

FreeNovation 2024: Can your project idea change biomedical research?

- From genetic associations to disease mechanisms
- New molecular insights in gender medicine
- To the roots: Mathematics to address biology

Submit your application by 16th March 2024!**Exploring New Avenues in Research Funding**

Many scientific breakthroughs have occurred not because success was predictable, but thanks to the pioneering spirit of people who gave free rein to their creativity. But there is little room for free creativity and bold, untried ideas these days. This is why the Novartis Research Foundation (*Novartis Forschungsstiftung*) promotes offbeat project proposals with its FreeNovation program. It calls on researchers in Switzerland to submit proposals that are hard to fund by conventional programs.

This kind of research funding by a Swiss foundation is unique in the field of life sciences in Switzerland. With this program, the Novartis Research Foundation wants to encourage unconventional thinking and further enhance the attractiveness of Switzerland as a research location.

An opportunity for people and ideas

Researchers with a doctorate or equivalent that are employed at a reputable healthcare or healthcare-related organization, university, university hospital, or university of applied sciences are eligible to apply. The projects will be selected by a top-class review panel under the leadership of Prof. em. Gerd Folkers, ETH Zürich, Chairman of the Board of the Novartis Research Foundation.

To ensure that both unusual ideas as well as younger scientists without a research track-record have a place in this funding program, the selection process is anonymized: What counts is the originality of the research approach and its potential to achieve something new. Ideas that involve interdisciplinary research are encouraged. Results from preliminary studies are not a prerequisite. Scientific risk-taking is encouraged.

The results of the funded projects shall be published and made available to the public without patent protection. FreeNovation is all about exploring new avenues, venturing into new dimensions, and further strengthening Switzerland's research landscape.

For the 2024 call for proposals, the Novartis Research Foundation is making available up to a total of CHF 2.7 million for a maximum of 15 projects. Each project can be funded with up to CHF 180,000. This will allow the researchers to pursue their objectives over a period of 18 months.

Guidelines for Applicants and the link to submit proposal are available on
www.freenovation.ch

From genetic associations to disease mechanisms

Disease etiology is often complex, involving multiple genetic and environmental factors. Numerous genome-wide association studies (GWAS) have identified thousands of genetic variants underlying susceptibility to complex diseases. However, these studies do not provide evidence on how the variants contribute to the pathophysiology of the disease. Translating these associations into mechanism is complicated by two factors: 1) they can fall into gene regulatory regions; and 2) they are rarely mapped to one causal variant. Uncovering the mechanisms requires understanding of the molecular, cellular, and physiological events altered by causal genetic variations. Therefore, a key challenge lies in combining GWAS findings with cell physiological data to functionally characterize the associations, thus linking genotype to phenotype. What is the contribution of gene expression variation? What experimental, computational, and conceptual advances will be required to fully elucidate the effects of functional variants on cellular dysregulation and disease risk? Do you have a specific case you wish to explore or a new approach to bridge the genotype/phenotype gap?

Are you inspired to submit a proposal? - We are very much looking forward to it!

Molecular basis of gender medicine

A broad spectrum of development patterns influences a person's sex/gender, reflecting a range of phenotypes rather than binary categories. The World Health Organization has highlighted how sex and gender interact in complex ways to affect an individual's health outcomes. Sex/gender influence health status through genetic, cellular, physiological, and hormonal pathways. These pathways vary over the course of a lifetime and produce differences in susceptibility to disease, disease progression, treatment options & responses, and, ultimately, health outcomes. For instance, Alzheimer's disease is more common in women, but Parkinson's disease is more common in men. Women are about twice as likely to be diagnosed with autoimmune disorders and four times more likely to have migraines. What are the specific molecular mechanisms of such differences? How do gender and sex affect genetic, cellular, physiological, and hormonal pathways? How do these pathways change differently in women and men over the course of one's life? What is the sex-related molecular determinants of these changes? – Deeper scientific insight into these mechanisms could have profound implications for drug discovery and personalized medicine.

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To the roots: Mathematics to address biology

Mathematical modeling helps scientists understand the mechanisms and dynamics underlying experimental observations. Imaging, genomics and other "omics" data, gene–environment interactions, cellular and metabolic pathways, molecular dynamics, viral epidemiology, or cancer progression: At the core of such data analyses is mathematics, the theoretical models underlying the "data crunching". Mathematics makes such data manageable. The choice of the model is essential. Sometimes different models could fit the data. How to decide which model is the most relevant? How can one generate alternative models that better describe and predict new complex biology? Can black box models from artificial intelligence be deconvoluted? Going to the roots, can you use mathematics in unprecedented ways to provide a deeper, or perhaps alternative, interpretation of biological data? Or identify and recognize patterns in data that lead to novel insights into complex biology, drug discovery and medical sciences? Whether you are a mathematician teaming up with a biologist (or vice versa) or a wizard of both traits, we are curious to learn about your ideas!

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