

Neurotech^{EU}

The European University of Brain and Technology



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Executive summary

The European University of Brain and Technology (Neurotech^{EU}) aims to be the backbone of this new vision by bringing together eight leading universities, 250+ partner research institutions, companies, societal stakeholders, cities, and non-governmental organizations to shape education and training for all segments of society and in all regions of Europe.

To ensure the financing of the activities during the implementation period and the sustainability of Neurotech^{EU} beyond the pilot years, partners are committed to a continuous search for top-up funding sources.

In the first part, this document summarizes the actions already taken by the consortium in relation to funding. In the second part, the document outlines future funding opportunities.





1. Short summary of the Neurotech^{EU}

From health & healthcare to learning & education, Neuroscience has a key role in addressing some of the most pressing challenges that we face in Europe today.

Whether the challenge is the translation of fundamental research to advance state of the art in prevention, diagnosis, or treatment of brain disorders or explaining the complex interactions between the brain, individuals, and their environments to design novel practices in cities, schools, hospitals, or companies, brain research is already providing solutions for society at large.

There has never been a branch of study that is as inter-and multi-disciplinary as Neuroscience. From the humanities, social sciences, and law to natural sciences, engineering, and mathematics, all traditional disciplines in modern universities have an interest in brain and behaviour as a subject matter. Neuroscience has a great promise to become an applied science, to provide brain-centred or brain-inspired solutions that could benefit the society and kindle a new economy in Europe. The European University of Brain and Technology (Neurotech^{EU}) aims to be the backbone of this new vision by bringing together eight leading universities, 250+ partner research institutions, companies, societal stakeholders, cities, and non-governmental organizations to shape education and training for all segments of society and in all regions of Europe.

Innovation and societal impact will be instilled as integral parts of education and training. Upon extensive consultation, including with 3500+ students, 200+ researchers, companies, and societal stakeholders, we have identified eight challenges that advancements in Neuroscience and Neurotechnology can help to solve problems facing the society in:

- (1) health & healthcare,
- (2) learning & education,
- (3) nutrition & cognition,
- (4) biological & artificial intelligence,
- (5) neurotechnology & big data,
- (6) public & ethics,
- (7) economy & ecology, and
- (8) smart cities.

We will coordinate our education and innovation efforts mainly, but not exclusively in these domains to ensure education, research, innovation, and societal impact collectively shape our joint efforts.

To ensure the financing of the activities during the implementation period and the sustainability of Neurotech^{EU} beyond the pilot years, partners are committed to a continuous search for top-up funding sources. The reports on the mapping of the funding opportunities will:

- summarize the proposals the Alliance applied for jointly and
- support the partners of the Alliance in the planning of their joint activities; in the strengthening of their multi-, and interdisciplinary cooperation among each other and with the Associated Partners; and by the financial stability the active participation of the students, researchers, associated partners, innovators, scholars, and the administrative staff is ensured.

Not only the development of mobility and pedagogies, international cooperation, summer and winter schools, consortia funding, RISE exchange programme, other Erasmus+ funding programmes (e.g., Knowledge Alliance), Lifelong Learning activities can be in the interest of the consortia, but joint research and innovation projects and newly identified opportunities, too. All these resources will be used solely for the continuation of the European University of Brain and Technology.





This document is to be presented to the Board of Governors for general distribution and involvement of the relevant actors and for action planning.

A copy will be made available on the Neurotech^{EU} portal.

2. Actions taken by the partnership

Title of the proposal	Call	Participants from the Neurotech ^{EU} Alliance	Application deadline
Universities of the Future (FUTURIST)	COST Action	18 countries (7/8 Neurotech ^{EU} ones)	Nov 13 2020
CoLEARN	Erasmus+ Digital Education Readiness	BOUN RU UBO	Oct 29 2020
Digital Research, Education and Applied training Medium (DREAM)	Erasmus+ Digital Education Readiness	RU UMH UBO BOUN UMF	Oct 29 2020
Neurotech Research and Innovation (Neurotech^{RI})	H2020-IBA-SwafS-Support-2-2020 (Support for the Research and Innovation Dimension of European Universities	All	Nov 10 2020

