CD49f – A NOVEL CELL SURFACE MARKER

NYSCF The New York Stem Cell Foundation Research Institute

NOVEL MARKER FOR FUNCTIONAL ASTROCYTE PURIFICATION

FUNCTIONAL ASTROCYTES DERIVED FROM PLURIPOTENT STEM CELLS AND METHODS OF MAKING AND USING THE SAME

PATENT PENDING

Patent Cooperation Treaty (PCT)

LEARN MORE

WO/2020/243618 (WO)

NYSCF PAPER

CD49f is a Novel Marker of Functional and Reactive Human iPSC-Derived Astrocytes.

Neuron. 2020.

CONTACT US

partnering@NYSCF.org

Overview

Astrocytes play crucial roles in central nervous system (CNS) homeostasis and are implicated in pathogenic mechanisms of neurological diseases. However, few studies exist that identify markers for astrocyte isolation. The advent of human induced pluripotent stem cell (hiPSC) technology has made it possible to generate patient-specific astrocytes and CNS cells using protocols developed by the New York Stem Cell Foundation Research Institute (NYSCF Research Institute) and others. These protocols serve as valuable mechanisms for generating disease models. Nonetheless, isolating astrocytes from primary specimens from *in vitro* mixed cultures remains challenging.

Technology Summary

The present invention relates generally to cell culture, and more particularly to a composition and method for generating astrocytes. Researchers at the NYSCF Research Institute have identified and developed efficient methods for isolating astrocytes by selection of a new cell surface marker, CD49f. CD49f has been identified to isolate astrocytes in cultures of hiPSC-derived brain cells, including organoids. CD49f, a marker for positive selection of astrocytes, facilitates future research on human astrocyte biology, elucidating their regulation/dysregulation in disease.

Inventor Profile

Dr. Valentina Fossati, Ph.D., is a Senior Research Investigator at the NYSCF Research Institute. Dr. Fossati oversees the multiple sclerosis (MS) research program and is focused on novel treatments for the progressive forms of MS. Dr. Fossati obtained her Ph.D. in 2008 from the University of Bologna and relocated to New York, at Mount Sinai School of Medicine, as a visiting student during her Ph.D. to continue as a NYSCF-Druckenmiller postdoctoral fellow. Bringing stem cell expertise to the MS field, Dr. Fossati developed a research plan focused on modeling MS with hiPSC-derived cell types, understanding genetic susceptibility by studying patient-specific cells and, ultimately, drug discovery and cell replacement therapies to promote neuroprotection and remyelination. Dr. Fossati's group generated iPSC lines from MS patients and is currently developing co-culture systems including neurons, oligodendrocytes, astrocytes and microglia to dissect the role of each cell type in the progression of the disease.