Participation in pharmaceutical industry conferences and events
 - Developing joint marketing and sales strategies
- **Benefits:**
 - Access to significant financial resources for research
 - The possibility of bringing new medicines and therapies to market that can save lives
 - Increasing CTT revenues
 - Strengthening CTT's position as a leader in medical innovation

Partnerships with other relevant institutions:

- **Objectives:**
 - Expanding the CTT's network of collaborators
 - Access to new markets and business opportunities
 - Sharing good practices and experience
 - Promoting innovation in various sectors
- **Activities:**
 - Collaboration agreements with professional associations, government bodies and other relevant institutions
 - Participation in European and international projects
 - Organizing joint events and conferences
 - Exchange of information and resources
- **Benefits:**
 - Increasing the visibility of CTT at national and international level
 - Access to new knowledge and expertise
 - The possibility of influencing policies and strategies in various fields
 - Strengthening CTT's reputation as an innovative and dynamic organization

Conclusion:



Developing strategic partnerships with universities, hospitals, pharmaceutical companies and other relevant institutions can bring significant benefits to CTT.

Activity 3.3.3. Adapting to market trends

Introduction:

The healthcare market is constantly changing, driven by technological advances, new scientific discoveries, and increasingly complex patient needs. To remain relevant and competitive, CTT must quickly adapt to these trends and identify new opportunities to leverage its expertise and resources.

Objectives:

- **Identifying market trends and emerging needs in the medical field.**
- **Developing strategies to adapt to market trends.**
- **Forming strategic partnerships that facilitate adaptation to market trends.**

Responsible: partnership expert

Required skills in:

- **Clearly defining the objectives of strategic partnerships:**
 - Identifying specific needs of the CTT that can be addressed through partnerships
 - Determining the types of benefits desired from partnerships (e.g. access to new markets, financial resources, know-how)
 - Defining the types of desired strategic partnerships (e.g. joint ventures, strategic alliances, licensing agreements, spin-offs)
- **Identification of potential strategic partners:**
 - Using the personal contact networks of the management team members
 - Research of companies, universities and other relevant organizations in the medical field
 - Participation in conferences and events in the field
 - Monitoring market trends and identifying potential new players
 - Using the CTT collaborative platform
- **Preliminary assessment of potential strategic partners:**
 - Analysis of the resources and skills of each potential partner
 - Assessing cultural compatibility and values
 - Estimating the potential for collaboration and mutual benefits

CTT Director:

- **Developing and maintaining relationships with potential partners:**
 - Establishing initial contacts with potential strategic partners
 - Organizing meetings and discussions to present the CTT and collaboration opportunities
 - Maintaining regular communication with potential partners
- **Facilitating collaboration and knowledge exchange:**



- Identifying areas of mutually beneficial collaboration
- Organizing joint workshops and seminars
- Facilitating the exchange of information and know-how between CTT and potential partners

Activities:

- **Monitoring market trends:**
 - Conducting market research and competition analysis.
 - Participation in medical conferences and events.
 - Following specialized publications and news in the field.
- **Identification of emerging needs:**
 - Collaboration with medical professionals (doctors, researchers, patients).
 - Conducting surveys and interviews with potential customers.
 - Analysis of data from the health system.
- **Developing adaptation strategies:**
 - Defining strategic objectives related to adapting to market trends.
 - Identifying the resources and skills needed to implement strategies.
 - Developing concrete action plans.
- **Forming strategic partnerships:**
 - Identifying potential partners who can help adapt to market trends.
 - Developing collaboration agreements with strategic partners.
 - Implementing adaptation strategies in collaboration with strategic partners.

Benefits:

- Increasing the competitiveness of CTT in the medical market.
- Developing new products, services and innovative solutions.
- Improving customer and patient satisfaction.
- Increasing CTT's revenues and profitability.

Market trends:

- Increasing demand for personalized medicine.
- Development of new medical technologies, such as precision medicine, artificial intelligence and robotics.
- The emphasis is on disease prevention and promoting a healthy lifestyle.
- Rising healthcare costs.

Adapting to market trends through strategic partnerships:

- Partnerships with universities and research centers to develop new medical technologies.
- Partnerships with pharmaceutical companies to commercialize new products and therapies.
- Partnerships with hospitals and clinics to implement new IT solutions and improve the quality of healthcare.
- Partnerships with health insurance companies to develop disease prevention programs.