2.1. Universities of the Future (FUTURIST)

The ongoing pandemic has accelerated the evolution of universities. As universities rushed to transfer their teaching and training online, research and innovation activities had to be temporarily put on hold in many academic fields while scientists devised creative solutions to continue their research. Even though the educational content continues to be successfully transferred to the world wide web, novel pedagogical approaches are yet to be developed to reach all learning objectives in an online world. The emergence of novel online education platforms (including virtual classrooms in augmented reality), new forms of degree (certification) programs, and new global actors that provide specialized education (Google, Apple, Facebook, and others) contribute to a rapidly changing education ecosystem and necessitate an expeditious look into the transformation of our universities. A systematic approach to rethinking the educational, research, and innovation roles of higher education institutions in this new era will help ensure that universities will continue to serve the “Knowledge Square”.

FUTURIST will address this challenge by bringing together experts throughout Europe. The network will organize meetings, annual summits, training schools, and short-term scientific missions to establish a ThinkTank called UNINEXT and develop an actionable road-map for the Universities of the Future. The road-map will cover 10 routes, i.e., Access, Content, Pedagogy, Quality, Recognition, Research, Strategy, Technology, and Leadership for “People, Process and Product” required for the (digital) transformation of universities.





FUTURIST already has representation from 18 European countries: Croatia, Cyprus, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, the Netherlands, Poland, Portugal, Romania, Slovakia, Spain, Turkey, and the United Kingdom. 45 experts, researchers, educators, and innovators from 40 institutions form a gender-balanced and diverse network. The expertise of the network includes Educational Sciences (~17%), Medicine (~14%), Biological Sciences (~12%), Economics and Business (~12%), Civil, Environmental, Medical Engineering (~10%), Computer Sciences and Information Engineering (~10%) and many branches of arts and humanities (collectively ~ 20%).

FUTURIST's actions and UNINEXT's missions will create synergy with and support the ongoing European initiatives, including European Universities, the establishment of the European Education Area by 2025, and the next chapter of the European Research Area. It will explicitly integrate the European Enablers, e.g., the European Student Card, European Qualification Framework, into the road-map to imagine the future universities as education, research, and innovation powerhouses in a digital and a connected world.

The project is a COST Action - <https://www.cost.eu/>, submitted by Nov 13 2020.

2.2. CoLEARN

The COVID-19 global pandemic has dramatically changed and created significant challenges for higher education. Most notably, higher education faculty members were expected to transition their face-to-face classes to a remote/online modality almost overnight. This urgency highlighted the need for faculty to develop a more sophisticated set of digital competencies to adapt to the changing demands of teaching at the universities. The typical/traditional approach to support faculty members in developing such digital competencies has been with training programs focusing primarily on developing technological skills or sharing digital resources created by experts. While such means of professional support are essential, they are not sufficient for developing advanced levels of digital competencies outlined by the EU's digital competence for educators (DigCompEdu) framework. It is necessary to have educators work on significant design problems and provide appropriate technological and pedagogical scaffolding to support their continuous professional development, especially given the rapidly changing nature of digital technologies (Koehler, Mishra, & Yahya; 2007; Putnam & Borko, 2000).

Professional learning communities, which afford the co-construction of professional knowledge, are considered very important for professional development and growth (Stoll & Louis, 2007). Online collaborative learning communities allow educators to focus on mutually significant professional problems and develop collaborative solutions irrespective of location and physical distance (Schlager & Fusco, 2003). More specifically, collaborative professional spaces can facilitate developing adaptive responses to the emerging educational needs in the COVID-19 and post-COVID era and developing digital competencies as a by-product of collaboration. However, it is essential to provide the necessary technological and pedagogical support to faculty to establish and sustain such collaborative communities. The primary purpose of this project is to develop higher education faculty's digital competencies by supporting the collaborative design of online courses (or course modules) utilizing and testing the DREAM digital environment.

The project brings together three of the founding universities of Neurotech^{EU}, Bogazici University (CoLEARN; lead applicant), Radboud University (Beneficiary), and the University of Bonn (Beneficiary). The partners will recruit faculty as participants in their universities, inviting a range of disciplines. The project team will design and utilize the pedagogical and technological support necessary to create and sustain collaboration among faculty for collaborative course design and establishing professional networks. The pedagogical support will be based on the EU DigCompEdu digital competence framework. The technological space that will allow collaboration and course management will be implemented as part of the digital university infrastructure of the Neurotech^{EU}. The courses jointly created by the faculty will be offered to their students, whose learning is the ultimate goal for all



educational projects. All the digital resources and course materials will become open educational resources at the end of the project and be translated into local languages for broader impact.

