

Engineering a Brain-Seeking Cell Line

How researchers transformed E0771 into E0771.Br — and why every step mattered

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When researchers at the Zhang Lab selected the [E0771](#) breast cancer cell line from CH3 Biosystems as their starting material, they knew they needed more than a standard cell line. They needed a precision instrument — one that would reliably seek out the brain and glow red when it got there.

Step 1: In Vivo Selection

Standard [E0771](#) cells, excellent as they are, do not reliably colonize the brain on their own. The solution was elegant: let biology do the selection. The researchers injected the original CH3 Biosystems [E0771](#) cells into mice and then specifically harvested only those cells that had successfully established in the brain — creating the E0771.Br line.

This approach amplifies the natural subpopulation best adapted for brain colonization. The result is a cell line that behaves in mouse brains the way metastatic breast cancer cells behave in human brains — reliably, consistently, and with a biologically realistic timecourse.

Step 2: Fluorescent Labeling with mCherry

With E0771.Br established from the original [E0771](#) stock, the team used lentiviral transduction to permanently tag the cells with mCherry — a bright red fluorescent protein. Tumors formed by these cells glow red under a fluorescence stereoscope, allowing every metastatic lesion to be instantly visible and countable at each experimental endpoint.

Why This Dual Modification Made the Study Possible

Brain tropism (from in vivo selection of [E0771](#)) gave reliable, consistent tumor formation. Optical visibility (from mCherry) gave unambiguous tumor quantification. Together — built on a documented, quality-controlled [E0771](#) stock from CH3 Biosystems — these modifications created a research-grade tool that powered every major finding in the Cell Reports paper.

Coming up in Part 3: The experiment itself — how gut dysbiosis was induced, how [E0771.Br](#) cells were injected, and how CITE-seq mapped the immune response.

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