

3D AD cell culture

3D cell culture as an in vitro model for drug screening in Alzheimer's disease

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Projektbeschreibung

Alzheimer 's disease (AD) is an irreversible neurodegenerative disease without a cure. Despite many years of research and investment there is not yet an effective treatment. During the years, research has been focused on 2D cell cultures and rodents as preclinical models providing great knowledge about the pathological mechanisms involved in AD but have not translated well to clinical research. It is becoming clear that new approaches to optimize preclinical studies are needed. Induced pluripotent stem cells (iPSCs) and three-dimensional (3D) cell culture are holding strong hopes as valuable preclinical models for neurodegenerative diseases. 3D cell culture is divided in scaffold-based and scaffold-free cell culture. Scaffold helps the culture to obtain a brain-like environment where neural and glial cells can be co-cultured forming a cell-cell interaction that in 2D cannot be observed. Scaffold-free 3D cell cultures are known as organoids, are self-organizing structures originating from iPSCs. Organoids can form organ-like structures. Cerebral organoids are holding a strong value for the study of neurodevelopmental stages. Combining iPSC-based systems with 3D cell culture models would be a considerable improvement for pathological and preclinical studies related to AD.

We will evaluate different 3D cell culture systems that will allow to select the best system as future preclinical model for the study of pathological mechanisms involved in AD. Furthermore, 3D cell culture will be established as an alternative for preclinical in vivo tests. Thus, validating a 3D cell culture model for AD research will open the door for future in vitro studies of neurodegenerative disorders and is intended to increase translatability of preclinical research.

Projektpartner

- Scantox Neuro GmbH