After the test case of an integrated platform for collaboration, course design, and management, this project may open up new possibilities for offering joint classes or degrees among universities. Once cooperation agreements are made, as suggested by the European Commission, universities may begin to co-design whole study programs whose coursework is distributed across different nations' HEIs.

The proposal was submitted to the Erasmus+ Digital Education Readiness Call on Oct 29, 2020.

2.3. Digital Research, Education and Applied training Medium (DREAM)

DREAM will deliver a free, open-source digital university infrastructure to facilitate multi-disciplinary intersectoral transborder education and research cooperation between partners all over the world. We will provide the necessary training to learners and teachers to maximally benefit from the platform and provide 3 micro-modules that will serve as a creative example of use-case scenarios for the DREAM platform. These goals will be achieved under strict quality control measures, which will also offer standardized guidelines for digital teaching and education. The platform can be used to support traditional as well as emerging forms of education, thus enlarging their scope (e.g., blended mobility), and offers the opportunity to fully switch to online education. DREAM platform will be free for all education institutes of all levels thus, the impact of this proposal won't be limited to higher education institutions. To test the DREAM, we will develop instructional materials, certification programs (for teachers), and micro-modules which will be made available to anyone online for free. Future modules that will be provided by Neurotech^{EU} will be distributed on this DREAM platform which will ensure its sustainability.

DREAM will offer an integrated solution for educational portal development and management, time management, casting and streaming, teleconferencing, learning management, and creation of collaboration spaces, including data storage possibilities meeting GDPR requirements for transborder education, research, and innovation (open academic environment). Such a platform does not yet exist. Currently, digital platforms used for online teaching are limited to Brightspace, Blackboard (both of which require subscription fees, therefore generally offered only by universities); Moodle and Apereo are capable free alternatives, however, with limited functionality. Other general online video chat platforms like Google Meet, Google Classroom, Zoom, and Microsoft Teams are used to deliver lectures and organize educational efforts, but they do not offer commonly used functions by educational users. Therefore an open-source, free, flexible, modular, and a scalable platform, like the DREAM, would have a transformative impact on the digitalization of universities.

The DREAM consortium consists of 5 HEI's which already cooperate within a successful European University Alliance, European University of Brain and Technology (Neurotech^{EU}): Radboud University (NL), Miguel Hernandez University of Elche (ES), University of Bonn (DE), Bogazici University (TR), and Iuliu Hațieganu University of Medicine and Pharmacy (RO). Due to budgetary restrictions, not all 8 founding universities and 21 partnering universities have been included in this proposal as beneficiaries. However, the Neurotech^{EU} will be actively participating as an Alliance. This partnership represents all corners of Europe (in the geographical sense) which will ensure widespread dissemination of project outcomes across Europe and guarantees an intercultural approach. Together we cover a broad range of expertise necessary to successfully execute the proposed activities. All partners will contribute to the project in the field of course development, training, recognition, and quality assessment, as well as in designing the use case scenarios for the DREAM platform and testing it. In the testing phase, both teachers and students will use and evaluate the developed micro-modules and instruction materials (guidelines, handbooks, instruction videos). The partners will strive for recognition of the micro-modules,



including through the European Recognition of (professional) Qualifications, and actively share their experiences, including good practices.

The proposal was submitted to the Erasmus+ Digital Education Readiness Call on Oct 29, 2020.

