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HORIZON 2020. Структурований конспект

Horizon 2020 addresses researchers from universities, research organisations, enterprises, international special interest organisations and other legal entities of the EU Member States and the Associated States of the Framework Programme. Institutions from third countries are principally entitled to participate. Small and medium-sized enterprises (SMEs) have access to their own fast funding mechanisms in order to tap their specifically high innovation potential.

Horizon 2020 consist of three priorities, namely:

'Excellent Science'	**'Industrial Leadership'**	**'Societal Challenges'**
covering support for curiosity-driven blue sky research - i.e. European Research Council (ERC) and Future Emerging Technologies (FET), research infrastructures as well as research careers and mobility through Marie Skłodowska-Curie Actions (MSCA);	providing support to industry and Small- and Medium Sized Enterprises (SME) in research and innovation activities, including instruments to foster development of enabling technologies as well as financial instruments (incorporating some parts of the former Competitiveness and Innovation Programme);	supporting collaborative research projects that address seven specific societal challenges.

1.Excellent science:

1.1 GRANTS OF THE EUROPEAN RESEARCH COUNCIL (ERC) TO SUPPORT FRONTIER RESEARCH

Starting Grant - support up-and-coming research leaders who are about to establish a proper research team and to start conducting independent research in Europe. The scheme targets promising researchers who have the proven potential of becoming independent research leaders. It will support the creation of excellent new research teams. For researchers of any nationality with 2-7 years of experience since completion of PhD (or equivalent degree) and scientific track record showing great promise.

Consolidator Grant - support researchers at the stage at which they are consolidating their own independent research team or programme. The scheme will strengthen independent and excellent new individual research teams that have been recently created. For researchers of any nationality with 7-12 years of experience since completion of PhD (or equivalent degree) and scientific track record showing great promise.

Advanced Grant – for exceptional established research leaders of any nationality and any age to pursue ground-breaking, high-risk projects that open new directions in their respective research fields or other domains. The ERC Advanced Grant funding targets researchers who have already established themselves as independent research leaders in their own right.

Proof of Concept Grant - open to researchers who have already been awarded an ERC grant. ERC grant holders can apply for this additional funding to establish the innovation potential of ideas arising from their ERC-funded frontier research projects.

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<u>Synergy grant</u> - to enable a small group of researchers and their teams to bring together complementary skills, knowledge, and resources in new ways, in order to jointly address a research problem.

The panels of each grant are grouped into three disciplinary domains that cover the entire spectrum of science, engineering and scholarship:

1. Social sciences and Humanities (SH)
2. Life sciences (LS)
3. Physical and Engineering Sciences (PE)

Domains and panels

Domain PE: <u>Physical Sciences</u> & Engineering

PE1 Mathematical foundations: all areas of mathematics, pure and applied, plus mathematical foundations of computer science, mathematical physics and statistics

PE2 Fundamental constituents of matter: particle, nuclear, plasma, atomic, molecular, gas, and optical physics

PE3 Condensed matter physics: structure, electronic properties, fluids, nanosciences

PE4 Physical and analytical chemical sciences: analytical chemistry, chemical theory, physical chemistry/chemical physics

PE5 Materials and synthesis: materials synthesis, structure-properties relations, functional and advanced materials, molecular architecture, organic chemistry

PE6 Computer science and informatics: informatics and information systems, computer science, scientific computing, intelligent systems

PE7 Systems and communication engineering: electronic, communication, optical and systems engineering

PE8 Products and processes engineering: product design, process design and control, construction methods, civil engineering, energy systems, material engineering

PE9 Universe sciences: astro-physics/chemistry/biology; solar system; stellar, galactic and extragalactic astronomy, planetary systems, cosmology, space science, instrumentation

PE10 Earth system science: physical geography,

Domain SH: <u>Social Sciences</u> & <u>Humanities</u>

SH1 Individuals, institutions and markets: economics, finance and management

SH2 Institutions, values and beliefs and behaviour: sociology, social anthropology, political science, law, communication, social studies of science and technology

SH3 Environment and society: environmental studies, demography, social geography, urban and regional studies

SH4 The Human Mind and its complexity: cognition, psychology, linguistics, philosophy and education

SH5 Cultures and cultural production: literature, visual and performing arts, music, cultural and comparative studies

SH6 The study of the human past: archaeology, history and memory.

