

It takes a lot of nerve: Scientists make cells to aid peripheral nerve repair

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Scientists at the University of Newcastle, UK, have used a combination of small molecules to turn cells isolated from human skin into Schwann cells - the specialised cells that support nerves and play a role in nerve repair. This new method generates large and pure populations of Schwann cells and hence is a promising step forward for the repair of peripheral nerve injuries. This research has just been published in the scientific journal *Development*.

Currently, nerve repair strategies involve taking grafts from patients and using these to repair their damaged peripheral nerves but this approach has several disadvantages and can often itself cause nerve damage. Now, Motoharu Sakaue together with Maya Sieber-Blum, Professor of Stem Cell Sciences at the Institute of Genetic Medicine in Newcastle, investigated the possibility of making Schwann cells, which are known to promote nerve repair. To make these cells, the researchers isolated [stem cells](#) from adult skin and coaxed them into Schwann cells by exposing them to small molecules.

"We observed that the bulge, a region within hair follicles, contains [skin stem cells](#) that are intermixed with cells derived from the neural crest - a tissue known to give rise to Schwann cells. This observation raised the question whether these neural crest-derived cells are also stem cells and whether they could be used to generate Schwann cells" said Sieber-Blum.

"We then used pertinent [small molecules](#) to either enhance or inhibit pathways that are active or inactive, respectively, in the embryo during Schwann cell differentiation" she said.

Using this approach, the scientists were able to generate large and highly pure populations of human Schwann cells. These cells exhibited a morphology that is characteristic of Schwann cells and also expressed relevant Schwann cell

markers. The researchers further tested the functionality of these Schwann cells, showing that they could interact with nerves in vitro. "The next step is to determine, for example in animal models of [peripheral nerve injury](#), whether grafts of these Schwann cells are conducive to [nerve repair](#)" say the authors.

This study identifies a biologically relevant and accessible source of cells that could be used for generating sufficient quantities of Schwann cells and thus offers great potential in the repair of peripheral nerve injuries.

More information: Sakaue, M. and Sieber-Blum, M. (2015). Human epidermal neural crest stem cells as a source of Schwann cells. *Development*, DOI: [10.1242/dev.123034](https://doi.org/10.1242/dev.123034)

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