



blood extraction begins, animal welfare issues remain, as potential suffering is not alleviated by anesthetizing or euthanizing the fetus, and the animals are simply left to asphyxiate. Thus, a binding regulatory control of FBS production must be implemented that takes animal welfare and ethical concerns into account.

After the panel discussion, Dr Wiest presented a video to demonstrate the application protocol of the cellasys #8 assay.

Based on the positive feedback on the presentations and the panel discussion, the consensus of the more than 50 participants from 13 countries was that FBS is not a suitable and future-proof medium supplement for an exact and humane science and that only a joint effort by industry, authorities, universities and animal welfare can contribute to a paradigm shift towards more reliable research and testing methods. One of the next steps is to contact the serum-producing industry to encourage discussions to find a

common solution for the animal welfare issues and the development of animal-friendly media supplements.

A detailed report on the symposium is in progress as well as a joint publication by the speakers on alternatives to FBS. A hands-on workshop in cooperation with cellasys GmbH (again with the support of the Renate-Bentlin Stiftung für Nutztierschutz) will be held in 2021. Therein, participants will be trained on how to perform the cellasys #8 assay to support the transition to FBS-free media for the cell and tissue cultures they are using.

Tilo Weber and Kristina Wagner

Animal Welfare Academy of the German Animal Welfare Federation, Neubiberg, Germany

Meeting Report

A New Gold Standard: Paradigm Shift in Research on Human Diseases and Therapy Developments – Animalfree Research Forum 2020

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On November 19, 2020, the Swiss-based foundation Animalfree Research held its 10th forum. This year's topic was "A new gold standard: paradigm shift in research on human diseases and therapy developments". The forum was held online (Fig. 1) and attracted over 60 participants from both Switzerland and abroad.

Dr **Silvia Frey**, Director at Animalfree Research, opened the forum, introducing the goals of Animalfree Research and the aims of the forum.

Dr **Miriam Zemanova**, Scientific Associate at Animalfree Research, kicked the meeting off with an introductory talk on the topic. Dr Zemanova spoke about the high failure rate in drug development due to the low predictive power of animal testing in biomedical research, the reasons why animals constitute poor models of human diseases, and what the barriers to achieving the shift from animal testing to human-relevant, animal-free methods might be.

Dr **Martin Smieško**, Research Associate at the Department of Pharmaceutical Sciences, University of Basel, spoke on "*In silico* screening methods for 3R: theory and practice". *In silico* methods can be employed to screen enormous amounts of data to find the best possible chemical compound for interaction with a specific biological target, yielding a desired pharmacological effect. Compound toxicity can be evaluated either through similarity search or through creating a computer model for the observed

phenomenon. Dr Smieško's group has been pioneering the use of *in silico* screening techniques, implemented in the VirtualTox-Lab platform, for early recognition of the off-target binding of drugs, chemicals, and natural compounds, with the ambition to reduce the extent of animal testing. Dr Smieško explained that the pharmaceutical field has relied too much on animal studies and that animal testing is being implemented too early in drug development. He concluded that *in silico* technology has great potential that is yet to be unleashed in toxicology and pharmacology.

Dr **Samuel Constant**, CEO of Epithelix, held a lecture entitled "3D human airway epithelial models to study SARS-CoV-2 pathogenesis". Dr Constant provided an overview of SARS-CoV-2 infection, which affects the airway epithelial cells. Epithelix has developed standardized air-liquid interface 3D human airway epithelial cultures of nasal or bronchial (MucilAir™) and small-airway (SmallAir™) origins. These models closely mimic the morphology and function of the native tissues: cilia formation and beating, mucus production and secretion, mucociliary clearance, and secretion of antiviral molecules. Epithelix have successfully used their innovation for the development of antivirals against influenza, rhinoviruses, respiratory syncytial virus, and others. These reconstituted human airway epithelial models can be used to characterize viral infection kinetics, tissue-level

