

Building the blood-brain barrier

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Construction of the brain's border fence is supervised by Wnt/b-catenin signaling, report Liebner et al. in *The Journal of Cell Biology*.

Like many a modern nation, the brain requires tight border security to maintain levels of nutrients and keep out toxic substances. The blood–brain barrier (BBB) is a virtually impermeable network of tight junctions between endothelial cells that prevents paracellular flow of materials. Because Wnt/b-catenin signaling is a major pathway regulating other aspects of brain development, the authors examined its potential role in constructing the BBB.

In brain endothelial cells, Wnt signaling was active during the time of maximum vascular development, but not after the BBB matured. Activation of the Wnt signaling pathway in vivo and in vitro promoted BBB development, and inactivation prevented it. In vitro increasing Wnt signaling also strengthened junctions between non-brain endothelial cells.

This suggests that Wnt signaling might be tweaked to mend the BBBs in patients where it has failed—such as in stroke—or to temporarily open the BBB to deliver drugs that would normally be shut out.

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