Domain LS: <u>Life Sciences</u>

LS1 Molecular and Structural Biology and Biochemistry: molecular biology, biochemistry, biophysics, structural biology, biochemistry of signal transduction

LS2 Genetics, Genomics, Bioinformatics and Systems Biology: genetics, population genetics, molecular genetics, genomics, transcriptomics, proteomics, metabolomics, bioinformatics, computational biology, biostatistics, biological modelling and simulation, systems biology, genetic epidemiology

LS3 Cellular and Developmental Biology: cell biology, cell physiology, signal transduction, organogenesis, developmental genetics, pattern formation in plants and animals

LS4 Physiology, Pathophysiology and Endocrinology: organ physiology, pathophysiology, endocrinology, metabolism, ageing, regeneration, tumorigenesis, cardiovascular disease, metabolic syndrome

LS5 Neurosciences and neural disorders: neurobiology, neuroanatomy, neurophysiology, neurochemistry, neuropharmacology, neuroimaging, systems neuroscience, neurological disorders, psychiatry

LS6 Immunity and infection: immunobiology, aetiology of immune disorders, microbiology, virology, parasitology, global and other infectious diseases, population dynamics of infectious diseases, veterinary medicine

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geology, geophysics, meteorology, oceanography, climatology, ecology, global environmental change, biogeochemical cycles, natural resources management.		**LS7** Diagnostic tools, therapies and public health: aetiology, diagnosis and treatment of disease, public health, epidemiology, pharmacology, clinical medicine, regenerative medicine, medical ethics **LS8** Evolutionary, population and environmental biology: evolution, ecology, animal behaviour, population biology, biodiversity, biogeography, marine biology, ecotoxicology, prokaryotic biology **LS9** Applied life sciences and biotechnology: agricultural, animal, fishery, forestry and food sciences; biotechnology, chemical biology, genetic engineering, synthetic biology, industrial biosciences; environmental biotechnology and remediation.

http://erc.europa.eu/

1.2 MARIE SKŁODOWSKA-CURIE ACTIONS

aims **to support mobility of researchers** at different stages of their career. MSCA are open to all domains of research and innovation, from basic research to market take-up and innovation services.

4 funding schemes:

- **Individual Fellowships (IF)**
Individual Fellowships will support the mobility of researchers within and beyond Europe - as well as helping to attract the best foreign researchers to work in the EU. The grant usually covers two years' salary, a mobility allowance, research costs and overheads for the host institution. Individual researchers submit proposals for funding in liaison with their planned host organisation. Proposals are judged on their research quality, the researcher's future career prospects, and the support offered by the host organisation. Fellows can also spend part of the fellowship elsewhere in Europe if this would boost impact, and those restarting their career in Europe benefit from special eligibility conditions.
- **Innovation Training Networks (ITN)**
ITNs support competitively selected joint research training and/or doctoral programmes, implemented by European partnerships of universities, research institutions, and non-academic organisations.
The research training programmes provide experience outside academia, hence developing innovation and employability skills. ITNs will include industrial doctorates, in which non-academic organisations have an equal role to universities in respect of the researcher's time and supervision, and joint doctoral degrees delivered by several universities. Furthermore, non-European organisations can participate as additional partners in ITNs, enabling doctoral-level candidates to gain experience outside Europe during their training.
- **Cofunding of existing or new PhD and postdoc fellowship programmes (COFUND)**
The MSCA offer additional 40% funding to regional, national and international programmes for research training and career development. COFUND programmes encourage the movement of researchers across borders and provide good working conditions. The scheme can support doctoral and fellowship programmes.

