

Dipartimento di Biotecnologie e Bioscienze – UNIMIB

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Towards 3Rs: use of alternative methods for the validation of biomedical and cosmeceutical nanodrugs

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Abstract: The use of animals in biomedical research is generally justified by the potential high advantage to the health of humans, other animals or environment. Nevertheless, ethical issues require scientists to limit animal employment in their research. That's why today 3Rs (Replacement, Reduction and Refinement) have become established worldwide as the ethical approach to governing animal-dependent science. According to 3Rs, alternatives methods have been improved in order to reduce or, wherever possible, to replace the use of animals, but also to limit their suffering.

Among alternative biological methods, 3D cells cultures are highly powerful since they can reproduce tissue complexity, provide good reproducibility and the material is virtually unlimited. Over the last years, different 3D cell models have been employed for the validation of drug candidates, including innovative nanomaterials for biomedical and cosmeceutical devices. In details, advanced cell models have been developed to determine the permeability of nanotherapeutics across the biological barriers, the therapeutic activity on pathological targets, but also to determine the safety profile of the newly designed nanoformulations.

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