Annex 2 - SWOT analysis on the transition from the One Helix (1H) innovation model to the Four Helix (4H) model within the UMFC D research

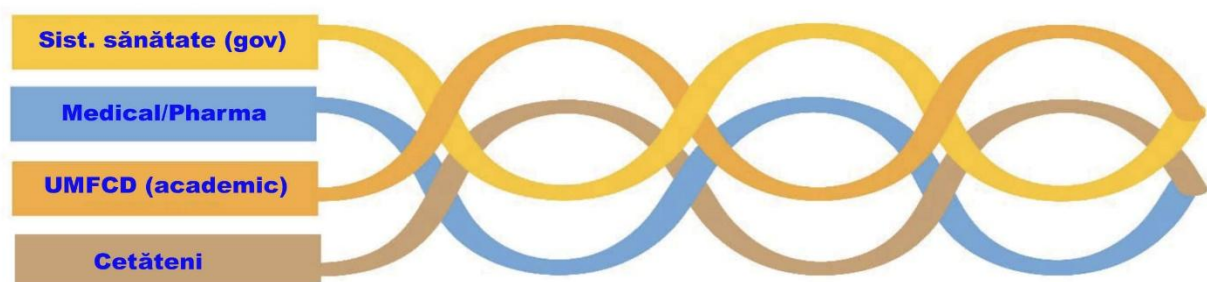
Introduction:

The academic medical field is at a crossroads, with a significant opportunity to shift from a traditional single-helix model of innovation to a more modern and efficient Four Helix model. This shift could lead to accelerated medical progress, better meeting patient needs, and increased societal well-being.

The innovation model with a propeller:

The traditional innovation model with a propeller emphasizes fundamental research carried out in universities and university hospitals. This model is one in which research is carried out at the level of UMFC D or specialized research laboratories, the results being formalized in the form of scientific articles and **validated by other experts in the field through acceptance of publication, citation of works, etc.** Furthermore, by accepting such a status, internationally recognized researchers, through acceptance of publication of articles, citation of articles or other traditional forms, will be satisfied with carrying out fundamental research, with no premise to give up this status built over many years of work.

Four Helix model:



The Four Helix model involves close collaboration between four key sectors:

- **UMFC D – (academic):** Research must have a final result that can be used in practice. Science must therefore be applied and transferred to industry. Validation is much broader, given by principles such as quality, degree of applicability, suitability, use. Researchers have, in this context, a new challenge: to find business partners with whom they can have a useful dialogue, whose needs they can understand and with whom they can make themselves understood. The form of the results must allow for technological transfer.
- **Medical/Pharma:** Pharmaceutical and medical device companies collaborate with universities and teaching hospitals to develop new products, services, and therapies.



- **Public health system:** Governments and public health bodies set research priorities and fund projects that have a significant impact on population health.
- **Citizens:** Patients, citizens and non-governmental organizations express their needs and expectations and are actively involved in the innovation process. Citizens are, moreover, an increasingly active factor in validating/creating new solutions through electronic means. They promote, disseminate and consume innovation much more than they did a few years ago, stimulating or inhibiting the development of new technologies. It can be considered that, with the continuous practice of applied research, adapted to the needs of the state, the visibility of the results among citizens/the public will be increased, bringing, in the long term, in addition to the international visibility of researchers for fundamental research, a regional, local and national recognition among them.

SWOT analysis:

STRONG POINTS:

Accelerating medical progress:

- **Transdisciplinary collaboration:** The Four Helix model facilitates collaboration between experts from diverse fields, such as medicine, engineering, computer science, economics, and management, who can contribute unique perspectives and knowledge to research projects.
- **Shortening the cycle from idea to implementation:** Close collaboration between researchers, industry and authorities can significantly accelerate the process of translating scientific discoveries into new products and therapies.
- **Access to additional resources:** The Four Helix model provides access to financial resources, infrastructure and expertise from various sectors, which allows for the implementation of more complex and ambitious research projects.

Better meeting patients' needs:

- **Patient-centered research:** The Four Helix model emphasizes the involvement of patients and citizens in defining research priorities and evaluating results, ensuring better alignment of innovation efforts with the real needs of patients.
- **Developing personalized solutions:** Collaboration with the medical industry allows for the personalization of therapies and medical devices according to the specific needs of each patient.
- **Improving quality of life:** Medical innovation can lead to a reduction in disease symptoms, an increase in life expectancy, and an overall improvement in the quality of life of patients.



Increasing the well-being of society:

- **Reducing healthcare costs:** Medical innovation can lead to the discovery of new, more effective and less expensive treatments, helping to reduce healthcare spending.
- **Increased productivity:** A healthier population is a more productive population, which can lead to overall economic growth.
- **Improving the health status of the population:** Medical innovation can help reduce the incidence of chronic diseases and improve the overall health status of the population.

