UNIVERSITÉ DE GENÈVE

PRESS RELEASE

Geneva | 7 June 2023

3R Prize: flies instead of laboratory mice

The UNIGE has awarded its 3R Prize. This year's prize was awarded for a study on genetic paediatric encephalopathies, the results of which were obtained using an alternative animal model.

"Reduce", "Refine", "Replace": these three principles are at the core of the 3R Prize of the University of Geneva (UNIGE), which rewards each year a research project that is particularly respectful of the animal condition. This year's prize was awarded to two researchers from the Department of Cell Physiology and Metabolism and from the Translational Research Centre in Oncohaematology of the UNIGE Faculty of Medicine. The jury was impressed by their study on genetic paediatric encephalopathies, for which they used an alternative animal model, the fruit fly *Drosophila melanogaster*.

Created in 2016, the 3R Prize of the University of Geneva (UNIGE) rewards research projects that contribute to the advancement of knowledge in life sciences, while helping "reduce", "refine" and "replace" (3Rs) the use of animal models. It is given annually and endowed with 5,000 Swiss francs to support the research work of the awardee.

On 6 June 2023, on the occasion of the annual Faculty of Medicine's award ceremony, the UNIGE prize was awarded to Vladimir Katanaev and Mikhail Savitskiy, respectively full professor and senior research and teaching assistant in the Department of Cell Physiology and Metabolism and in the Translational Research Centre in Oncohaematology of the UNIGE Faculty of Medicine.

© Fabien Scotti

Vladimir Katanaev and Mikhail Savitskiy at the award ceremony on 6 June 2023.

High resolution pictures

The 3Rs as a governing principle

Entitled "Restoration of the GTPase activity and cellular interactions of Gαo mutants by Zn2+ in GNAO1 encephalopathy models" and published in *Science Advances*, this study deciphers the mutations in the *GNAO1* gene that cause genetic paediatric encephalopathies - rare diseases that lead to severe motor and intellectual disabilities from birth - and suggests how a zinc-based treatment could significantly improve neurological symptoms.

"By relying on new technologies and knowledge sharing, these scientists have brilliantly integrated the 3R principle throughout their research," says Daniele Roppolo, Director of Animal Experimentation at the UNIGE.

An alternative animal model

In order to identify the therapeutic potential of zinc, the research team had to screen for more than 2000 molecules. To do this, they first relied on biochemical approaches and *in vitro* methods based on cell lines cultured in the laboratory. A collection of pharmacological molecules containing 2736 compounds was tested on these cells and three promising treatments were identified.

The selected molecules were then tested on Drosophila flies carrying genetic mutations that exactly reproduce the most frequent mutations in patients. The scientists thus involved the animal model at the very end of the research programme, replacing the commonly used vertebrate model (the mouse) with an invertebrate model (the fruit fly).

The two scientists are also the founders of the HumanaFly platform. Based at the UNIGE's Faculty of Medicine, this service-oriented research facility is available to scientists looking for non-vertebrate models - in this case the fruit fly *Drosophila melanogaster* - to advance their work in line with the 3Rs. Thus, the UNIGE 3R Prize highlights this year a work that will enable the application of the 3R beyond the laboratory and the awardees' field of research.

UNIGE proactive in promoting the 3Rs

This year, the jury of the 3R Prize was composed of five UNIGE researchers: Emi Nagoshi (President of the jury and 3R Prize 2016), Francis Rousset (3R Prize 2022), Dominique Soldati-Favre, Jean-Luc Wolfender and Pierre Cosson. Seven applications were submitted: "This shows how the efforts made by the Direction of Animal Experimentation and the Rectorate to promote the 3Rs are bearing fruit," says Daniele Roppolo.

The UNIGE conducts regular information campaigns to make researchers aware of funding sources, existing awards and training opportunities for 3R projects, both within and outside the university. It is a member of the Swiss 3R Competence Centre (3RCC), which promotes research in the 3Rs at national level. Four UNIGE projects have been pre-selected in a funding scheme currently open by the 3RCC; two other UNIGE 3R projects were funded in 2022 in the context of the National Research Programme "Advancing 3R" of the Swiss National Science Foundation.

contact

About the 3R Prize:

Daniele Roppolo
Director of Animal Experimentation
Rectorate
UNIGE

+41 22 379 74 39
Daniele.Roppolo@unige.ch

About the study:

Vladimir L. Katanaev
Full Professor
Department of cell Physiology and Metabolism
Translational Research Centre in Oncohaematology
Faculty of Medicine
UNIGE

+41 22 379 53 53
Vladimir.Katanaev@unige.ch

DOI: 10.1126/sciadv.abn9350

UNIVERSITÉ DE GENÈVE
Communication Department
24 rue du Général-Dufour
CH-1211 Geneva 4

Tel. +41 22 379 77 17

media@unige.ch
www.unige.ch