

Molecular Regulatory Networks of Life (R'Life)  
ACADEMY PROGRAMME  
2020-2023

## PROGRAMME OVERVIEW

The aim of the Molecular Regulatory Networks of Life Academy Programme (R'Life) is to broaden our understanding of the function and structure of the genome. The programme provides more information on how various mechanisms create links between different parts of the genome and gene networks and how these connections regulate the functions of life. How do individual differences in genomes, for example, affect the ability of the body to adapt to acute and chronic stress? And what then happens inside the organism in terms of its internal molecular mechanisms? How do the mechanisms that regulate the interaction between the genome and environmental factors affect the phenotype?

The R'Life Academy Programme focuses on basic research in order to produce comprehensive key information on the networks that regulate the function of cells, tissues and individuals. Such comprehensive knowledge can be built by combining new molecular biology and bioinformatics tools. The study of regulatory networks is made possible by significant advances in genome-wide research methods that delve into different layers of information. The R'Life Academy Programme encourages and promotes the adoption of both

new research methods and new scientific approaches across the Finnish research community and thereby contributes significantly to renewal in these disciplines. The programme's consortia enable close cooperation between researchers of different disciplines, which makes it possible to explore new perspectives and, through a broader study of phenomena, achieve scientific breakthroughs in fundamental questions of biology. Another aim is to call attention to the opportunities presented by existing research infrastructures.

### Objectives

- The programme seeks to broaden our understanding of the regulatory networks of organisms instead of individual molecular changes.
- The programme aims to generate new information on the key regulatory mechanisms of cells, individuals and/or populations through the latest advances in molecular biology.
- The programme promotes the adoption of the latest scientific methods, more efficient use of existing research infrastructures and interdisciplinary cooperation.

## FUNDED PROJECTS

### Consortia (funding period 2020–2023)

#### Interplay of genome structure and metabolic network in adaptation (AdaGe)

Paula Jouhten, VTT Technical Research Centre  
H Jussi Sakari Jänntti, VTT Technical Research Centre  
Ville Mustonen, University of Helsinki  
Esa Pitkänen, University of Helsinki

#### Levels of cell fate regulation (FateLevels)

Pekka A. Katajisto, University of Helsinki  
Ville Paavilainen, University of Helsinki  
Maria Vartiainen, University of Helsinki

#### LincRNA Orchestrated Molecular Regulatory Networks of Human Immune Response (LincReg)

Riitta Lahesmaa, University of Turku  
Laura Elo, University of Turku

#### The leukemic matrisome interface as a source of markers and targets for acute myeloid leukemia (ELMI)

Taina Pihlajaniemi, University of Oulu  
Valerio Izzi, University of Oulu  
Jyrki Heino, University of Turku

#### Genomic compatibility as the backstop at the species boundary (xHARES)

Jaakko Pohjoismäki, University of Eastern Finland  
Eric Dufour, University of Tampere

#### Forest Tree Evolution Via Expression Regulation (FOREVER)

Tanja Pyhäjärvi, University of Oulu  
Katri Kärkkäinen, Natural Resources Institute Finland  
Jarkko Salojärvi, University of Helsinki  
Mikko Sillanpää, University of Oulu

#### Nucleomechanical regulation of cell states – from pluripotency to cancer (NucleoMech)

Sara Wickström, University of Helsinki  
Johanna Ivaska, University of Turku  
Antti Mäkitie, University of Helsinki

### Additional projects (funding period 2020–2022)

#### Integrative approach to minor spliceosome regulatory networks

Mikko Frilander, University of Helsinki

#### Molecular regulatory networks of climate adaptation

Timo Hytönen, University of Helsinki

#### Spectrum of smooth muscle cell and fibroblast subtypes in atherosclerosis

Minna Kaikkonen-Määttä, University of Eastern Finland

#### Towards molecular-level understanding of fertilization and sexual selection

Jukka Kekäläinen, University of Eastern Finland

#### A novel family-based sequencing approach and dissection of regulatory networks underlying a colour polymorphism

Johanna Mappes, University of Jyväskylä

#### Single-cell transcriptome and mass cytometry profiling reveals the mechanism of embryonic leukocyte migration

Pia Rantakari, University of Turku

#### Defining the essential downstream targets of the Myc proto-oncogene

Jussi Taipale, University of Helsinki

#### Personalised Phenotypic Diagnostics to Benefit Lung Cancer Patients

Emmy Verschuren, University of Helsinki



## ACADEMY OF FINLAND

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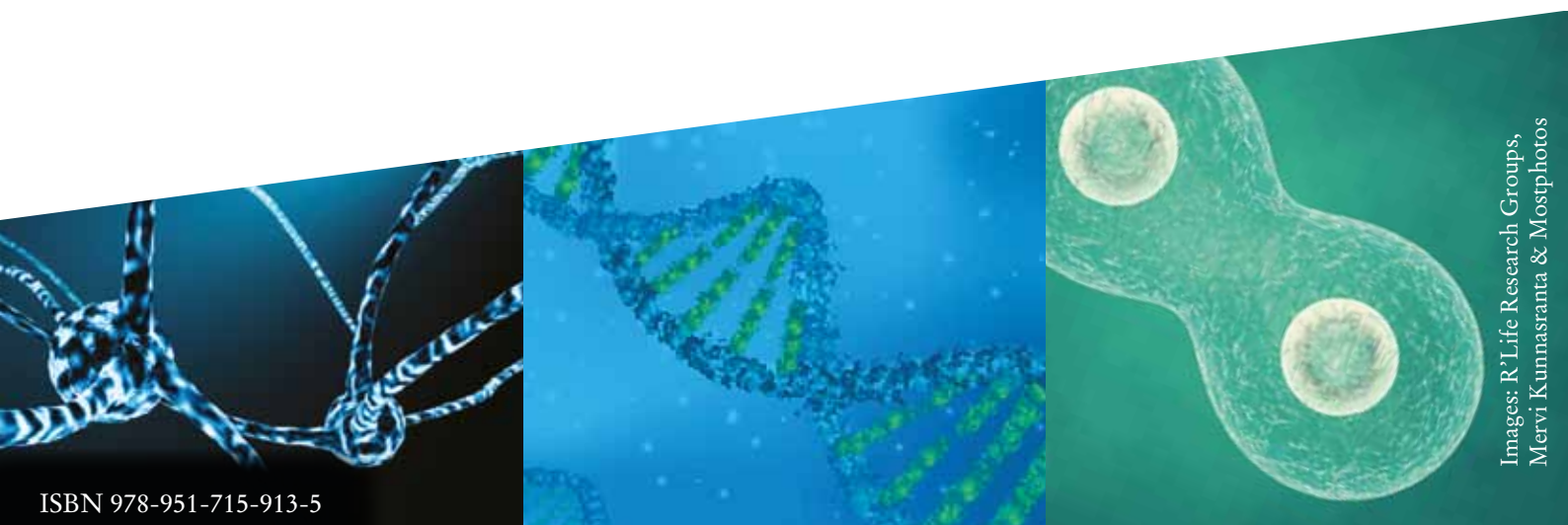
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