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- **Research and Innovation Staff Exchange (RISE)**

RISE will support short-term mobility of research and innovation staff at all career levels, from the most junior (post-graduate) to the most senior (management), including also administrative and technical staff. It will be open to partnerships of universities, research institutions, and non-academic organisations both within and beyond Europe. In worldwide partnerships, academia-to-academia exchanges will be permitted.

http://ec.europa.eu/research/mariecurieactions/

1.3. RESEARCH INFRASTRUCTURE

The main objective of the action is to **endow Europe with world-class research infrastructures** which are accessible to all researchers in Europe and beyond and fully exploit their potential for scientific advance and innovation.

All information on the action, work programme and how to apply is available on the H2020 website and the Participant Portal
http://ec.europa.eu/research/infrastructures/index_en.cfm

1.4. FUTURE AND EMERGING TECHNOLOGIES

FET actions are expected to initiate radically new lines of technology through unexplored collaborations between advanced multidisciplinary science and cutting-edge engineering. It will help Europe grasp leadership early on in those promising future technology areas able to renew the basis for future European competitiveness and growth, and that can make a difference for society in the decades to come.

Under Horizon 2020, FET actions have been allocated a provisional budget of 2 696 million euro.

The FET programme has three complementary lines of action to address different methodologies and scales, from new ideas to long-term challenges:

- FET Open funds projects on new ideas for radically new future technologies, at an early stage when there are few researchers working on a project topic. This can involve a wide range of new technological possibilities, inspired by cutting-edge science, unconventional collaborations or new research and innovation practices.
- FET Proactive nurtures emerging themes, seeking to establish a critical mass of European researchers in a number of promising exploratory research topics. This supports areas that are not yet ready for inclusion in industry research roadmaps, with the aim of building up and structuring new interdisciplinary research communities.

- FET Flagships are 1-billion, 10-years initiatives where hundreds of excellent European researchers unite forces to focus on solving an ambitious scientific and technological challenge, like understanding the Human Brain or developing the new materials of the future, such as Graphene.

http://ec.europa.eu/programmes/horizon2020/en/h2020-section/future-and-emerging-technologies

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2. Industrial leadership

The Horizon 2020 Competitive Industries Programme will make Europe a more appealing location to invest in research and innovation. The programme seeks to stimulate the growth potential of European companies, targeting SMEs in particular.

With dedicated support, the programme aims to build leadership in enabling and industrial technologies.

Support is available for a range of Key Enabling Technologies:
- *Advanced manufacturing and processing*
- *Advanced materials*
- *Biotechnology*
- *Information and Communication Technologies*
- *Nanotechnology*
- *Space*

The programme provides support for cross-cutting actions to capture the accumulated benefits from combining several of these technologies.

Access to risk finance

The Industrial Leadership theme also facilitates access to risk finance, stimulating private investment and venture capital in research and innovation; and aims to strengthen the participation of smaller companies by offering support for innovative SMEs across the European Union.

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3.Societal challenges

The Horizon 2020 Societal Challenges Programme reflects the policy priorities of the Europe 2020 strategy and addresses major concerns shared by people across Europe and beyond.

This challenge-based approach brings together resources and knowledge across different fields, technologies and disciplines, including social sciences and the humanities.

The Societal Challenges Programme:
- *Covers activities from research to market with a new focus on innovation-related activities, such as pilots, demonstrations and test beds*
- *Includes support for public procurement and market uptake*
- *Helps to establish links with the activities of the European Innovation Partnerships (EIP).*

Societal Challenges funding will be focused on the following calls:
- *Health, demographic change and well-being*
- *Food security, sustainable agriculture and forestry, marine and maritime and inland water research, and the bioeconomy*
- *Secure, clean and efficient energy*
- *Smart, green and integrated transport*
- *Climate action, environment, resource efficiency and raw materials*
- *Europe in a changing world: inclusive, innovative and reflective societies*
- *Secure societies - protecting the freedom and security of Europe and its citizens.*