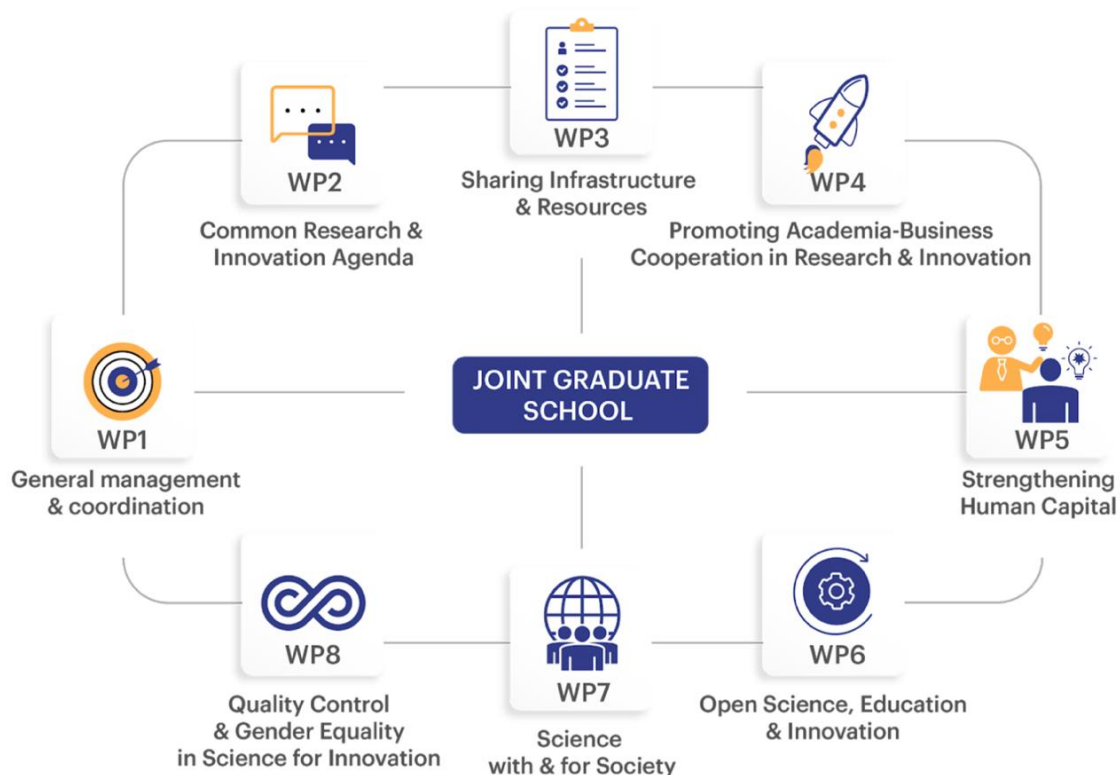
2.4. Neurotech Research and Innovation (Neurotech^{RI})

Neurotech^{RI} will develop an actionable strategy and a sustainable plan for multi-institutional research, development, and innovation. We propose a test-bed for implementation and measurable impact.

Neuroscience has a great promise to become an applied science, to provide brain-centred or brain-inspired technologies and products that could benefit the masses and kindle a new economy in Europe. Neurotech^{RI}, an initiative of the founding universities of the European University of Brain and Technology (Neurotech^{EU}), aims to be the backbone of this new vision by developing an actionable, integrated, and long-term joint strategy for research and innovation. The two initiatives, Neurotech^{EU} and Neurotech^{RI}, collectively offer a transformative framework for education, research, and innovation by network universities and the universities of the future.

By bringing together eight leading universities across the four corners of Europe, 30+ cross-sectoral associates in Neurotech^{RI} and 250+ in Neurotech^{EU} and working together in a structured way, we aim to transform cooperation in research and innovation across the Alliance, establish, coordinate and support joint initiatives and empower researchers across borders, disciplines, and sectors. Pushing the boundaries of fundamental research and applied science will mobilize innovation ecosystems, including the Neurotech^{EU} ecosystem we are forming, while engaging active citizens to transform how we innovate, educate and impact the society at large.