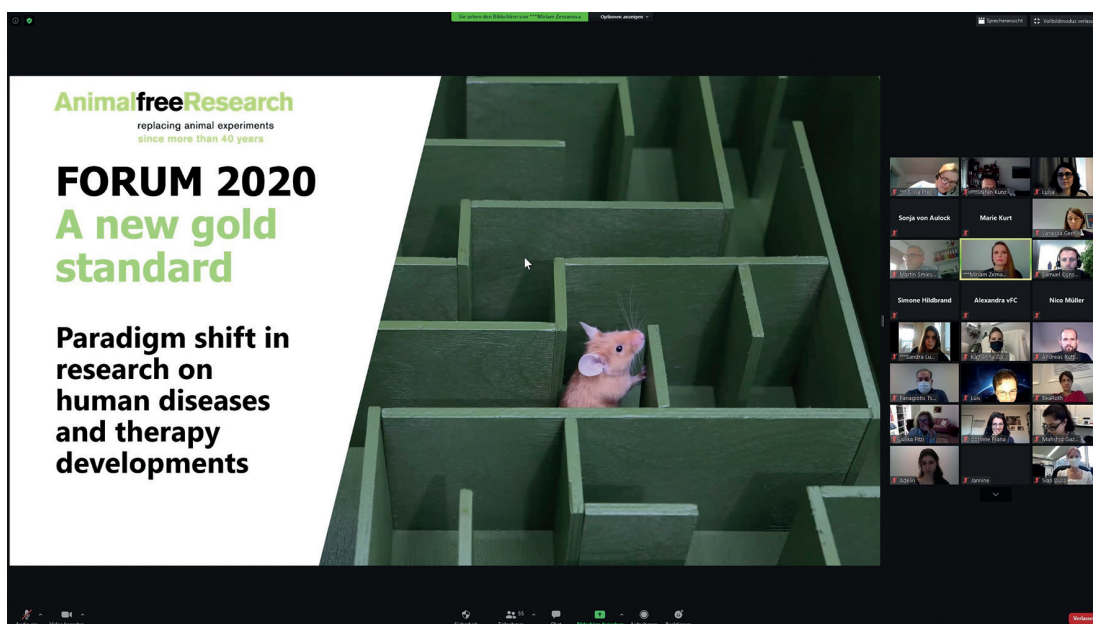


Fig. 1: Animalfree Research forum 2020 was held online

el tropism, and transcriptional immune signatures induced by SARS-CoV-2, and are highly relevant for the preclinical evaluation of antiviral candidates.

Dr **Luisa Bastos**, Animals in Science Program Leader at Eurogroup for Animals in Brussels, presented the current status of European initiatives to phase out animal testing in her talk “Current progress towards animal-free research in Europe”. Dr Bastos explained that while the European Union (EU) seems highly committed to empower innovation and renew education, it is still unclear how its initiatives will drive human-relevant animal-free innovation. Though the EU has prided itself as the world leader in advancing animal-free science and as having the strongest legislation in the world on the protection of animals used in research, testing, and education, it is now lagging behind, for instance, the US Environmental Protection Agency (EPA), which has already set clear targets, timelines, and a road-map to end the use of vertebrate animals in regulatory testing. In contrast, until today, the EU has no clear plan to move towards more effective human-focused non-animal methods. Dr Bastos further discussed the opportunities for animal-free research in the EU and beyond. The recent reviews by EURL ECVAM on non-animal methods in specific areas of disease have put forward unprecedented perspectives on the future investments necessary to move towards the best innovative non-animal technologies and models for investigating disease mechanisms and potential therapies.

The last speaker, lic. iur. **Vanessa Gerritsen**, Deputy Executive Director at *Tier im Recht*, covered the situation in Switzerland in her talk “Successive shift towards animal-free research in Switzerland from a policy perspective”. Ms Gerritsen explained that the Swiss Constitution enshrines basic rights, recognizes the dignity of man and creature, and imposes various tasks on the Confederation, including the regulation of animal, health and environmental protection, and the funding of research. All these concerns

are on the same level and are to be implemented in the best possible way, taking into account conflicting constitutional interests. Animal welfare is considered a high priority in Switzerland but, even though, according to the Swiss Animal Welfare Act, burdensome animal experiments may only be approved if they are indispensable, animal experiments continue to be approved without a diligent weighing of the competing interests. The reasons for this are the highly complex and expensive authorisation system, posing a burden for researchers and overwhelming the authorities, and the fact that animal experimentation committees consist predominantly of people with interests in experimental animal research. The number of animals used in experiments is increasing, particularly in the categories of moderate to high severity. There is hardly any movement indicating a departure from animal experimentation in the Swiss research community, which is why political impulses are necessary, and a new popular initiative to abolish animal experiments is currently underway.

The topics of the ensuing discussion with the speakers and participants included the ethics of animal experiments, perception of animal-free methods, and the complexity of the issue of animal use in science. Since all of the invited speakers stressed the need for more financial support of alternative methods, information on an initiative launched by Animalfree Research calling for redirection of at least half of the Swiss public research funding in biomedical research towards projects based only on human relevant animal-free methods concluded the forum.

Miriam A. Zemanova and Silvia Frey

Animalfree Research, Bern, Switzerland

(zemanova@animalfree-research.org)