

NANOTECHNOLOGY - TOWARDS REDUCING ANIMAL TESTING

Organised by the Institute of Nanotechnology, and held in London, 28th-29th May 2008

Over 60 delegates, were present to hear speakers outline, some of the ground-breaking progress being made towards developing new hi-tech non-animal alternative methods, and to discuss new approaches to regulatory testing, that avoids the use of animals. Here are some of the highlights:

Dr Beatrice Schaak spoke of her work on the EU funded ToxDrop project which is developing “**cell-on-a-chip technology**.” Each glass slide or chip holds hundreds of tiny white dots containing human cell cultures and enzymes, which mimic human reactions to potentially toxic compounds, and charts reactions over time. Once developed this method has the potential to replace the use of animals in toxicity screening.

Pioneering research being done at Kroto Research Institute, Sheffield uses **Tissue engineering** to develop a 3D **skin model**, growing human tissue on a 3D scaffold. In the future this could be used to replace animals in tests for skin corrosivity, and phototoxicity.

Other research conducted at Cardiff University, uses cells from human donors to form an artificial human airway. The potential applications of this include testing of aerosolised consumer products (pharmaceuticals, hairsprays) and airborne pollutants, without testing on animals.

Private companies are also investing heavily in developing alternatives to animal testing. UK based Kirkstall Limited is developing a “**bioreactor**” (a series of interconnected chambers for each cell type through which nutrients flow.) Pressure, temperature, Ph, flow rates can be controlled, and responses to potential toxins can be measured, without the use of animals.

Closing the in vitro – in vivo gap

It is clear, from the research presented to the conference that scientific progress can provide animal alternative, human relevant methods of testing. Yet this is just part of the equation. Before alternative methods can be used in the mainstream to replace animal testing, they have to undergo validation and regulatory acceptance. One important point repeated by several delegates is that regulatory bodies must keep up with alternatives as they become available, both in Europe¹ and elsewhere. Another point, crucial to speeding up acceptance of new alternative methods, is the involvement of industry, and the need for greater participation of industry in this process.

¹ On 22 May 08 Regulators were rebuked in the European Parliament for moving too slow, to accept validated alternatives.

New approaches to safety testing

The emerging science that is Nanotechnology has the potential to provide reduction and replacement methods, yet on the other hand there are concerns that the new nanoparticles may themselves necessitate even more animal testing. As a new technology, regulations covering safety testing are not yet in place, and it's clear there is a definite need for an approach that is mindful of the need to replace animal testing, in the safety testing of new nano-materials.

A number of speakers made this important point, including Dr Katy Taylor [BUAV] and Dr Nirmala Bhogal [FRAME]. Proposing frameworks that take into account the information required when assessing safety and the non-animal methods that could provide this data. This rationale could provide the basis of future guidelines for the regulatory testing of nanomaterials.

Timely, informative and highly relevant.

The conference organised by the Institute of Nanotechnology, brought together delegates from a wide variety of disciplines and viewpoints, and in doing so, provided an invaluable opportunity to discuss and debate approaches and viewpoints, early in the development of this new technology. The research presented to the conference offers real hope that given the right support humane scientific research, can become a reality.