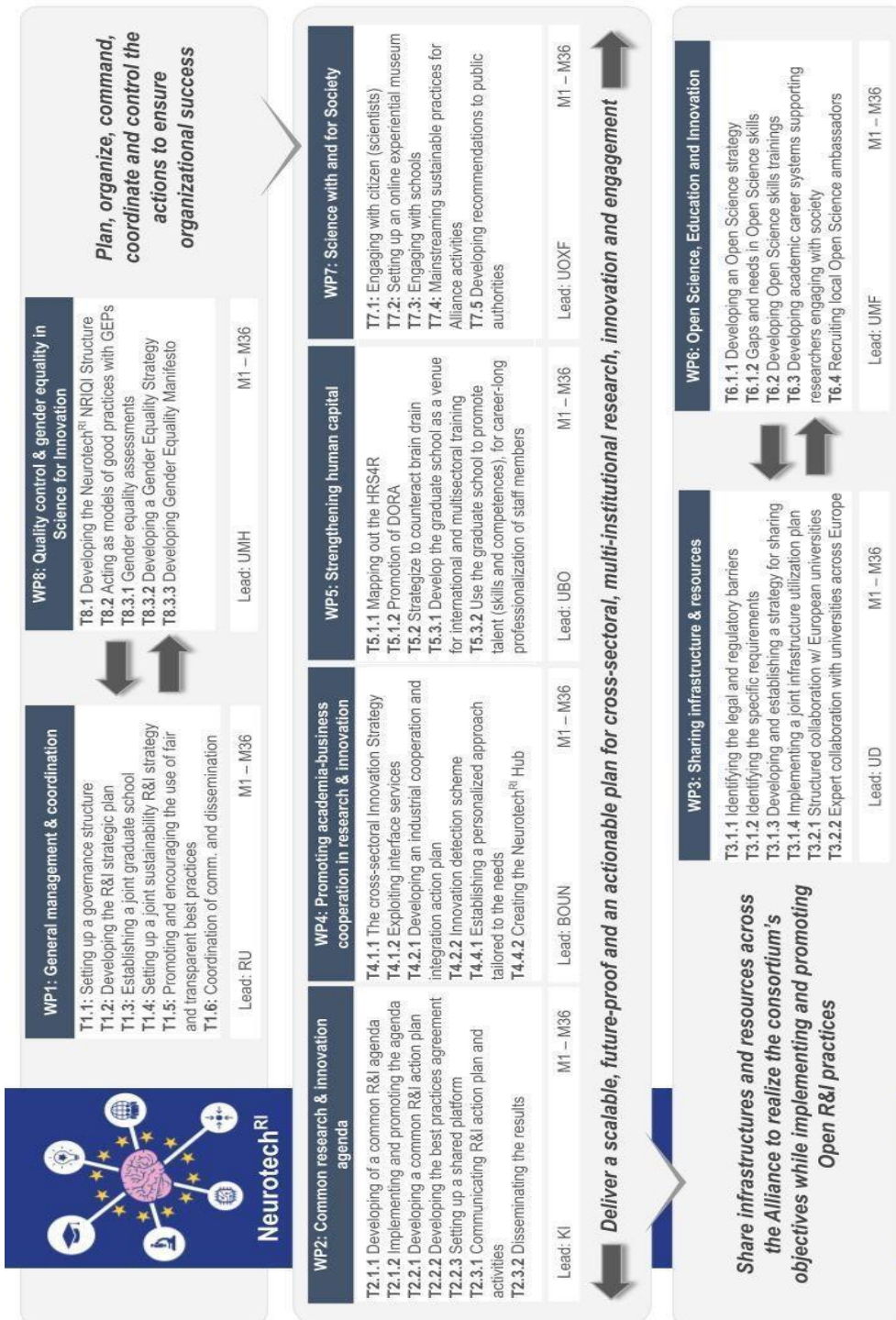
The proposal was submitted to the call H2020-IBA-SwafS-Support-2-2020 (Support for the Research and Innovation Dimension of European Universities (Part II)) on Nov 10 2020.



Neurotech^{RI} work packages (WP). The strategy and action plan that will be developed across the 8 WPs will be tested via a joint graduate school. This approach will ensure that integrated research and innovation activities can be started without delay while the graduate school can be used as a test-bed for implementation and iterative improvement of the joint strategy and action plan. The tasks of each WP and the interaction between WPs are shown on the PERT chart on the next page.

3. Target programs of the future

Application deadlines in 2021



Program name	Focus	Application deadline	Budget
Erasmus Mundus Joint Master Degrees – Erasmus+	Joint educational programs at the Masters level	End of Feb (exp)	4.8M
ERA-NET	2021 „Neurodevelopmental Disorders”	9 March	Normally 5M EUR, but no min. or max.
Knowledge Alliance	Cooperation between academy and industry	May 1 (exp)	1M
MSCA Staff exchanges	Exchange of staff for international and interdisciplinary projects	Sep 22	3M
COFUND	Joint educational and training programs	Oct 6 (to be confirmed)	Up to 10M
COST Action	Creation of research networks	Oct 29	Typically 600K for a 4 year project with ~20 participants

