In Motion

Highlighting Articles Advancing Pain Research in Canada and the World

Featured article:

Hildebrandt MR, Reuter MS, Wei W, Tayebi N, Liu J, Sharmin S, Mulder J, Lesperance LS, Brauer PM, Mok RSF, Kinnear C, Piekna A, Romm A, Howe J, Pasceri P, Meng G, Rozycki M, Rodrigues DC, Martinez EC, Szego MJ, Zúñiga-Pflücker JC, Anderson MK, Prescott SA, Rosenblum ND, Kamath BM, Mital S, Scherer SW, Ellis J. (2019). **Precision Health Resource of Control iPSC Lines for Versatile Multilineage Differentiation.** Stem Cell Reports, 13, 1126-1141. doi: 10.1016/j.stemcr.2019.11.003

Key insights from the study:

- **High-Quality Stem Cells:** Researchers developed high-quality stem cells from healthy volunteers. These cells are crucial for studying a variety of diseases and can help researchers understand complex health conditions.
- **Versatile Cell Types:** The stem cells were successfully transformed into different cell types, including brain cells, heart cells, and liver cells. Notably, they also created primary sensory neurons, which can be used to explore chronic pain mechanisms and potential treatments.
- **Genetic Analysis:** Whole-genome sequencing of these stem cells revealed genetic variations. This information is essential for selecting the most suitable cells for studying various diseases, ensuring accurate and reliable results in research.

CPN
CHRONIC PAIN NETWORK

Quick Article Link: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6915802/

What happened?

Researchers used precision health techniques to develop a collection of high-quality stem cells from four healthy people. These stem cells were reprogrammed and tested for their ability to transform into different types of cells. The cells were successfully turned into brain, heart, and liver cells. Other researchers demonstrated the versatility of these stem cells by creating kidney mini-organs, immune cells, and nerve cells. Genetic analysis of these cells helped identify variations, ensuring the selection of the best control cells for disease research.

Why is it important?

Using well-characterized stem cells as controls is crucial for accurate disease research. These standardized stem cells ensure consistent and reliable results in various studies. The genetic information of these cells helps researchers select the most suitable controls for their experiments, especially for complex diseases with multiple genetic factors.

What now?

This study shows that these well-characterized stem cell lines can be broadly applied by the disease research community. Expanding this collection and exploring the identified genetic variations further will enhance its utility in disease modeling. In particular, these stem cells can be differentiated into sensory neurons, which play a key role in pain perception. By studying these neurons, researchers can model chronic pain conditions, explore underlying mechanisms, and develop targeted therapies. This research opens new pathways for understanding and treating chronic pain, especially in patients with complex or nerve-related pain syndromes. Ongoing research will contribute to the broader understanding of disease mechanisms and the development of new treatments.