

# Changing the change

Design Visions, Proposals and Tools

An international conference on the role and potential of design research in the transition towards sustainability

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Torino, 10th - 11th - 12th July 2008

Organised by Co-ordination of Italian Design Research Doctorates with  
Conference of Italian Design Faculty Deans and Programme Heads.

In the framework of WORLD DESIGN CAPITAL TORINO 2008 | © ICSID  
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## BIODESIGN RESPONDS TO A CHALLENGE

### Abstract

The relation between human body and the new technologies (micro and nano) is changing deeply and continually. It is essential to emphasise the need of developing an interdisciplinary approach amongst the different areas, their point of contact being, naturally, their interest in the human-being as a unicum and a complex entity. The design necessarily should drive these changes.

In the last twenty years, the impulse towards miniaturization allowed us to get over the "micro" barriers and to enter the "nano" field. A technological challenge that was stimulated by a rising demand for smaller and smaller machines. This research has been strongly supported by large economic investments from many industrialized countries.

The convergence of micro and nano-technologies (MNT) with biology guarantees exceptional progress and potential cost reductions for medical and health-care applications in general. The results of this research will provide the chance to discover unique systems for the future generation of medico-diagnostic Point-of-Care instrumentation (POC). Such results specifically need the integration of knowledges, processes and technologies as a transverse trend in the MNT's disciplines and dimensions. Together, with the arrival of intelligent environment, in which technology has become completely transparent, these advanced POC's solutions have to meet the requirements of a well-informed consumer. The user wants for functionality and performance, connecting opportunities and wider values towards health and personal wellbeing problems.

The research is directed toward a new phase, where the attention is on the functionality of the nano-structured materials and toward the creation of a new interdisciplinary sector, in which the various traditional disciplines are integrated.

It is necessary, for now, to get more researchers to participate in this multidisciplinary field, and that is the reason why the role of the industrial design is established.

A lot of researchers think that the time has come to create interdisciplinary programs about nano-technologies, in which the researchers will have to learn a new kind of scientific language that allows them to talk effectively and promote interdisciplinary capability recognized and legitimized in the proper disciplines.

The creation of interdisciplinary programs for all the disciplinary sectors has to give a strong push for the development of a scientific language that allows the designer to talk with competence with the other disciplines that participate in the planning of nano and micro technological devices.

In spite of the large number of project evidences, the consideration of industrial design about such research area was absent. And yet the evolution of micro and nano technologies opens an area of research and knowledge undoubtedly interesting and feasible by the industrial design.

The contribution of industrial design, in order to be innovative, will have to structure and analyse several intervention levels.

Into today's multicultural scientific context has been introduced a new discipline - Biodesign. Behind the main philosophical concept of Biodesign is the human body, considered as a *psycho-biological unicum*.

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Research activities, therefore, aim at developing artificial devices which can be fully integrated into the human body, or rather into the prosthetic human being.

The bio-designer, in an attempt to solve the medical-biological problems involved, makes use of industrial design methodologies, sharing experience with interdisciplinary teams.

Biodesign should not be considered as being merely design applied to medicine. It may, indeed be more exactly defined as an entirely new discipline, whose concepts of interdisciplinary approach and close cooperation with the medical-biological sciences are essential to its purposes.

The biodesign's research wants to develop an instrument that is able to support and guide the design process. It must give the designer not only the instruments used to analyze, evaluate and define requirements, performances and project solutions most suitable for the resolution of the single system, but also the chance to address himself in a conscious way to the bio-devices sector.

Naturally, medicine is not the only field where the advantages of this new approach are proved. But it's expected to be one of the most effective because of the deep involvement with several spheres of personality, far beyond considering a person only a patient or a user.

Moreover, such aspects of creativity in design become very clear and promising once the technology provides capabilities to interact with the human body at every level, even for total connection of implanted devices, for example. Hence, one of the main objectives for Biodesign is likely to identify the role of industrial design in the process of design and application of micro (MEMS) and nano-devices (NEMS) for bio-robotic and biomedical systems, setting and enhancing methodology and tools.

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