Stimulating the economy:

- **Creating new jobs:** The medical industry is an important sector of the economy, creating numerous well-paid jobs in areas such as research, production, marketing, and sales.
- **Increased export revenues:** The development of new products and innovative therapies can lead to increased exports and strengthen the country's position in the global medical products market.
- **Stimulating technological development:** Medical innovation stimulates the development of new technologies in various fields, such as biomaterials, robotics and artificial intelligence, which can also be applied in other sectors of the economy.

WEAK POINTS:

The need for cultural change:

- **Resistance to change:** Some individuals and organizations may be reluctant to change the traditional way of doing things, and persuasion and education efforts may be required to gain their support.
- **Lack of skills:** Some actors involved may lack the skills needed to collaborate effectively with other sectors, such as interdisciplinary communication skills, negotiation and project management.
- **Organizational culture:** The organizational culture of some institutions may be oriented towards hierarchy and control, which can hinder open and transparent collaboration.

Lack of infrastructure:

- **Physical infrastructure:** It may be necessary to build or renovate appropriate physical spaces to facilitate collaboration between different sectors, such as interdisciplinary research centers, shared laboratories, and coworking spaces.
- **IT Infrastructure:** A robust and secure IT infrastructure is required to facilitate data exchange and communication between different sectors.
- **Data management systems:** Effective data management systems may be required to store, analyze, and share research data securely and in compliance with regulations.



Risk of conflicts of interest:

- **Commercial interests:** Private companies may be motivated by profit and may put pressure on researchers to achieve results that favor their commercial interests.
- **Private funding:** Private funding of research can lead to conflicts of interest if private companies have excessive influence over the direction of research.
- **Intellectual property:** Disputes may arise regarding intellectual property over research results, especially when multiple actors from different sectors are involved.

The need for regulation:

- **Lack of legal clarity:** Lack of legal clarity regarding collaboration between the public and private sectors can create uncertainties and discourage collaboration.
- **Incoherent regulation:** Incoherent regulation at national or regional level can create barriers to cross-border collaboration.
- **Overregulation:** Overly strict regulation can bureaucratize collaboration and hinder innovation.

OPPORTUNITIES:

Increasing funding:

- **Government Allocation:** Increasing government allocations for medical research can provide the resources needed to implement the Four Helix model and fund ambitious research projects.
- **Private investment:** Private investment from pharmaceutical companies, venture capital funds, and philanthropists can be attracted by demonstrating the commercial potential of medical research projects.
- **European funding:** European funding programs, such as Horizon Europe, can provide significant opportunities for collaboration and funding for cross-border medical research projects.

Globalization:

- **International collaboration:** Collaborating with universities, companies, and governments in other countries can facilitate access to expertise, resources, and new markets.
- **Knowledge transfer:** Sharing knowledge and experience on implementing the Four Helix model can accelerate progress in countries that are just beginning to adopt this model.
- **Global Innovation:** Global collaboration can lead to medical discoveries and innovations that can benefit the entire world.

New technologies:



- **Artificial Intelligence:** Artificial intelligence can be used to analyze research data, identify new therapeutic targets, and develop new drugs and therapies.
- **Big data:** Big data can provide a more complete picture of diseases and risk factors, facilitating the personalization of treatments and disease prevention.
- **Telemedicine:** Telemedicine can facilitate collaboration between researchers, doctors, and patients in diverse geographic areas.

Raising public awareness:

- **Citizen involvement:** Citizens can be involved in defining medical research priorities, testing new therapies, and promoting medical innovation.
- **Crowdfunding:** Crowdfunding platforms can be used to raise funds for medical research projects that do not benefit from traditional funding.
- **Advocacy:** Non-governmental organizations and patient groups can advocate for policies that support medical research and innovation.

THREATS:

Funding reduction:

- **Political changes:** Political changes can lead to a reduction in the priority given to medical research and a decrease in government funding.
- **Economic crises:** Economic crises can lead to budget cuts in various fields, including medical research.
- **Competition for resources:** There is increasing competition for financial resources from other areas, such as education, infrastructure, and defense.

Failure of collaboration:

- **Communication difficulties:** Communication difficulties between different sectors can lead to misunderstandings, conflicts and ineffective collaboration.
- **Lack of trust:** Lack of trust between different sectors can hinder information sharing and effective collaboration.
- **Differences in objectives:** Different sectors may have different objectives and priorities, which can lead to conflicts of interest and difficulty in finding common ground.

