

# New molecular barcoding tool shows excitatory and inhibitory neurons have common progenitors

December 29 2021, by Bob Yirka

---



Credit: Pixabay/CC0 Public Domain

A team of researchers at the University of California at San Francisco has developed a new molecular barcoding tool to study cell-type output of radial glia subtypes. In their paper published in the journal *Nature*,

they describe how the tool was made and how they used it to learn something new about progenitor cells involvement in growth of cortical neurons.

In mammals, the [cerebral cortex](#) is made up of two main kinds of cells—neuronal and non-neuronal cell types. And, the neuronal cells are further divided into two main categories based on their neurotransmitters and their function—excitatory neurons and interneurons. Prior research has shown that in mice, these two types of cells develop from two independent progenitors—and it was thought that was likely the case for humans as well, though there had been some study outcomes that suggested otherwise. In this new effort, the researchers have found strong evidence suggesting that things are very different with primates—the [neuronal cells](#) share progenitors.

In their effort, the researchers sought to find a new way to learn more about cell-type output of radial glia subtypes and wound up developing a new tool. They started by combining well established lineage-tracing methods with high-throughput sequencing techniques. They then built a library consisting of labeled cells and their progeny using fluorescent markers and by giving each cell a unique barcode that they transcribed into its messenger RNA. Then, they used their tool to "infect" sample radial glia with the barcodes. The idea was that the tool could be used to trace lineage relationships and the cell types involved. After several weeks, they studied the test cells to see what had transpired.

They found, much to their surprise, that interneurons had been sharing the added barcodes with excitatory neurons, which strongly suggested the two were sharing a common origin. To confirm their suspicions, they conducted single-cell transcriptomics on the cells and found that not only were their suspicions correct but that cortical progenitors had generated two kinds of interneuron sub-types—one similar to olfactory bulb interneurons and the other cortical interneurons. Further testing showed

similar types of relationships with other types of nerve [cells](#).

**More information:** Ryan N. Delgado et al, Individual human cortical progenitors can produce excitatory and inhibitory neurons, *Nature* (2021). [DOI: 10.1038/s41586-021-04230-7](https://doi.org/10.1038/s41586-021-04230-7)

© 2021 Science X Network

Citation: New molecular barcoding tool shows excitatory and inhibitory neurons have common progenitors (2021, December 29) retrieved 4 February 2024 from <https://medicalxpress.com/news/2021-12-molecular-barcoding-tool-excitatory-inhibitory.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.