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Press Release

Redefining Research: Swiss 3RCC Awards Honor Leading 3Rs Innovators

The Swiss 3R Competence Centre (3RCC) proudly announces the winners of the 2024 3Rs Award and the Young 3Rs Investigator Awards, honoring outstanding contributions to the Replacement, Reduction, and Refinement of animal use in scientific research. Following a rigorous selection process—including internal screening and external evaluation by four independent international experts—the jury has awarded the **2024 3Rs Award** to **Fides Zenk (EPFL)** for her pioneering work on epigenetic regulation during early embryonic brain development using human brain organoids. The **Young 3Rs Investigator Awards** have been granted to **Doris Zauchner (ETH Zurich)** for developing a personalized, non-animal model of the rare bone disease Osteogenesis Imperfecta, and to **Manon Murdeu (EMPA)** for creating a human-based placenta-embryo chip to assess developmental toxicity during pregnancy. The primary 3Rs Award, accompanied by a CHF 4,000 prize, honors a major contribution to the 3Rs principle. The two Young Investigator Awards, each worth CHF 2,500 and co-funded by the National Research Programme NRP 79 – Advancing 3R, recognize early-career scientists whose research significantly advances the goals of Replacement, Reduction, or Refinement in the use of animals in science. The 3RCC congratulates all three awardees and thanks every applicant for their valuable efforts to advance the 3Rs in Switzerland.

Fides Zenk Wins 3Rs Award for Pioneering Animal-Free Brain Research



Fides Zenk of EPFL has received the 2024 3Rs Award from the Swiss 3R Competence Centre (3RCC) for her groundbreaking work using human brain organoids to study early neurodevelopment. Her research provides a powerful new approach to understanding how genes are regulated during early brain formation—a key to unlocking the mechanisms behind neurodevelopmental disorders. Traditionally, such studies have relied heavily on animal models, especially mice, which often fall short in mimicking human-specific biology. Zenk’s work challenges that norm. By mapping epigenetic changes at single-cell resolution in lab-grown miniature human brains—known as organoids—her team has developed a

human-relevant, animal-free model that is both scalable and scientifically precise. Reviewers praised the project for “bringing a high-quality human-based approach to a

field that has historically relied heavily on animal use.” In Switzerland and across Europe, tens of thousands of mice are used annually in epigenetics and neurodevelopmental research. Zenk’s approach has the potential to dramatically reduce this number and set a new standard for human-relevant neuroscience. “I’m honored to receive this year’s 3RCC Award, which recognizes our commitment to developing brain organoid models to study the epigenetic mechanisms underlying human neurodevelopmental disorders”, said Dr. Zenk. “Our goal is to generate knowledge that serves human neuroscience. By applying single-cell technologies to human brain organoids, we aim to uncover molecular processes in a human-relevant context—bridging and expanding upon insights previously gained from animal models. Ultimately, we hope to contribute to the development of reliable and accessible in vitro systems for neuroscience research.” She added: “I’m grateful to the Swiss 3RCC and the reviewers for their recognition of my work. It’s very motivating to see the value placed on human-based approaches and science communication. The 3RCC’s efforts to promote innovative, ethical, and high-quality research are very inspiring. They play a crucial role in advancing more human-relevant science while reducing reliance on animal models — a mission that I fully support and am proud to contribute to.”

Young 3Rs Investigator Awards

The 2024 Young 3Rs Investigator Awards have been awarded to Doris Zauchner (ETH Zürich) and Manon Murdeu (EMPA) for their outstanding work in advancing human-relevant alternatives to animal testing. Their innovative research in rare disease modeling and reproductive toxicology exemplifies the 3Rs principle by reducing animal use while enhancing the quality and ethical standards of biomedical science.

Doris Zauchner Recognized for Pioneering Non-Animal Research in Rare Disease Modeling



Doris Zauchner, a doctoral researcher at ETH Zurich’s Department of Health Sciences and Technology (D-HEST), has received a 3Rs Young Investigator Award for developing a personalized, animal-free model of Osteogenesis Imperfecta (OI), a rare genetic disorder that causes brittle bones. Her work introduces a cutting-edge “OI-on-a-chip” platform—an organoid-on-chip system that mimics human bone tissue using patient-derived cells, embedded in a synthetic, animal-free hydrogel matrix. Traditionally, OI research has relied on animal models such as mice, zebrafish, and dogs. Despite over 500 studies in the last

