Biochemistry and Molecular Biology Journal
ISSN: 2471-8084

Open access Commentary

In Vitro Separation and Growth of Schwann Cells

Nathaniel C. Gilbert*

Department of Biochemistry, The University of Chicago, USA

DESCRIPTION

Changes Schwann cells are glial cells from the peripheral nervous system. They have several different subtypes and function in different ways in nerves. They can be derived from and cultured *in vitro* for use in tissue engineering and disease modelling applications. Since it is challenging to get significant numbers of primary human Schwann cells, *in vitro* differentiation from other cell types is an option. The understanding of the developmental signaling systems that regulate the differentiation of Schwann and neural crest cells *in vivo* is first discussed. Next, a complete presentation of the findings on the *in vitro* differentiation of Schwann cells from multipotent stem cell sources is made. Contextualization and discussion of the pertinent signalling pathways and compounds employed frequently in those methods.

With an emphasis on studies using hESC and hiPSC, several procedures for cell sources, differentiation tactics, cell characterization, and protocol effectiveness are discussed and contrasted. An overview of recent advancements in the differentiation and three-dimensional culture of Schwann cells is given. This contribution, in brief, helps the comparison and improvement of protocols, gives an overview of the available tools and methodologies for the differentiation of Schwann cells, and aids in the selection of approaches that are suitable for specific applications.

Schwann cells, the most prevalent form of nerve cells in the peripheral nervous system, are the well-studied type of peripheral glia cells. The regulation of sensory perception, synaptic communication, and the immune response are just a few of the additional functions of Schwann cells that have been discovered despite the fact that they are best known for wrapping myelin sheaths around peripheral axons.

However, several of these methods still have limitations, such as poor differentiation efficiency, unpredictable repeatability, or insufficient cell maturity of the generated cells. The current understanding of the embryonic development of the Schwann cell lineage and the underlying molecular determinants serves as the foundation for this literature review, which provides a thorough overview of the differentiation methods and protocols available to derive Schwann cells *in vitro* from various multipotent cell sources, with a focus on hiPSC/hESC. It compares and explains the mechanics, advantages, and downsides of the protocols and gives an overview of characterization methods and standards. It also gives a brief summary of recent advancements and techniques in the field of 3D cell culture of Schwann cells, which is a quickly growing one.

As a result, *in vitro* differentiation techniques that start with iPSC or ESC often consist of two phases: Induction of neural crest identity, and differentiation to the Schwann cell lineage. The targeted regulation of cell differentiation in a dish can only be as exact as our present comprehension of the signalling processes involved; therefore the differentiation protocols adapt and improve as new insights into the *in vivo* developmental stage emerge. However, despite the fact that the majority of our understanding is based on findings from animal models, we still don't fully understand how Schwann cells form. Because the mechanisms governing Schwann cell formation in human cells may be distinct from those in animal cells, hiPSC has allowed researchers to examine this topic more completely.

ACKNOWLEDGEMENT

The authors are grateful to the journal editor and the anonymous reviewers for their helpful comments and suggestions.

DECLARATION OF CONFLICTING INTERESTS

The authors declared no potential conflicts of interest for the research, authorship, and/or publication of this article.

Received:	01-November-2022	**Manuscript No:**	IPBMBJ-22-15078
Editor assigned:	03-November-2022	**PreQC No:**	IPBMBJ-22-15078 (PQ)
Reviewed:	17-November-2022	**QC No:**	IPBMBJ-22-15078
Revised:	22-November-2022	**Manuscript No:**	IPBMBJ-22-15078 (R)
Published:	29-November-2022	**DOI:**	10.36648/2471-8084-8.11.102

Corresponding author Nathaniel C. Gilbert, Department of Biochemistry, The University of Chicago, USA, E-mail: nathaniel722@gmail.com

Citation Gilbert NC (2022) *In Vitro* Separation and Growth of Schwann Cells. Biochem Mol Biol J. 8:102.