

Press release



ESSENCE project – Drug Development With Neuronal Stem Cells On Neurochips

Embryonic stem cell research and research into neuronal cell cultures on microelectrodes both date back to 1977. While most people have heard of embryonic stem cells, particularly in the light of the ethical debate surrounding the topic, public awareness that it is possible to cultivate neuronal cell cultures on microelectrode array neurochips, or MEA neurochips for short, is much lower. Scientists and engineers from Germany and Italy are now about to advance the integration of this technology in a joint European research project. Medical scientist Dr. Marcel Dihné and his group from the University of Düsseldorf, the Düsseldorf-based company Result Medical GmbH and the Rostock-based company NeuroProof GmbH will join forces with the Genoa-based company ETTsolutions s.r.l. and the group led by Prof. Sergio Martinoa at the University of Genoa. Dr. Dihné and his team have shown that electrically active neuronal cell cultures can be successfully grown on MEA neurochips using stem cells from mouse embryos. As part of the project he and his colleagues will grow various types of neuronal cell cultures, containing, for instance, dopaminergic cells, in an attempt to develop a model for research into Parkinson's disease. In a second step the group wants to make human IPS cells on MEA neurochips develop into neuronal networks with specific characteristics. IPS cells are adult stem cells obtained from human skin and are not subject to any legal restrictions. The commercial partners ETTsolutions s.r.l. and Result Medical GmbH are to develop new computing methods to evaluate the data obtained so as to enable the scientists to better interpret and understand the complex activity patterns of the cells. Professor Martinoa and NeuroProof GmbH will continue to refine the MEA neurochip technology and develop procedures to test toxic substances and pharmaceuticals. Up until now, NeuroProof GmbH has offered this technology as a service using primary neuronal cell cultures from mice. To this end it has established a database containing the electro-physiological efficacy profiles of over 100 substances.

Dr. Olaf Schröder, CEO of NeuroProof GmbH, made the following statement on the project: "We are looking forward to embarking on the ESSENCE project with a group of highly competent partners. The opportunity to cultivate human neuronal cells on our MEA neurochips may allow us to improve the predictability of the effect of new substances in the treatment of serious diseases of the central nervous system in unforeseen ways. This will allow our pharmaceutical industry customers to accurately judge the potential of their candidates for development at a much earlier stage."

The aim of the project is to be able to predict the effect of drugs or potentially toxic substances more accurately and reliably using the in-vitro test procedure. This will help significantly to reduce the unimaginably high costs of developing central nervous system drugs, of which only one in ten actually passes clinical trials, and in the end will lead to the more rapid availability of more effective drugs.

The 1.5 million Euro project is set to run for three years and is funded by the Eurotransbio (ETB) initiative as part of the European Commission's ERA-NET scheme.

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