

ANNEX A  
RESEARCH LINES, SPECIFIC TOPIC AND INSTRUCTIONS FOR DRAWING UP THE  
RESEARCH PROJECT

1) RESEARCH LINES

**Research line 1: Effects of risk and its perception on safety and well-being**

Representative Professors: **Bocci (ICAR/04), Camisasca (M-PSI/04), Catania (MAT/03), Cattoni (ICAR/07), Comodini (ICAR/09), Covelli (M-PSI/05), Focacci (ICAR/09), Macaluso (BIO/16), Tomasicchio (ICAR/02)**

The conditions of individual and collective well-being can be strongly influenced by the perception of the risks linked to the current climate changes, the high seismic and hydrogeological vulnerability of the Italian territory and the exposure of parts of the territory to strong phenomena of environmental degradation. Indeed, safety assessment and risk forecasting can have clear impacts on economic development and social living conditions. In this context, the original research projects which are promoted are those aimed at defining innovative criteria and methodologies for risk assessment, also through the development of appropriate mathematical models and the use of digital technologies in the public and private sectors, and the implementation of good practices for the evaluation of bio-psychosocial factors. Research topics include: innovative and sustainable techniques for the creation and / or recovery of infrastructures for risk prevention and mitigation, also in relation to its correct perception at individual and collective level, the identification of biological and psychological markers related to stress connected to perceived risk and the psychological factors associated with it, the analysis of the subjective perception of risk and the evaluation of its effects on individual and collective behaviors oriented towards safety and prevention.

ERC areas: PE8 Products and Processes Engineering; SH4 The Human Mind and Its Complexity; LS4 Physiology, Pathophysiology and Endocrinology

**Research line 2: Environmental sustainability and well-being**

Representative Professors: **Arnesano (ING-IND/12 ), Bocci (ICAR/04), Cattoni (ICAR/07), Cioccolanti (ING-IND/09), De Giorgio (M-PSI/02), Focacci (ICAR/09), Melone (CHIM/07), Pedroli (M-PSI/03)**

In this line of research, the original research projects which are promoted are those aimed at the reduction of environmental impact through the design and application of new technologies, processes and methodologies for a more efficient and sustainable development aimed at guaranteeing a high level of well-being for individuals and for communities. These topics must be addressed by integrating transversal skills in the definition of systems and strategies for the reduction of CO<sub>2</sub> emissions, the re-use and recycling of materials, the exploitation of renewable sources, the improvement of the quality of life in indoor and outdoor environments, the analysis of behavior and the assessment of citizens' perception in relation to sustainable development.

ERC areas: PE7 Systems and Communication Engineering, PE8 Products and Processes Engineering; LS7 Applied Medical Technologies, Diagnostics, Therapies and Public Health; SH3 The Social World, Diversity, Population; SH4 The Human Mind and Its Complexity

### **Research line 3: Lifestyles for well-being and health**

Representative Professors: **Arnesano (ING-IND/12), Baldari (M-EDF/02), Manzoni (M-PSI/08), Macaluso (BIO/16), Picerno (MED/33)**

Translational research projects which are developed to understand the mechanisms and processes of lifestyles related to the psychophysical well-being of subjects operating in risk conditions, patients with disabling pathologies and to promote a correct lifestyles for the world population in general, but also for environmental sustainability, in relation to age, gender, diet and level of physical activity. The research objectives must be pursued with innovative and sustainable measurement methods (locally and remotely) and with the analysis of biomolecular, psychological, kinematic, physiological and environmental data, also aimed at customizing interventions. The tools must also be based on new ICT technologies (wearables, IoT, Machine Learning), and innovative molecular biology technologies.

ERC areas: LS4 Physiology, Pathophysiology and Endocrinology; SH4 The Human Mind and Its Complexity; LS2 Genetics, 'Omics', Bioinformatics and Systems Biology; PE7 Systems and Communication Engineering

### **Research line 4: New therapeutic and rehabilitative approaches to health and well-being**

Representative Professors: **Arnesano (ING-IND/12), Bocchio Chiavetto (BIO/13), Cavallo (M-PSI/08), De Giorgio (M-PSI/02), Manzoni (M-PSI/08), Pedrolì (M-PSI/03), Picerno (MED/33)**

Research projects must be implemented relating to the design, the development, the implementation and the validation of innovative high-tech interventions for the health and well-being of subjects with disabling and / or chronic physical or mental diseases, strongly based on the integration of multidisciplinary models and instruments, and in close collaboration with e-health specialists and entrepreneurs. In particular, these new therapeutic and rehabilitative approaches must integrate methodologies and skills in the biological field (molecular markers), psychological field (clinical psychology, health psychology, rehabilitation psychology, physiological psychology and neuropsychology), motor field (motor skills assessment) and in the technological field (positive and persuasive technology, gamification, user experience). Studies aimed at the multidisciplinary assessment of the processes, effects, outcomes and sustainability of the interventions must also be conducted.

Area ERC: SH4 The Human Mind and Its Complexity; LS5 Neuroscience and Neural Disorders; LS2 Genetics, 'Omics', Bioinformatics and Systems Biology; LS7 Applied Medical Technologies, Diagnostics, Therapies and Public Health; PE7 Systems and Communication Engineering

### **Research line 5: Stress, well-being and health in family, professional and healthcare settings**

Representative Professors: **Bocchio Chiavetto (BIO/13), Camisasca (M-PSI/04), Cavallo (M-PSI/08), Comodini (ICAR/09), Covelli (M-PSI/05), De Giorgio (M-PSI/02)**

Research projects must be developed concerning the identification of individual, relational, psychosocial, biological and environmental factors that can cause stressful conditions or promote psychological well-being, health and quality of life in family, professional and healthcare contexts. Integrated approaches must show innovative methodologies for the evaluation of the synergistic effects of the most significant psychological and biological factors in the development of stress and psychological or relational difficulties or disorders. Prevention and improvement strategies must also be promoted, in the family-related, professional and medical sphere, and the evaluation of the interventions implemented.

ERC areas: SH4 The Human Mind and Its Complexity; LS5 Neuroscience and Neural Disorders; LS2 Genetics, 'Omics', Bioinformatics and Systems Biology

## 2) SPECIFIC TOPIC

**Innovative energy conversion systems for sustainable development** (position covered by an apprenticeship contract at Ecospray Technologies)

Representative Professors: **Bocci (ICAR/04), Cattoni (ICAR/07), Cioccolanti (ING-IND/09), Covelli (M-PSI/05), Melone (CHIM/07)**

In this line of research, the research projects which are promoted are those aimed at reducing CO<sub>2</sub> emissions through the development of innovative energy conversion systems with renewable sources. The goal is to ensure sustainable development and an improvement in the quality of life of communities.

ERC areas: PE7 Systems and Communication Engineering; PE8 Products and Processes Engineering; LS7 Applied Medical Technologies, Diagnostics, Therapies and Public Health; SH3 The Social World, Diversity, Population

## 3) INSTRUCTIONS FOR DRAWING UP THE RESEARCH PROJECT

- A. Indicate your name and surname
- B. Indicate one of the research lines among those listed above or the specific topic
- C. Enter the title of your project
- D. Describe the project (using no more than 15000 characters, spaces included) indicating the following:
  1. research topic;
  2. current state of research on the subject;
  3. objectives and methods to achieve them;
  4. an essential bibliography;
- E. Attach the project in PDF format to the application.