



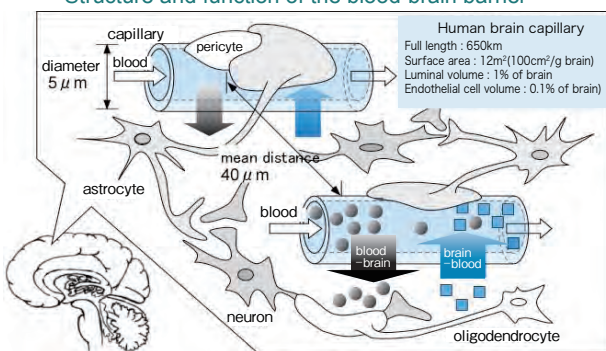
## Profile

Dr. Tetsuya Terasaki received a BSc degree in Pharmacy from Kanazawa University in 1977 and a PhD degree in Biopharmacy from the University of Tokyo in 1982. He was appointed Assistant Professor at Kanazawa University in 1982, Associate Professor at the University of Tokyo in 1992, and a Professor at Tohoku University in 1996. He completed postdoctoral training in blood-brain barrier research and was a Visiting Assistant Fellow at UCLA School of Medicine from 1985 to 1987. He received three International Awards, the Ebert Prize from the American Pharmaceutical Association (APhA) in 1985, the Meritorious Manuscript Award from the American Association of Pharmaceutical Scientists (AAPS) in 1996 and the AAPS Fellow in 2004. He also received two Research Achievement Awards, the Academy of Pharmaceutical Science and Technology, Japan (APSTJ) Award in 2007 and the Japanese Society for the Study for Xenobiotics (JSSX) Award in 2007. He has been serving as Associate Editor of the Journal of Pharmaceutical Sciences and is a member of the Founding Council of the International Brain Barrier Society. At Tohoku University he has been serving as Special Adviser to the President since 2007 as well as serving as Vice-Dean of the Graduate School of Pharmaceutical Science since 2008.

## Research Activities

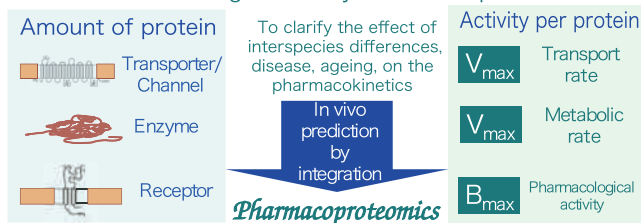
The brain closely controls the entry of xenobiotics via the blood-brain barrier (BBB) to maintain effective intellectual functions. Crossing the BBB is one of the most difficult problems to be solved for delivering a drug to the brain. Part of this is due to the lack of paracellular permeability of the brain capillary endothelial cells. In addition, brain-to-blood efflux transporter proteins operate at the BBB, and they are also known to play an important role in the apparent restriction of xenobiotic entry into the brain. We have developed the Brain Efflux Index (BEI) method and conditionally immortalized brain capillary endothelial cell lines. Using these methods, we have been able to show that the BBB functions as "a cerebral clearance system" for endogenous hydrophilic compounds, such as GABA, L-aspartic acid, homovanillic acid and indoxyl sulfate. The multiple brain-to-blood efflux transporters at the BBB are considered to act as part of the CNS detoxification system to allow normal cerebral function. Proteomic studies may also provide important insights into human BBB function. Constructing a quantitative transporter protein atlas of the human BBB would be a most important advance from the viewpoint of CNS drug discovery and drug delivery to the brain.

### Structure and function of the blood-brain barrier



The blood-brain barrier (BBB) is formed by complex tight-junctions of the brain capillary endothelial cells and expresses various transport systems. These characteristics of the BBB make it possible to control selective transport across the BBB and to limit the non-selective brain distribution of drugs. Understanding the mechanism of BBB transport is important for improving the BBB permeability of Central Nervous System acting drugs.

### Targeted Absolute Proteomics as A New Path for the Drug Discovery and Development



It is very important to develop a novel method to identify and quantify functional proteins such as transporter, channel, enzyme and receptors. This would open a new field, pharmacoproteomics, quantitative proteomics based pharmacokinetics and pharmacodynamics, allowing us to clarify the influence of changes in disease status, aging, and individual differences. Construction of a quantitative functional protein atlas in human will trigger significant progress in drug discovery and delivery in the near future.

## Message

In scientific research it is very important to discover the truth, although this is rarely easy. You must be brave if you want to succeed. Once you achieve a taste for it, you will never forget it. There are equal opportunities for anyone. If you make steady and serious efforts, you will find a rational way to discover the truth. In addition, an analytical way of thinking, the ability to find solutions, and remain flexible and focused are all, I believe, very important. When you wish to become a researcher contributing to an international society, this will be the start of a very exciting and impressive career. When you want to discuss your research interests, you will find a world without language barriers, or culture gaps. Sometime, you may not be able to find the right answer. You may realize how big the nature is and how small human beings are. However, please do not forget the importance of the environment in which you were brought up. As you know, not only a seed but also its environment is very important for growing a delicious fruit. We are pleased to provide an excellent environment and a great opportunity for you, i.e., as a unique seed in the world.