

Animal experiments

3Rs Awards 2021 go to researchers at the University of Bern

The Swiss 3RCC has awarded Bernhard Voelkl from the Vetsuisse Faculty of the University of Bern the 2021 3Rs Award in recognition of his work supporting researchers to better design animal studies to improve research quality and reduce animal use. The 2021 3Rs Young Investigator Award went to Pauline Zamprogno from the ARTORG Center for Biomedical Engineering Research, also at the University of Bern, for her contribution to a lung-on-chip model, which aim at replacing animals testing. With their research the awardees not only help promote the 3Rs principle, which aims to replace, reduce and refine animal experiments, they communicated their projects in an exemplary manner to encourage other researchers to adopt these novel approaches in their work.

Bernhard Voelkl and his colleagues at the Animal Welfare Division of the Veterinary Public Health Institute recommend that scientists introduce biological variation such as different mouse strains, sex or housing conditions into their animal experiments to improve the quality and reproducibility of their results. Traditionally animal studies are conducted under highly standardized laboratory conditions, which was meant to improve their quality. Paradoxically, such studies are more difficult to replicate by other scientists. Adding variability allows researchers to improve the reproducibility and translatability of their results. This ultimately means that fewer animals are wasted for research that ends up being inconclusive because its design was not optimal.

Pauline Zamprogno helped to develop a new lung advanced *in vitro* model, called lung-on-chip, which is a promising alternative to animals for studying lung disease and identifying new therapeutic targets. The new model is a further development of the first-generation lung-on-chips, which were mounted on silicone-based (PDMS) membranes. By contrast, Zamprogno at the organ-on-chip lab developed a purely biological membrane made of lung extracellular matrix proteins. This model reproduces some key features of the alveoli in term of composition, structure and microenvironment. It opens up new possibilities for basic research on pulmonary diseases as well as studies to predict the safety and efficacy of new drugs.

The jury consisted of independent external reviewers from the Charité 3Rs (Berlin, DE) and the North American 3Rs Collaborative/University of Washington (USA) as well as a representative of the Swiss Federal Food Safety and Veterinary Office (FSVO). The jurors emphasised the importance of comprehensive communication as demonstrated by the award winners. The 3Rs Award 2021 and Young 3Rs Investigator Award recipients will receive CHF 4,000 and CHF 1,000 respectively to support their studies. Furthermore, they will get the opportunity to present their awarded research at the Swiss 3Rs Day 2022 and in a featured video.

--End--

References:

Publications Bernhard Voelkl

Voelkl et al., (2021): *The standardization fallacy*. <https://doi.org/10.1038/s41592-020-01036-9>

- Voelkl et al., (2020): Reproducibility of animal research in light of biological variation. <https://doi.org/10.1038/s41583-020-0313-3>
- Voelkl et al., (2018): Reproducibility of preclinical animal research improves with heterogeneity of study samples. <https://doi.org/10.1371/journal.pbio.2003693>
- Voelkl et al., (2016): *Reproducibility crisis: Are we ignoring reaction norms?* <https://doi.org/10.1016/j.tips.2016.05.003>
- Video: <https://www.youtube.com/watch?v=-tiZeQQDpJg>

Publication Pauline Zamprogno:

- Zamprogno et al., (2021): *Second-generation lung-on-a-chip with an array of stretchable alveoli made with a biological membrane*. <https://doi.org/10.1038/s42003-021-01695-0>
- Zamprogno et al., (2021) *Mechanical properties of soft biological membranes for organ-on-a-chip assessed by bulge test and AFM*. <https://doi.org/10.1021/acsbiomaterials.0c00515>
- Video: <https://youtu.be/s6bTzRmWr9w>
- Animation fabrication process 2nd-generation lung-on-chip: <https://youtu.be/9UW-565hgjQ>

3RCC Contacts:

Questions about the 3Rs Award: Jenny Sandström, Executive Director, +41 79 218 29 80;
jenny.sandstrom@swiss3rcc.org

General enquiries: Chantal Britt, Communications, +41 76 588 08 24;
chantal.britt@swiss3rcc.org