Abstracts of papers presented at the 2020 virtual meeting on

NEURODEGENERATIVE DISEASES: BIOLOGY & THERAPEUTICS

December 2–December 4, 2020

Arranged by

Aaron Gitler, Stanford University
Richard Ransohoff, Third Rock Ventures
Scott Small, Columbia University
Li-Huei Tsai, Massachusetts Institute of Technology

Cold Spring Harbor Laboratory
MEETINGS & COURSES PROGRAM
Inhibition of α-synuclein fibrillogenesis by diphenyl triazine hybrids—Design, synthesis and in-vitro efficacy studies
Joshna Gadhavi, Mudasir Maqbool, Pravin Hivare, Sharad Gupta, Nasimul Hoda.
Presenter affiliation: Indian Institute of Technology Gandhinagar, Gandhinagar, India.

Intravascular delivery of neural precursors improves memory impairment in mouse models of Alzheimer's disease
Nazaret Gamez Ruiz, Enrique Armijo Fuentes, Ruben Gomez Gutierrez, Claudio Soto, Ines Moreno Gonzalez.
Presenter affiliation: The University of Texas Health Science Center at Houston, Houston, Texas; Universidad de Malaga, Malaga, Spain.

ApoE4 disrupts insulin signaling in N2A neuroblastoma cells
Chase Garcia, Alexey Tomilov, Gino Cortopassi.
Presenter affiliation: UC Davis School of Veterinary Medicine, Davis, California.

Human pluripotent stem cells as a research tool for elucidating the role of glial cells in Alzheimer’s disease
Juan Antonio Garcia Leon, Laura Caceres Palomo, Jose Carlos Davila, Javier Vitorica, Antonia Gutierrez.
Presenter affiliation: University of Malaga/IBIMA/CIBERNED, Malaga, Spain.

Quantitative analysis of early endosome pathology in young and aged Ts65Dn mice following maternal choline supplementation (MCS) using 3D reconstructed z-stacks
Presenter affiliation: Nathan Kline Institute, Orangeburg, New York; NYU School of Medicine, New York, New York.

Can zebrafish (Danio rerio) produce amyloid beta peptide?
Expressing tagged forms of Appa and Appb in vivo
Ewan Gerken, Morgan Newman, Michael Lardelli.
Presenter affiliation: Alzheimer's Disease Genetics Laboratory, Adelaide, Australia.
HUMAN PLURIPOTENT STEM CELLS AS A RESEARCH TOOL FOR ELUCIDATING THE ROLE OF GLIAL CELLS IN ALZHEIMER’S DISEASE

Juan Antonio García León1*, Laura Caceres Palomo1*, José Carlos Dávila1, Javier Vitorica2, Antonia Gutiérrez1#

1University of Malaga/IBIMA/CIBERNED, Cell Biology, Genetics and Physiology, Málaga, Spain, 2University of Seville/IBiS/University Hospital Virgen del Rocío/CSIC/CIBERNRED, Biochemistry and Molecular Biology, Seville, Spain
*First authors
#Corresponding authors

Background:
Alzheimer's disease (AD) is characterized by presenting a complex pathology, not fully resolved yet. This fact, together with the lack of reliable models, has impeded the development of effective therapies. Recently, several studies have shown that functional glial cell defects have a key role in the pathology of AD. However, this glial dysfunction, currently, cannot be correctly modeled using the available animal models, so we hypothesized that cells derived from Alzheimer's patients can serve as a better platform for studying the disease. In this sense, human pluripotent stem cells (hPSC) allow the generation of different types of neural cells, which can be used for disease modeling, identification of new targets and drugs development.

Methods:
We have a collection of hiPSCs derived from patients with sporadic forms of AD. We have differentiated these cells towards neural lineage to obtain neurons and astrocytes. For the generation of oligodendrocytes (OLs), we have developed a fast and robust protocol to generate mature OLs in just 22 days.

Results:
We have generated neural precursors from all the lines tested. In the case of OLs, the cells generated resemble primary OLs and can myelinate neurons in vivo and in vitro using a screening compatible platform. This platform is being transferred for the generation of the other glial cells.

Conclusions:
This methodology can be used to elucidate the pathogenic pathways associated with neurodegeneration and to identify new therapeutic targets susceptible to modulation, contributing to the development of new effective drugs against AD.

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