



situation thanks to the use of human cells and tissues and are quantifiable in contrast to expert-based scoring of animal methods.

- Shifting from *in vivo* to *in vitro* requires a high level of confidence and reproducibility in the experimental models. In tissue engineering this can be achieved only with huge investments for tissue production, quality controls and validation for regulatory acceptance.
- Recent developments in the cultural specificity of India with regard to cows would limit access to the BCOP for eye irritation. This can be conveniently replaced by other validated methods such as ICE or STE.
- Alternative methods provide significant opportunity to those who are interested in making a career in toxicological research.
- Industry is open to participate in and support initiatives in the area of research and validation of non-animal methods.
- There is a pertinent need to launch an Indian Society for Alternatives to Animal Experiments.

Post-congress training workshops

After the Congress, national level training workshops in “*Handling of Reconstructed 3D Human Tissue Models*” were conducted at NFB, Mumbai, lead by Dr Pellevoisin and supported by Prof. Akbarsha. The two two-day workshops were on *OECD TG 439 – In vitro testing of skin irritation of chemicals using*

Reconstructed Human Epidermis (RHE) and OECD TG 492 – In vitro testing of eye irritation of chemicals using Reconstructed Human Corneal Epithelium (RHCE). Both workshops included an introduction on alternatives to animal experiments and the *in vitro* tissue model, demonstration of SOP of the respective testing protocols, hands-on practice using control and test samples, MTT assay, ELISA plate reading, data analysis and interpretation, followed by certification. The participants (18 per workshop) were excited about the experience. EPISKIN Academy provided the tissue samples as a generous gift. We thank the staff of NFB, particularly Benedict Mascarenhas, Dr Prathiksha Alag (NFB) and Dr Gaganjyot Kaur (NFB).

The overwhelming success of the National Congress and workshops has paved the way for further deliberations and training in the area of alternative methods for safety testing, thus providing a platform for this very important area of research and taking India forward on the global roadmap towards developing and implementing validated alternative methods.

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Meeting Report

Inauguration of the Centro 3R for the Promotion of 3Rs Principles in Teaching and Research

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The first European interuniversity center dedicated to promoting 3Rs principles in teaching and research was inaugurated in Pisa, Italy on March 14, 2018. The Centro 3R¹ was spearheaded by the Universities of Pisa and Genoa. Membership is open to all Italian universities and agreements for twinning across Europe and other countries are being pursued.

The event was attended by around 90 participants including the press, members of animal welfare associations, pro-life associations, industry, technology hubs, scientists and students. It

was officially opened by the Vice Rector of the University of Pisa, Professor **Nicoletta De Francesco** and the Rector of the University of Genoa, Professor **Paolo Comanducci**. They both remarked on the timeliness of the initiative and the relevance of teaching and learning in the context of the 3Rs as well as the role of universities in free learning and research. Nicoletta De Francesco highlighted the University of Pisa's commitment to animal welfare and new technology and invited other universities to join the initiative. Their opening speeches were fol-

¹ <http://www.centro3r.it>

lowed by a brief outline of the Centro 3R's objectives by **Arti Ahluwalia**, the current director. She described the Centro's mission to promote rational and scientific thinking in experimental science through a multidisciplinary teaching and research approach inclusive of all 3Rs as a means to accelerate the R of replacement. The projects to develop an open resource-sharing web platform and interdisciplinary elective courses were also mentioned.

Following the introductory speeches, **Francesca Pistollato** expressed EURL ECVAM's endorsement and support for the Centro 3R. She gave an overview of the resources available through the EU and JRC and discussed the importance of multidisciplinary for pushing forward non-animal technology. **Costanza Rovida** from CAAT-Europe also congratulated the new Centro 3R and showed some examples of how associations and research groups come together to generate excellence. She underlined that the use of new technology including fluidics, adverse outcome pathway identification, bioinformatics and stem cells requires a multidisciplinary approach, which is fostered by knowledge sharing. The Centro 3R is a pioneering example. The director general of animal welfare at the Italian Ministry for Health, Dr **Silvio Borrello**, offered congratulatory messages to the Centro 3R and remarked on the importance of the initiative, as did **Isabella De Angelis** and **Emanuela Testai** from the Italian Institute of Health (ISS) and the Italian Platform for Alternative Methods (IPAM) by means of a brief but inspiring letter that was read out.

Massimo Riccaboni, professor of economics at IMT School for Advanced Studies in Lucca, Italy gave a lecture on "Pharmacoeconomics, transparency and public opinion", illustrating, with concrete examples how the (high) price of drugs is determined by clinical trial failures and how this could be mitigated by sharing both negative and positive data. He stated that this also applies to research in general, i.e., the high price of scientific research, including the use of animals, could be reduced by sharing data on failed experiments. "Contribution of education and training to Culture of Care" by **Jan van der Valk** from the 3R Center at the University of Utrecht, the Netherlands pointed out that ensuring an appropriate culture of care will promote improved animal welfare and therefore enhanced scientific outcomes. A thoughtful discourse on the ethics of care was given by the well-known bioethicist **Luisella Battaglia**, who addressed the role of humans in making decisions about animal welfare and as curators of the planet.

A delicious vegetarian lunch, kindly sponsored by a local caterer, was followed by two excellent lectures on the 3Rs

from two different scientific angles. The first, entitled "Pharmacological Research and the 3R principles" from **Giambattista Bonnanno**, University of Genoa, Italy gave evidence on how both industrial and academic pharmacological research, which positively impact our quality of life, still need to rely on animal experiments. According to Bonnanno, since Replacement seems to be far from a concrete option at present, Reducing and Refining are the two major challenges to be undertaken for the continuous improvement of animal welfare. The second, "Computational Systems Biology propels the 3Rs", by **Corrado Priami**, University of Pisa, Italy outlined in a simple but compelling way how computational biology approaches implemented before starting an experiment can lead to an enormous saving in time, money and animals. Rounding off the lectures, **Helena Kandarova**, MatTek In Vitro Life Science Laboratories, Bratislava, Slovakia presented an informative lecture on "Efforts of international business in 3Rs" and explained how MatTek supports researchers across the globe.

The final item on the program was a round table discussion on the potential of the Centro 3R in science, economics and society chaired by the journalist **Marco Colombini**. Panelists were **Michela Kuan**, Italian anti-vivisection league (LAV), **Giuliano Grignaschi**, Research4Life, **Bruna AnnaMaria Monami**, LEAL (Anti-Vivisectional League) and **Stefano Prete**, Toscana Life Sciences. The animated discussion revolved around the impact of education, the role of the Centro 3R, and research funding. Mr Colombini summarized the main points of the meeting, stressing the efforts of the Centro3R in promoting the training of young researchers to improve *in vivo*, *in silico* and *in vitro* models and technologies for accelerating the validation and acceptance of alternative methods.

Overall this was an excellent opening for the Centro 3R, with a buzz of new ideas and aspirations to help the advancement of non-animal methods in basic and applied bioscience, spanning from medicine, pharmacology and toxicology to the evaluation of health and environmental risk assessment.

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