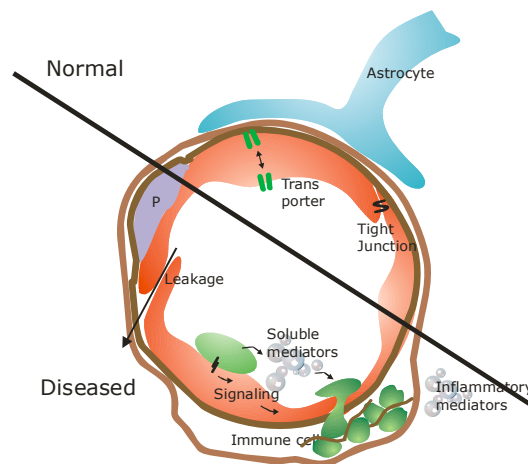


## Research group Blood-brain barrier Elga de Vries

The blood-brain barrier is comprised of specialized cerebral endothelial cells which form a physical and molecular barrier that hinders trafficking of immune cells and blood components into the brain. Brain endothelial cells are connected through complex tight junctions that limit entry of serum proteins and immune cells into the brain. Specific efflux pumps at the brain endothelium drive exclusion of unwanted compounds from the brain enabling multi-drug resistance, thereby protecting the brain. Vice versa, essential nutrients reach the brain through specific transporters. Barrier function is maintained by close contact with astrocytes (see Figure)



A chronic reduction of cerebral blood flow and dysfunction of the barrier occurs during ageing and failure of the barrier function may underlie numerous neurological disorders, such as multiple sclerosis, stroke, and dementia. Impaired barrier function will result in the unwanted entry of harmful compounds into the brain and immune cell migration, causing tissue damage.

To study mechanisms of neurological disorders, we have validated in vitro (rodent and human) and in vivo models including advanced (magnetic resonance) imaging approaches available for our research questions. Using post-mortem material of patients with multiple sclerosis, dementia or stroke, we are able to verify our findings in a disease setting. Current research topics within the group are the identification of mechanisms of regulation of blood-brain barrier function and neuroinflammation, in particular the effect of oxidative stress, are being explored in order to identify targets to limit neurological disorders.

### Group members:

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