3.1. Erasmus Mundus Joint Master Degrees – Erasmus+

An Erasmus Mundus Joint Master Degree (EMJMD) is a prestigious, integrated, international study programme, jointly delivered by an international consortium of higher education institutions (HEIs) and, where relevant, other partners with specific expertise and interest in the study programme. EMJMDs aim to:

- Foster excellence, innovation, and internationalisation in HEIs
- Boost the attractiveness of the European Higher Education Area (EHEA) and support the EU's external action in the field of higher education
- Improve the level of competencies and skills of Master graduates and their employability

All participating HEIs established in a Programme Country must be institutions that award the corresponding EMJMD Master's degree, either joint or multiple/double. The degrees must be accredited, where applicable, by the competent national authorities in the countries where the HEIs are established.

Information is from:

https://ec.europa.eu/programmes/erasmus-plus/opportunities/individuals/students/erasmus-mundus-joint-master-degrees_en

Call opening and deadline: the call is not open yet; the deadline is expected to be at the **end of February**.

Funding available: An EMJMD is a study programme of 60, 90, or 120 ECTS credits. This means that it lasts from a minimum of 12 months to a maximum of 24 months. The maximum funding is EUR 4.8 million.

3.2. ERA-NET 2021 Neurodevelopmental disorders

Neurological and mental disorders impose a high societal and economic burden on the European population, leading to costs of more than 800 billion euros per year. A wide range of brain disorders already manifests during development in early life. Such neurodevelopmental disorders severely curtail the quality of life of patients and their families, often throughout their entire lifespan. Thus, neuroscientific





research on neurodevelopmental disorders and their translation into diagnostic and therapeutic outcomes is a central pillar to promote healthy living in Europe and worldwide.

To address this topic, the 'Network of European Funding for Neuroscience Research' (NEURON) aims to coordinate research efforts and funding programmes across Europe and beyond to promote disease-related biomedical research on neurodevelopmental disorders. NEURON particularly wishes to encourage multidisciplinary approaches and translational research proposals combining basic and clinical research that will ultimately help to develop new strategies for prevention, diagnosis, therapy, and rehabilitation. With this aim, 22 funding organisations from 20 countries launched a Joint Transnational Call for Research Proposals on 'Neurodevelopmental Disorders'.

Information is from: <https://www.neuron-eranet.eu/en/972.php>

Call opening and deadline: Mar 9 2021, 14:00 CET

Funding available: Normally 5M EUR, although there is no minimum or maximum funding, but the reimbursement rate is maximum 33% of the total eligible costs.

3.3. Knowledge Alliance - Erasmus+

Knowledge alliances are transnational and result-driven activities between higher education institutions and businesses.

Knowledge Alliances target cooperation between organisations established in Programme Countries. Organisations from Partner Countries may also participate as partners (not as applicants) if they bring an essential added value to the project. The projects are open to any discipline, sector, and cross-sectoral cooperation.

Knowledge Alliances aim at strengthening Europe's innovation capacity and at fostering innovation in higher education and business.

Information is from:

https://eacea.ec.europa.eu/erasmus-plus/actions/key-action-2-cooperation-for-innovation-and-exchange-good-practices/knowledge-alliances_en

Call opening and deadline: the call has not been announced yet. However, we expect the deadline to be on **May 1**.

Funding available: Maximum EU contribution awarded for a 3-year Knowledge Alliance is 1M EUR.

3.4. MSCA Staff Exchanges - Horizon Europe

The MSCA funds short-term exchanges of personnel between academic, industrial, and commercial organisations throughout the world.

It helps people develop their knowledge, skills, and careers while building links between organisations working in different sectors of the economy, including universities, research institutes, and SMEs.

Difference with Horizon2020: secondments will need to be international and interdisciplinary and will not necessarily require a company.

Call opening and deadline: the call opens on Apr 15, and the deadline will be on **Sep 22**.





Funding available: The maximum contribution is EUR 3 million for a project's duration of up to 4 years, including:

- EUR 2100 per staff to cover the expenses (living, travel expenses),
- EUR 1800 per month per person for research networking costs,
- EUR 700 per person per month budget for management costs.

