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2. Title

Interaction of Nicotine with Transport of Drugs Acting on the Central Nervous System via Orphan Nicotine Transporters

3. Period

2016-2018

4. Summary

We have identified two molecules which belong to hippocampus abundant transcript family and one transporter of solute carrier family 44A as nicotine transporters. Since these molecules are known to be expressed at the blood-brain barrier (BBB), it is possible that the molecules take part in nicotine transport across the BBB. In addition, we have succeeded the classification of central nervous system-acting drugs for interacting BBB-mediated nicotine transport. In this classification, antidepressants such as imipramine and paroxetine strongly inhibited nicotine transport at the BBB. However, our studies using an *in vitro* model of the BBB revealed that the transport properties of imipramine transport at the BBB were different from those of transport of paroxetine and nicotine at the BBB. This result suggests the independence of transport systems between imipramine, paroxetine, and nicotine at the BBB. Through this research project, we have obtained several clones for constructing expression systems to examine compound transport via orphan transporters. Therefore, our research outcomes help us to identify the transport systems of central nervous system-acting drugs in the BBB and deeply understand the interaction of BBB-mediated transport of these drugs with nicotine.