Restrictive regulations:

- **Incoherent regulations:** Incoherent regulations at national or regional level can create barriers to cross-border collaboration.
- **Overregulation:** Overly strict regulation can bureaucratize collaboration and hinder innovation.



- **Lack of legal clarity:** Lack of legal clarity regarding collaboration between the public and private sectors can create uncertainties and discourage collaboration.

Rapid technological changes:

- **The rapid pace of technological development:** The rapid pace of technological development can make the infrastructure and skills required for Four Helix collaboration quickly obsolete.
- **Inequality of access to technology:** Unequal access to technology can create a gap between rich and poor countries in terms of the ability to implement the Four Helix model.
- **Cybersecurity issues:** Increased reliance on technology can increase the risk of cyberattacks and data theft.

Conclusions:

The strengths presented above demonstrate the significant potential of this model to accelerate medical progress, improve the quality of life of patients, contribute to the well-being of society and stimulate the economy. Successful implementation of the Four Helix model as an innovation model will require a concerted effort from all stakeholders, but the potential benefits are significant and worth the effort. The weaknesses found highlight the challenges that need to be overcome to successfully implement this model by implementing effective change management strategies, investing in CTT infrastructure, establishing clear and transparent regulatory frameworks and promoting a culture of collaboration and ethics. The opportunities offered by the external environment presented provide an optimistic framework for implementing the model and, with increasing funding, globalization, new technologies and increasing public/citizen involvement, the Four Helix model has the potential to revolutionize healthcare services and bring significant benefits to society as a whole. The threats from the external environment highlight the risks associated with the implementation of the model and addressing these threats will require careful planning, effective communication and close collaboration between all UMFCDC and CTT research structures, which must ensure a clear and transparent regulatory framework that facilitates collaboration, along with investments in research infrastructure. Adapting to rapid technological changes and addressing cybersecurity issues will also be essential for the long-term success of this model.

CTT's development strategy aims to use strengths, capitalize on opportunities, eliminate threats and mitigate weaknesses of the Four Helix model in the CTT UMFCDC innovation strategy

Vision:

The vision of CTT UMFCDC is to ensure, within a 5-year horizon, the innovative organizational transformation of UMFCDC, to complement the classic missions, to offer educational support and fundamental research with the entrepreneurial mission, certifying



UMFCD as the main coordinating entity of the emerging development of the medical-pharma ecosystem in the Bucharest Ilfov Region, by developing mechanisms that facilitate technological transfer within the framework of knowledge transfer, providing support in the change/development of thinking and entrepreneurial medical or systemic-governmental health actions.

Mission:

The CTT UMFCD mission is derived from the definition and introduction of the entrepreneurial mission of UMFCD, and will consist of **facilitating the valorization of innovation and university research, by promoting technology transfer, developing a high-performance innovation management and increasing the number of new spin-off companies and patents to ensure the sustainability and viability of knowledge transfer.**

CTT UMFCD will strengthen applied research and its relationship with fundamental research through translational mechanisms, to encourage innovation, but also to facilitate the economic development of UMFCD by stimulating innovative services to the community, constituting a factor for increasing UMFCD's innovation and competitiveness.

The purpose of the CTT UMFCD

The purpose of the CTT UMFCD is to define, develop, validate, calibrate and implement the mechanisms through which the new interdisciplinary and research areas at the UMFCD level, dedicated to solving existing problems and challenges, including societal ones, existing in the medical-pharma ecosystem, will ensure the transfer of knowledge from the university to this ecosystem by capitalizing on the results of scientific research obtained within the research structures of UMFCD, by transferring them to the business environment, promoting smart and sustainable development. It thus contributes to increasing the quality and competitiveness of products, processes and services in the health field, to the creation of new jobs and to sustainable economic development in a competitive environment.

Capitalizing on strengths through:

- **Strengthening collaboration:**
 - Facilitate interdisciplinary and intersectoral collaboration between universities, hospitals, pharmaceutical and medical device companies, government agencies, and civil society organizations.
 - Creating online and offline platforms to facilitate information sharing, collaboration and trust building between different sectors.
 - Promoting a culture of collaboration, open communication and transparency.