3.5. COFUND - Horizon Europe

Co-funding of regional, national and international programmes (COFUND) scheme aims to stimulate regional, national, or international programmes to foster excellence in researchers' training, mobility, and career development, spreading the best practices of the Marie Skłodowska-Curie actions.

This will be achieved by co-funding new or existing regional, national, and international programmes to open up to, and provide for, international, intersectoral, and interdisciplinary research training, as well as transnational and cross-sectoral mobility of researchers at all stages of their careers.

Information is from:

https://ec.europa.eu/research/mariecurieactions/actions/co-funding-programmes_en

Call opening and deadline: the deadline will be on Oct 6 (to be confirmed)

Funding available: the maximum contribution is EUR 10 million for a project's duration of up to 5 years.

3.6. COST Action

The European Cooperation in Science and Technology (COST) is a funding organisation for the creation of research networks called COST Actions. These networks offer an open space for collaboration among scientists across Europe (and beyond) and thereby give impetus to research advancements and innovation.

COST is bottom-up, this means that researchers can create a network – based on their own research interests and ideas – by submitting a proposal to the COST Open Call. The proposal can be in any science field. COST Actions are highly interdisciplinary and open. It is possible to join ongoing Actions, which therefore keep expanding over the funding period of four years. They are multi-stakeholders, often involving the private sector, policymakers as well as civil society.

Information is from: <https://www.cost.eu/who-we-are/about-cost/>

Call opening and deadline: the call is already open, the deadline will be on Oct 29.

Funding available: typical contribution is EUR 600 000 for a project duration of up to 4 years.

Other relevant programs in planning

3.7. Digital Europe Programme

Digital Europe aims to trigger investments by the EU, the Member States, and industry in the key areas of artificial intelligence, advanced computing and data handling, cybersecurity, and the advanced digital skills necessary to deploy them. The programme has the potential to connect businesses, public administrations, and citizens to the latest technologies and resources. It will also help Europe to remain globally competitive and strategically autonomous and to have a say in how new technologies reflect our needs and values.





The Digital Europe programme is structured around two main types of activities: A) Building essential digital capacities for the three key digital technology areas identified (HPC, AI, and cybersecurity) as well as the advanced digital skills needed to “operate” them, and B) accelerating the adoption and best use of digital technologies, including the latest digital capacities, across the economy and society.

Information is from:

<https://ec.europa.eu/digital-single-market/en/europe-investing-digital-digital-europe-programme>

Call opening and deadline: TBA

Funding available: the programme overall budget is EUR 7.5 billion.

3.8. Erasmus+ Strategic Partnerships

Strategic Partnerships are transnational projects designed to develop and share innovative practices and promote cooperation, peer learning, and exchanges of experiences in the fields of education, training, and youth.

Overall, strategic partnerships aim to address horizontal priorities as well as field-specific priorities in the areas of: Higher education, Vocational education and training, School education, Adult education, and Youth.

There are two kinds of Strategic Partnership; those supporting innovation and those supporting the exchange of good practices.

Information is from:

https://ec.europa.eu/programmes/erasmus-plus/opportunities/strategic-partnerships-field-education-training-and-youth_en

Call opening and deadline: TBA

Funding available: Grants for projects are generally capped at € 150,000 per year.

3.9. Horizon Europe – All Pillars

The main work program is planned to be adopted in April 2021.

Information is from: https://ec.europa.eu/info/horizon-europe_en





4. Interesting information from partners of the Neurotech^{EU}

Neurotech^{EU} brings together 170,000 students and 70,000 staff from the four geographical regions of Europe. The founding partners of Neurotech^{EU} have a long tradition of university-wide cooperation, as evidenced by student and staff exchange, joint grant applications, and collaborative research projects, resulting in joint publications.

We are sure that it is useful; therefore, we are ready to track the development of the partners' cooperation and development in the fields covered by the Neurotech^{EU}.

Nevertheless, we must also keep partners informed about the projects any of the partners are implementing and which are connected to the Neurotech^{EU} objectives. In this report 3 partners present their current projects connecting to the topics of the Neurotech^{EU}.

4.1. UMH

4.1.1. Implementation of Consumer NEUROscience and SMART Research Solutions in AromachOLOGY (NEUROSMARTOLOGY)

The project of the 7 partners coordinated by the Slovak University of Agriculture in Nitra (Slovakia) searches for the answers to the question 'What aroma marketing can do?'

