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Improving the welfare of animals: Researchers develop computer-aided models to replace animal testing

(Stuttgart) – Every year, October 4 is all about the protection of animals. On World Animal Day, animal welfare organisations around the globe advocate the respectful treatment and welfare of animals. One of the central demands of the animal activists is to abolish animal testing and to use alternative testing methods instead. In this context, the European Union has taken a huge step forward at the beginning of this year: On March 11 a full ban on the marketing of cosmetics and hygiene products tested on animals entered into force in the EU.

The search for alternative testing methods for safety assessment is thus more pressing than ever. The development of such non-animal testing methods, especially when it comes to reliably predicting long-term toxic effects, represents a major scientific challenge. The NOTOX project, which is co-funded by the European Commission and Cosmetics Europe, the European trade of the cosmetics industry, significantly contributes to this endeavor by developing and validating predictive bioinformatics models characterizing long-term toxicity responses. These computer-aided models will help predict possible long-term toxic effects on the human body. In consequence, the use of living organisms to test the safety of substances to be found in daily-life products such as make-up, soap or toothpaste is no longer needed.

Computer-aided models as an alternative to animal testing

The liver is the central organ for the elimination of toxic substances in the human body. Therefore NOTOX scientists closely examine in test-tube experiments how such substances affect human liver cells in the long run. The processes and reactions they observe in the cells are being translated into highly complex computer models. The overall goal is to develop algorithms that closely mimic the processes which actually take place in human tissues when exposed to toxic substances. These computational models will allow for reliable long-term predictions and thus help to replace animal testing in the long run.

In order to achieve this ambitious goal, NOTOX brings together eleven internationally renowned and interdisciplinary research teams from all over Europe, including academic research laboratories and four small and medium sized enterprises (SMEs). In the NOTOX project, Insilico Biotechnology will use its systems biology platform to develop a new computer model of the metabolism of mammals including the signal and regulatory mechanisms. It will be optimized to simulate the effects of dose-dependent substances in several steps from molecule to tissue levels. Here, Insilico Biotechnology will apply innovative methods for high-performance grid computing. At the same time, liver cell and tissue cultures will be developed on the experimental project platform and tested for suitability for toxicity analyses. Laboratory and computer methods will be linked to develop a safe and easy-to-handle testing method which will render animal testing superfluous.

Press Release

NOTOX



NOTOX in motion: Scientists open their labs for camera crew

Over several months a film team captured statements and pictures of NOTOX scientists in various settings and on different occasions: during project meetings and at work in their laboratories. The result is a vivid glance behind the scenes of the project, with exciting insights into the challenges of developing validated alternative testing methods. Moreover, the film shows how cutting-edge research on alternative testing methods contributes to improving the overall welfare of animals.

The NOTOX film is available on the project website: <http://www.notox-sb.eu/film>.

Press Release

The NOTOX logo features the word "NOTOX" in a bold, blue, sans-serif font. A stylized graphic of a DNA double helix is integrated into the letter "O", with the helix structure extending through the letters.

Insilico Biotechnology is the market leader in solutions and software to simulate living cells. Its interdisciplinary team of experts offers customised solutions for efficient manufacturing of biotechnological products and for testing drugs by utilising high-performance computing and the company's own software. Insilico technology cuts the time, risks and costs involved in development processes for leading international companies in the chemical and pharmaceutical industries. Insilico is a privately run Stuttgart-based company founded in 2001. www.insilico-biotechnology.com

NOTOX: To advance research in the field of alternative testing methods for long-term systemic toxicity, the Research Initiative SEURAT-1 was established in 2011. It stands for "Safety Evaluation Ultimately Replacing Animal Testing". This initiative, comprising six research projects as building blocks, pursues a common strategy "towards the replacement of current repeated dose systemic toxicity testing in human safety assessment". One of the SEURAT-1 research projects is NOTOX, which started in 2011 and will run for five years. The 9 million € project is co-funded by the European Commission and Cosmetics Europe, the European trade association which represents the interests of the cosmetics industry. Project coordinator is Prof. Elmar Heinzle of Saarland University, Department of Biochemical Engineering. The research results achieved by SEURAT-1 projects will not only be relevant for the cosmetics industry, but are expected to also have an impact on the chemical and pharmaceutical industry.

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The NOTOX film as well as cleanfeed and additional footage material is available upon request from:

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