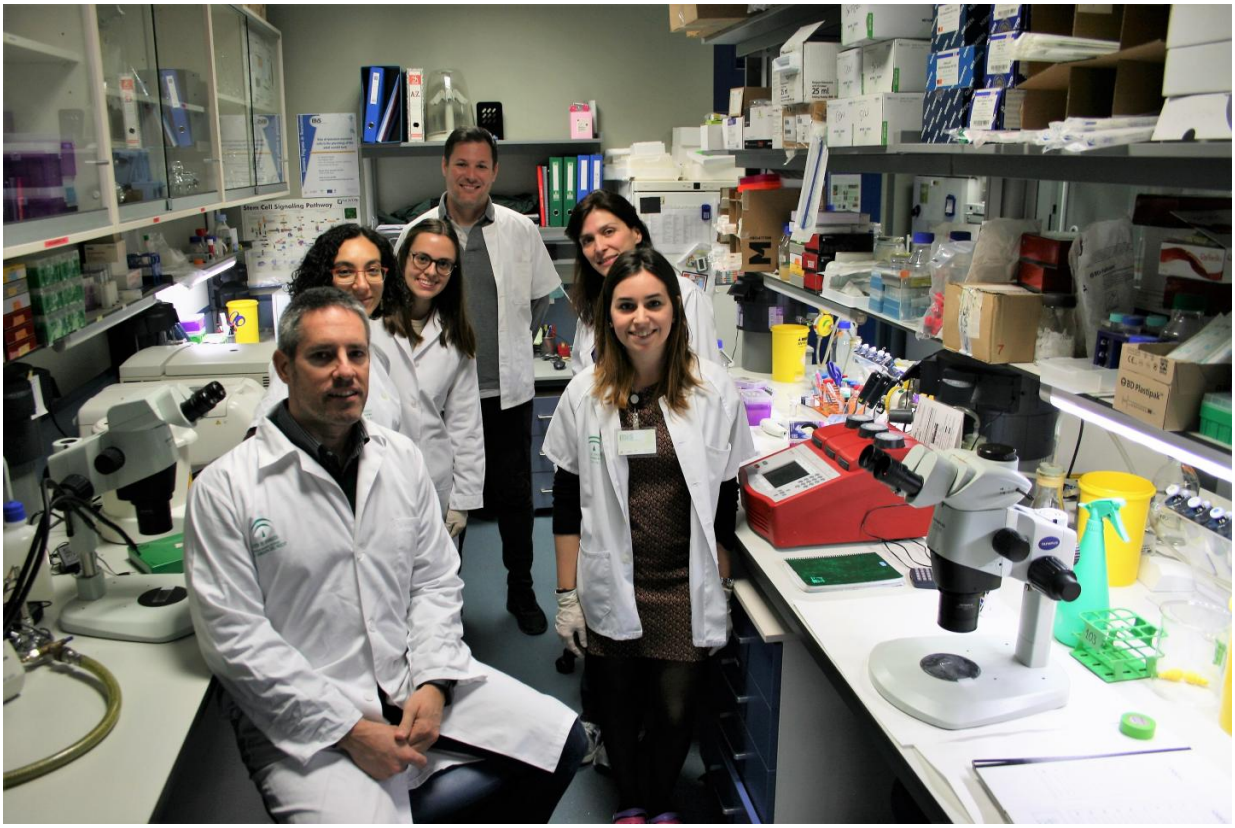
Team discovers neural stem cells can become blood vessels

May 19 2017



Professor Ricardo Pardal and his team. Credit: University of Seville

Mother cells from the adult carotid body can transform into blood vessels as well as neurons. This discovery could have important repercussions on the treatment of such diseases as pediatric tumors and

Parkinson's.

Researchers from the University of Seville and the Seville Institute of Biomedicine (IBiS) have just published a scientific article in the journal *Cell Reports*, in which they show that mother cells from the adult carotid body can transform into blood vessels, as well as into neurons. The work was led by the post-doctoral researcher Valentina Annese.

"We believe that the ability to produce blood vessels from neural stems cells could directly affect the growth of certain types of tumours on the infant population," said the project's main researcher, Ricardo Pardal.

The carotid body is a small structure of nerve tissue situated at the fork of the carotid artery. Its function is to act as a chemoreceptor in the blood. It monitors oxygen pressure in the blood and plays a role in the regulation of breathing.

The plasticity of adult mother cells, or the somatic mother cells, to cross boundaries and to differ in unrelated cell types has been a subject of debate over the last decade. Neural crest stem cells (NCSCs) show notable plasticity during their development, but it is not known if adult NCSCs maintain this plasticity.

"We find that the adult stem cells from the carotid body taken from the neural crest (CBSCs) are capable of experiencing endothelial differentiation, as well as their already described role in neurogenesis, contributing to both neurogenic and angiogenic processes that take place during acclimation to hypoxia. In addition, the conversion of CBSCs into blood vessels is dependent on the hypoxia-inducible factor (HIF) and is sensitive to vascular cytokines released in hypoxia, such as erythropoietin. Our data highlights a notable physiological plasticity in an adult population of stem cells specifically from tissue, and they could have an impact on the use of those cells for cellular therapy," Pardal

said.

More information: Valentina Annese et al, Physiological Plasticity of Neural-Crest-Derived Stem Cells in the Adult Mammalian Carotid Body, *Cell Reports* (2017). DOI: 10.1016/j.celrep.2017.03.065

Provided by University of Seville