



## Blood-Brain Barrier Model

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**WARF: P06318US02**

Inventors: Eric Shusta, Clive Svendsen, Christian Weidenfeller

**The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a simpler, more reproducible *in vitro* model of the blood-brain barrier for drug screening.**

### Overview

Accurately reproducing the blood-brain barrier in an *in vitro* setting has been a longstanding challenge. Current methods require the independent isolation of multiple cell types, and the quality of these preparations varies.

### The Invention

UW-Madison researchers have developed a simpler, more reproducible *in vitro* model of the blood-brain barrier. Most existing models include primary brain microvasculature endothelial cells (BMECs), which form the blood-brain barrier *in vivo*, and the corresponding primary astrocytes, which affect the barrier. The improved model consists of primary BMECs on a permeable membrane support. Embryonic neural progenitor cells (NPCs), which can be stimulated to differentiate into each of the major brain lineages that help govern the blood-brain barrier, are co-cultured with the BMECs.

Adding differentiating NPCs to the BMEC model results in more realistic and *in vivo*-like properties, including increased trans-endothelial electrical resistance, reduced permeability and rearranged tight junctions. Alternatively, NPCs that have differentiated into a mixture of astrocytes, neurons and oligodendrocytes can be co-cultured with the BMECs to “tune” the model for specific applications.

### Applications

- Drug screening

### Key Benefits

- More accurately predicts *in vivo* behavior than current models, including astrocyte co-culture
- Less labor intensive than current models
- Reproducible and reliable
- Because embryonic NPCs are easily isolated and expand rapidly, a large, relatively homogeneous cell stock can be obtained.
- NPCs survive cryopreservation, making possible multiple uses of the same NPC stock over a long period of time.
- The relative percentages of neurons and astrocytes differentiated from NPCs can be controlled to create designer mixtures of brain cells that can be co-cultured with the BMECs.

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**For More Information About Our Research:**

- [Eric Shusta](#)

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**WARF**  
Wisconsin Alumni Research Foundation

| [info@warf.org](mailto:info@warf.org) | 608.960.9850

## Tech Fields

- [Drug Discovery & Development : Disease models](#)
- [Drug Discovery & Development : Preclinical testing](#)

For current licensing status, please contact Jennifer Gottwald at [jennifer@warf.org](mailto:jennifer@warf.org) or 608-960-9854

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