two decades and dozens of clinical trials grounded in animal research, these models often fail to capture the complexity and variability of human OI. Zauchner's human-relevant alternative addresses this gap directly. "Our in vitro model of Osteogenesis Imperfecta aims to provide a human-based alternative to animal models to better understand the disease and explore potential treatments," said Zauchner. "I hope tools like ours will help advance rare disease research and reduce reliance on animal models in the future." The platform allows researchers to observe how cells from OI patients produce and organize collagen—a protein essential for bone strength—and how they respond to mechanical stress, closely mimicking the forces bones experience in the human body. This capability provides a more accurate, ethical alternative to animal testing and aligns with the Replacement principle of the 3Rs. Developed in collaboration with the University Children's Hospital Zurich (KISPI) under the SNF-NRP79 'Advancing 3R' initiative, the model could support personalized treatment strategies, optimize preclinical testing, and minimize unnecessary animal use. By generating reliable, human-specific data early in the research pipeline, Zauchner's innovation also improves the design of later-stage studies. Reviewers praised the project as "a strong and thoughtfully designed application that addresses an important unmet need in rare disease research," highlighting that "the impact is clear: the model replaces traditional preclinical animal studies in early-stage research and reduces unnecessary animal use by providing more reliable human data upfront." Beyond OI, this human-based platform could be adapted for other musculoskeletal and matrix-related diseases, including osteoporosis and fibrosis. Zauchner's work represents a significant step toward a future where personalized, organ-on-chip technologies drive more predictive and ethical biomedical research.

Manon Murdeu Wins 3Rs Young Investigator Award for Breakthrough in Pregnancy Safety Testing



Manon Murdeu, a doctoral researcher at Empa's Particles-Biology Interactions Lab, has received a 3Rs Young Investigator Award for developing a groundbreaking placenta-embryo chip—an innovative, human-based tool to assess the effects of chemicals, drugs, and nanoparticles during pregnancy without using animals. Her work tackles a major gap in health research: the lack of safety data on how substances affect pregnant women and developing embryos. Currently, over 90% of approved drugs and most environmental chemicals lack reliable data on their safety during pregnancy. Due to ethical and legal restrictions, pregnant women are rarely included in clinical trials. As a result, nearly all testing for developmental toxicity still relies on animal experiments—particularly in rodents—despite significant biological differences between species. Each standard study can involve hundreds of animals, and globally, tens of thousands are used annually for this purpose. Murdeu's model offers a compelling alternative. Her chip co-cultures human placenta and embryonic tissue in a simple, pump-free system that mimics the maternal-fetal interface. It allows scientists to study how substances transfer through the

placenta and affect early development—providing human-relevant insights that animal models often miss. Importantly, the chip’s user-friendly design makes it accessible to researchers without specialized training in microfluidics. Reviewers praised the project’s scientific rigor and far-reaching potential: “The development affects very high animal numbers around the world.” “It is encouraging to see the model gaining attention from international stakeholders and being positioned for broader regulatory relevance.” “I am particularly impressed by the effort to fill a significant data gap in the evaluation of toxicokinetics and toxicodynamics during pregnancy, an area where data are lacking for the vast majority of approved drugs and environmental chemicals.” Murdeu states: “Receiving this award is both an honor and a motivation to push the boundaries of women’s reproductive health research and, hopefully, it will inspire other young scientists to develop and improve new human-based alternatives to animal models.” She adds: “With our model we aim to gain early pre-clinical data for drug and nanoparticle hazard assessment, contributing to the protection of pregnant women and developing fetuses while reducing the need for extensive animal testing.” With growing interest from research and regulatory communities, Murdeu’s placenta-embryo chip could become a first-tier tool in international safety assessment frameworks. Her work stands to significantly reduce the use of animals in developmental toxicity testing while improving protections for maternal and fetal health.

About the Swiss 3R Competence Centre’s (3RCC) Annual 3R Awards

The Swiss 3R Competence Centre (3RCC) is dedicated to promoting the 3Rs principle of Replacement, Reduction, and Refinement of animal experimentation, fostering advancements in 3Rs research and development that benefit both science and animal welfare. Award recipients are selected based on the quality and impact of their contributions to the 3Rs in various contexts, including scientific, regulatory, industrial, and educational fields. Nominations pass an initial screening and shortlisting, followed by the appraisal of a jury composed of international and national 3Rs experts. These awards reflect the 3RCC’s ongoing mission to foster a culture of responsibility and innovation in Swiss research. The Centre extends its warmest congratulations to this year’s awardees and thanks all applicants and reviewers for their valuable contributions to the advancement of the 3Rs.

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