

Hence Proved, Human Brains Are Not Just Enlarged Mouse Brains; “Rosehip Neurons” the Unique Brain Cell in Cerebral Cortex That Makes Us Human

Divya, R.¹, Rajajeyakumar, M.^{2*} & Ashok, V.³

¹Assistant Professor, Department of Physiology, Karpagam Faculty of Medical Sciences and Research, Coimbatore, India

²Assistant Professor, Department of Physiology, Trichy SRM Medical College Hospital & Research Centre, Trichy, India

³Assistant Professor, Department of Biochemistry, Karpagam Faculty of Medical Sciences and Research, Coimbatore, India

***Correspondence to:** Dr. Rajajeyakumar, M., Assistant Professor, Department of Physiology, Trichy SRM Medical College Hospital & Research Centre, Trichy, India.

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Rosehip Neurons

An international group of scientists reported a rosy discovery. They found a new neuron which was never described before. What makes it unique is that these neuronal brain cell with its exclusive gene expressions, idiosyncratic shape and assorted networks was not described before and now in mice [1].

“Why the Name Rosehip”

The axonal boutons of rosehip neurons appeared like the large ‘rosehip’ and has compact arborization. It is called as rosehip neurons because, the dendrites in these brain cells, are condensed with lots of subdivisions along the branching points. Since all this feature gives it a thick bushy look which kind of makes it appear like a rosehip, that’s why they are termed as rosehip neurons by the scientists [2].

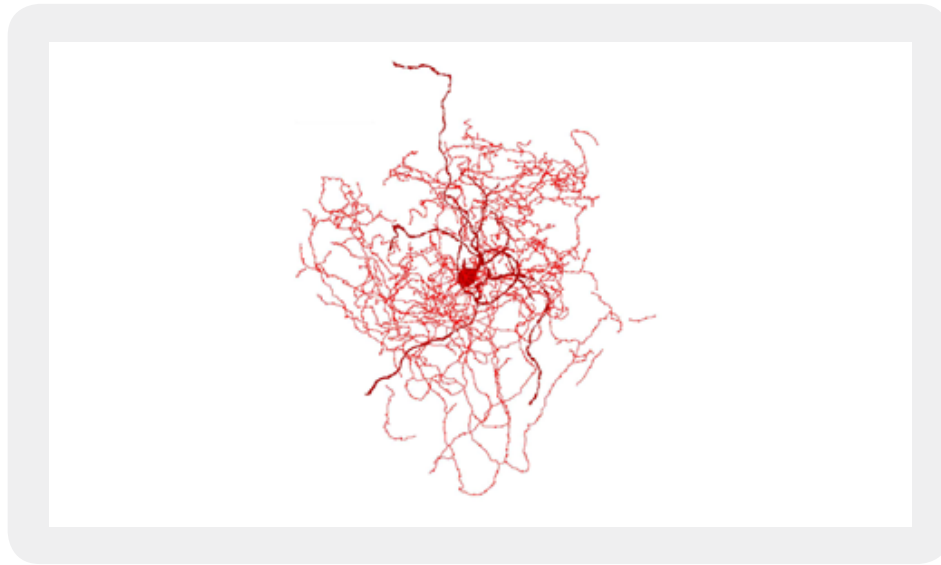


Figure 1: A digital reconstruction of a rosehip neuron. (Tamas Lab/University of Szeged)

Rosehip Neurons: Man vs Mice

These Rosehip neurons belong to GABAergic inhibitory neuron subtypes found in the human cerebral cortex. The RNA sequencing studies conducted by the scientists identified ten subtypes of GABAergic interneurons with a combination of gene signatures in human cortical layer 1. This exemplifies a cluster of human interneurons with anatomical features not ever described in rodents (mice). The immunohistochemical profile (GAD1+CCK+, CNR1-SST-CALB2-PVALB-) of these rosehip neurons demonstrates identical single transcriptomically demarcated cell type with a specific molecular marker signature which is not seen in mouse cortex [1].

Where Do We Find Rosehip Neurons?

Rosehip brain neuronal cells are located in the in layer 1 of cerebral cortex of human beings. These neurons extend intrinsic connections with apical dendritic shafts of layer 3 pyramidal neurons by forming homotypic gap junctions [1].



Figure 2: An image of a rosehip neuron (top) and a connecting pyramidal cell (bottom). (Tamas Lab/University of Szeged)

Actions of Rosehip Neurons

They form extensive connections with the pyramidal neurons in layer 3. By means of forming homotypic gap junctions with the apical dendritic shafts of pyramidal neurons, these rosehip neurons inhibit backpropagating action potentials in the dendrites of pyramidal neurons. These neurons function as a powerful indigenous regulator of distal dendritic transmission in pyramidal neurons of cortex [1].

What's Next?

Scientists will be looking for these neurons in brain samples of patients with neuropsychiatric and neurodegenerative disorders. Further animal research is essential for the evaluation, whether these neurons are present in the vertebrates, which may signify the evolutionary anthropological basics between man and his ancestors.

Bibliography

1. Boldog Eszter, Bakken Trygve, E., Hodge Rebecca, D., Novotny Mark, Aevermann Brian, D., Baka Judith, Bordé Sándor, et al. (2018). Transcriptomic and morphophysiological evidence for a specialized human cortical GABAergic cell type. *Nature Neuroscience*, 21(9), 1185-1195.
2. McRae Mike (2018). *Scientists Have Found a New Type of Brain Cell And It Looks Like It's Unique to Humans*. Science Alert.

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