<http://www.fem.uniag.sk/sk/neurosmartology/>

4.1.2. Brain-wide functional connectivity of oxytocin neurons

The project has not yet started.

<https://fbial.yggycloud.com/archivesearch.aspx?base=fbial&search=TI:%222250%20-%20Brain-wide%20functional%20connectivity%20of%20oxytocin%20neurons%22&format=athena#>

4.1.3. Systems biology of alcohol addiction: modelling and validating disease state networks in human and animal brains. SyBil-AA

Alcohol addiction ranks among the primary global causes of preventable death and disabilities in the human population, but treatment options are very limited. Rational strategies for the design and development of novel, evidence-based therapies for alcohol addiction are still missing. Within this project, we will utilize a translational approach based on clinical studies and animal experiments to fill this gap. We will provide a novel discovery strategy based on systems biology concepts that use mathematical and theoretical network models to identify brain sites and functional networks that can be targeted specifically by therapeutic interventions.

The project was finished on Dec 31, 2019.

<https://cordis.europa.eu/project/id/668863>

4.2. UBO

4.2.1. Clinical trial readiness for SCA1 and SCA3

Seeking answers to a currently incurable disease like spinocerebellar ataxia (SCA) is a challenging effort, but Houston Methodist is leading the way in studying this rare, inherited neurodegenerative disease. With no specific treatment for SCA, this five-year clinical trial readiness grant will establish the world's largest study participant group so that researchers can collect enough clinical, imaging, and





biochemical data to design full-scale clinical trials that generate conclusive results on effective treatments. The implications of this readiness study are significant, given that there has been only one pharmaceutical treatment option approved in the last 25 years for ataxia.

UBO is one of the 71 institutions coordinated by Houston Methodist around the globe.

<https://readisca.org/>

4.3. UD

4.3.1. Genomic Instability of Expanded Repeats in HD and ALS/FTD. (N° ERARE18-066: REPETOMICS)

In this project, the partners are working with the coordination of the Cancer Research Centre of Marseille (CRCM) on the research of Huntington's Disease (HD) and certain forms of amyotrophic lateral sclerosis and dementia (ALS/FTD), which are inherited. Their genetic root cause is the expansion of short, repeated stretches of DNA, namely CAG in the huntingtin gene for HD and GGGGCC (G4C2) repeats in the C9orf72 gene for ALS/FTD. These inherited expansions continue to expand during life, fueling disease manifestation and progression. The project aims:

- (1) to measure the size of the expansion accurately at the level of single cells, contrasting affected and unaffected parts of the body and the brain,
- (2) to identify at what time points in life and in which cells these expansions take place,
- (3) to understand how expansion comes about and through what cellular machinery the size of the expansion is modified,
- (4) to understand what consequences a change in repeat size has for a cell by looking in an unbiased fashion at alterations of gene expression and at gene mutations, and
- (5) to demonstrate the impact of interfering with repeat sizes.

These studies will be carried out in model systems such as mice and yeast genetically altered in such a way that the genetic change at the root of the human disorder is mimicked as good as feasible and then validated in cells derived from patients affected by the respective disorders as well brain tissues donated by patients. Ultimately, suppression of expansion should be beneficial for patients by slowing progression; reductions in expansion size could even be curative. To achieve these ambitious goals, we have brought together European and Canadian leaders in the field. From the Neurotech^{EU} partnership, the University of Oxford is also a partner.

<http://www.erare.eu/financed-projects/repetomics>

4.3.2. MICROBiome-based biomarkers to PREDICT decompensation of liver cirrhosis and treatment response

Together with the University of Bonn, with the coordination of the European Foundation for the study of chronic liver failure (EF CLIF), 22 European institutions joined forces in MICROB-PREDICT to improve the prevention and treatment of chronic liver disease (cirrhosis). The partnership aims to identify microbiome-based biomarkers and mechanisms that predict in advance when the body can no longer compensate for the dysfunctional liver (decompensated cirrhosis), when such decompensated cirrhosis will progress to acute-on-chronic liver failure (ACLF), and a patient's individual treatment response. Based on such biomarkers, they strive to develop novel diagnostic tools for earlier and better patient stratification and to establish personalised and effective treatment strategies.

<https://microb-predict.eu/>

