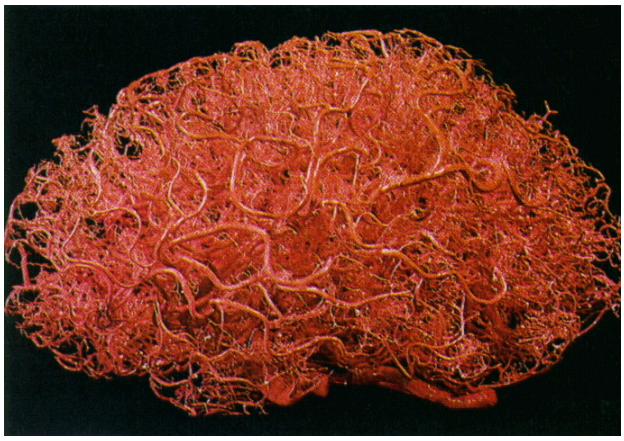
To understand what Blood-Brain Barrier (BBB) really is, it is perhaps best to describe the experiment that led to its discovery. In 1904 Paul Ehrlich injected an animal with certain dye intravenously and found that the dye stained all the organs apart from the brain and spinal cord. Some years later, his student Edwin E. Goldmann injected the same dye into the spinal cord – now the brain and the spinal cord became stained, while all other organs remained unchanged. They concluded that brain capillaries must act as a barrier to prevent blood-borne substances entering the brain. Indeed, in the 60s, the advent of electron microscope confirmed their hypothesis – the cells that form BBB form a very tight seal, blocking the passage of dyes and many other molecules into the brain.

In the body, the blood vessels carry blood from the heart to the tissues and back to the heart. Arterial blood brings water, oxygen and nutrients to minuscule blood vessels called **capillaries** in tissues where they are exchanged for metabolic and other waste products. In most tissues, capillaries let a wide range of substances through. However, the central nervous system (CNS) is extremely sensitive to a great number of molecules that are otherwise readily metabolized and excreted without causing harm to the peripheral organ system. Therefore, the capillaries that "feed" the brain (BBB) must shield the central nervous system from these harmful molecules. In doing so, their walls don't allow passage of a wide range of substances: everything that goes in and out of the CNS is very strictly regulated. This presents a problem when we try to introduce to the CNS new drugs designed to treat brain tumours or diseases such as lysosomal storage diseases.

Dr Svetlana Drndarski, Blood-Brain Barrier Group, Kings College, London



Zlokovic & Apuzzo, Neurosurgery 43(4), 877-878 (1998)