Taking advantage of opportunities by:

- **Attracting funding:**
 - Developing effective fundraising strategies to attract public and private funding for multi-sectoral medical research projects.
 - Participation in European and international funding programs.
 - Promoting the Four Helix model as an attractive investment for private companies.
- **Facilitating international collaboration:**



- Active participation in international medical research networks.
- Entering into partnership agreements with universities and companies in other countries to facilitate the exchange of knowledge, expertise and resources.
- Promoting cross-border collaboration in medical research projects.
- **Adoption of new technologies:**
 - Investments in digital infrastructure to facilitate online collaboration and access to research data.
 - Promoting the use of artificial intelligence, big data and other advanced technologies to accelerate medical innovation.
 - Developing training programs to train staff in the use of new technologies.

Threat elimination:

- **Developing a clear regulatory framework:**
 - Collaborate with the government to develop a clear and transparent regulatory framework that facilitates collaboration between the public and private sectors in the field of medical research.
 - Ensuring compliance with regulations regarding research ethics and data protection.
 - Promoting equity and access to medical innovation for all patients.
- **Addressing cybersecurity issues:**
 - Implementing cybersecurity strategies to protect research data and prevent cyberattacks.
 - Increasing awareness of cybersecurity risks.
 - Collaborating with cybersecurity experts to develop effective data protection solutions.
- **Adapting to technological changes:**
 - Constant monitoring of developments in the field of medical technology.
 - Adapting Four Helix model implementation strategies to new technologies and trends.
 - Promoting continuous learning and professional development to keep skills up to date.

Mitigating weaknesses by:

- **Implementing change management strategies:**
 - Developing communication and awareness programs to inform and involve all stakeholders in the implementation of the Four Helix model.
 - Addressing resistance to change and concerns related to the Four Helix model.
 - Providing support and resources to facilitate adaptation to the new model.
- **Infrastructure investments:**
 - Modernizing medical research infrastructure, including laboratories, university hospitals, and data centers.
 - Investments in digital infrastructure to facilitate online collaboration and access to research data.
 - Creating physical spaces dedicated to intersectoral collaboration.



- **Promoting a culture of collaboration and ethics is essential to the success of the Four Helix model.**
 - **Instilling values:**
 - Promoting the values of collaboration, transparency, accountability and ethics in all stages of implementing the Four Helix model.
 - Encouraging mutual respect, diversity of opinions and open communication.
 - Ensuring the active involvement of all stakeholders in decision-making.
 - **Development of ethical guidelines:**
 - Developing clear and concise guidelines on medical research ethics, intersectoral collaboration, and managing conflicts of interest.
 - Ensuring compliance with national and international regulations on research ethics.
 - Promoting integrity and accountability in all aspects of implementing the Four Helix model.
 - **Training and education:**
 - Implement training programs to develop the skills needed for interdisciplinary and intersectoral collaboration, including effective communication, problem solving, and decision-making.
 - Raising awareness about the importance of ethics in medical research and intersectoral collaboration.
 - Promoting a culture of continuous learning and professional development to keep skills and knowledge up to date.

Strategic objectives:

- **O.1:** Increase by 10% the number of multisectoral medical research projects by 2028.
- **O.2:** Reduce by 10% the time needed to translate scientific discoveries into new products and therapies by 2026.
- **O.3:** Increase patient satisfaction by 5% through access to innovative medical therapies by 2025.

Key strategies:

- **S.1:** Creation of a UMFCO Working Group for Medical Innovation consisting of representatives from the public, private and civil society sectors to coordinate the implementation of the Four Helix model.
- **S.2:** Development of funding programs dedicated to multisectoral medical research projects.
- **S.3:** Facilitating international collaboration by participating in European research programs and by concluding partnership agreements with universities and companies from other countries.
- **S.4:** Investments in research infrastructure and medical education.
- **S.5:** Implement training programs to develop the skills needed for interdisciplinary collaboration and project management.



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- **S.6:** Promoting a culture of collaboration, ethics and transparency in medical research.
- **S.7:** Develop a clear and transparent regulatory framework that facilitates collaboration between the public and private sectors.
- **S.8:** Implement cybersecurity strategies to protect research data and prevent cyberattacks.
- **S.9:** Periodic monitoring and evaluation of progress to identify challenges and adapt implementation strategies.

Key performance indicators:

- Number of multisectoral medical research projects.
- The time it takes to translate scientific discoveries into new products and therapies.
- Patient satisfaction with access to innovative medical therapies.
- Economic growth generated by medical innovation.

Conclusion:

Implementing the Four Helix model in Romania has the potential to significantly transform the healthcare field and bring significant benefits to society as a whole. The presented strategy provides a clear framework for capitalizing on the strengths, exploiting the opportunities, eliminating the threats and mitigating the weaknesses of this model. Success will depend on close collaboration and concerted effort from all stakeholders involved, including government, universities, companies and civil society organizations.



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