



# HOKKAIDO UNIVERSITY

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## INFORMATION

Hokkaido University conferred the degree of Doctor of Philosophy (Ph. D) in Veterinary Medicine on June 30, 2000 to 2 recipients.

The titles of theses and other information are as follows :

Molecular Pathobiological Studies on Glutamate/Aspartate Transporter (GLAST) in Canine Red Cells – Molecular Basis for Hereditary Deficiency of GLAST in Dogs –

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Canine red blood cells have a high-affinity Na/K-dependent glutamate transporter. We herein demonstrate that this transport is mediated by the canine homologue of GLAST, one of the glutamate transporter subtypes abundant in the central nervous system, based on the findings from PCR-based cDNA cloning and expression analyses of the brain and red cell transporters and immunological identification. We also demonstrate that GLAST is the most ubiquitous glutamate transporter among the transporter subtypes that have been cloned to date. Canine red cell

GLAST was a 66-kDa glycoprotein, slightly larger than that in the brain (60kDa) due to the different N-glycosylation. The GLAST protein content was extremely reduced in variant red cells, LGluT red cells characterized by an inherited remarkable decrease in glutamate transport activity. Sequencing and expression analyses of the GLAST cDNAs from LGluT dogs demonstrated that a complicated heterologous combination of a missense mutation of Gly492 to Ser and some transcriptional defect contributes in pathogenesis of the LGluT red cell phenotype.

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Original papers of this thesis appeared in "Biochim. Biophys. Acta" Vol. 1195, 211-217 (1994), and "J. Biol. Chem" Vol. 275, 6620-6627 (2000).