



Press release | January 16, 2019

Behavioural experiments confirm: Increasing the generation of neurons boosts brain function

Scientists from TU Dresden search for new methods to cure neurodegenerative diseases.

Most of the neurons in the human brain are generated from neural stem cells during embryonic development. After birth, a small reservoir of stem cells remains in the brain that keeps on producing new neurons throughout life. But, do these new neurons contribute to brain function? And if so, could we improve brain capacities by increasing their number? The research group of Prof. Federico Calegari at the Center for Regenerative Therapies Dresden (CRTD) of TU Dresden has answered those questions, now published in the renowned EMBO Journal.

In their latest study, the scientists analysed adult and healthy mice in which the small reservoir of stem cells was manipulated in order to increase in number. As a result, the number of neurons generated from these stem cells also increased. In mice, these neurons mainly populate the brain area responsible for interpreting odours. In fact, olfaction is one to the most powerful senses in mice, fundamental for finding food and escape predators. As powerful as the sense of smell naturally is in mice, in the following behavioural experiments the scientists found that mice with more neurons were able to discriminate extremely similar odorants that normal mice failed to distinguish. Hence, this study is fundamental in proving that stem cells can be used to improve brain function.

“Evolution gave mice an extremely sensitive olfactory system. It is amazing that by adding few neurons we could improve something that seemed already close to perfection”, states Prof. Federico Calegari. “This study sets the basis for our research, which now is focused on finding out whether we could apply our strategy as a therapeutic approach in neurodegenerative models.”

The CRTD at the TU Dresden is academic home for scientists from more than 30 nations. Their mission is to discover the principles of cell and tissue regeneration and leveraging this for recognition, treatment and reversal of diseases. The CRTD links the bench to the clinic, scientists to clinicians to bring expertise in stem cells, gene-editing and regeneration towards innovative therapies for neurodegenerative diseases such as Alzheimer's and Parkinson's disease, haematological diseases such as leukaemia, metabolic diseases such as diabetes, retina and bone diseases. The group of Prof. Federico Calegari focus on mammalian neural stem cells in the context of development, evolution and cognitive functions.

This study was financed by the TU Dresden / CRTD, DFG German Research Foundation and the Human Frontiers Science Program. It performed in collaboration with the Heidelberg University, Gutenberg University Mainz and King's College London and was supported by the Center for Molecular and Cellular Bioengineering (CMCB) of TU Dresden.

Publication:

<http://emboj.embopress.org/content/early/2019/01/03/embj.201798791>

Further media inquiries:

Dr. Sara Bragado Alonso

Tel: +49 (0) 351 463 82231

Email: sara.bragado_alonso@tu-dresden.de

Webpage: www.crt-dresden.de

Photos:

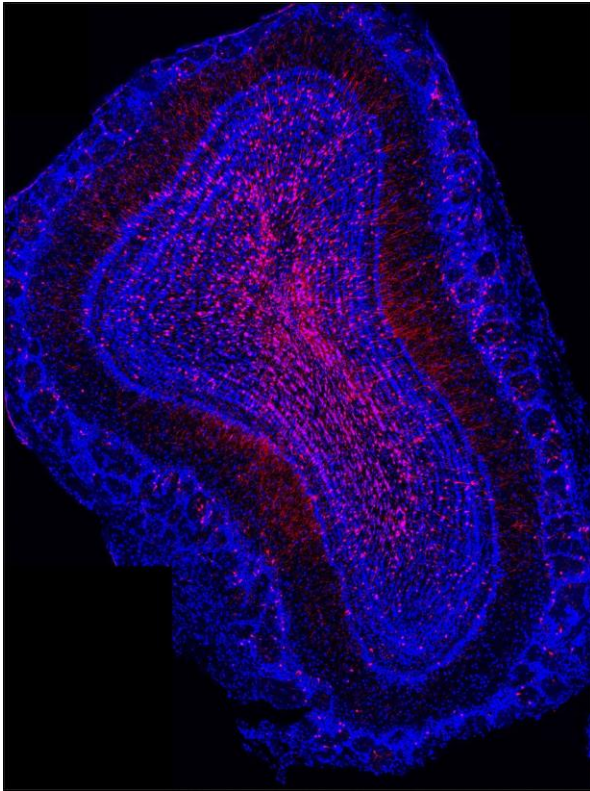


Image of the extra neurons (in red) artificially generated in the olfactory bulb, the brain area responsible for interpreting odors © CRTD



Dr. Sara Bragado Alonso and Prof. Federico Calegari published a new study on neurons © CRTD