

Department of Pharmaceutics
Division of Pharmaceutics
School of Pharmaceutical Sciences

Outline

Urinary excretion of drug decreases when renal function was damaged. So, dosage of therapeutic agents for kidney disease patient needs adjustment. Recently, in kidney disease, alteration of extrarenal clearance of drug has been pointed out. But currently, its factor is unclear. As its factor, we focus on the drug transporter, and study about alteration of its expression in the acute renal failure. On the other hand, uremic toxins (UTs) accumulating in the body when the renal function was decreased were thought to interact with drugs and affect drug disposition. To clarify the effect of UTs, the experiments about alteration of drug disposition caused by UTs are conducted in our laboratory. And, chronic kidney disease patients use phosphorus adsorbent to prevent the absorption of phosphorus from the intestine. New phosphorus adsorbents are developed in succession and ingredients are different in each drug, so it is thought that those drugs have different property each other. So we assessed phosphorus adsorption capacity of each adsorbent in various situations, and compared each other.

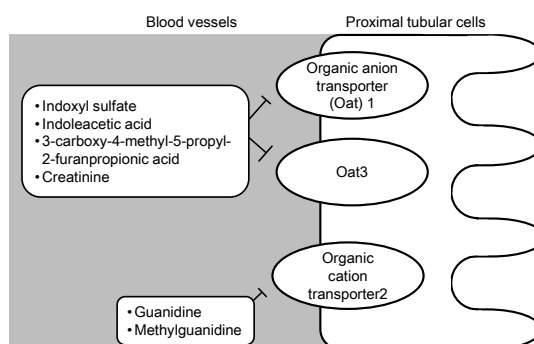
Faculty members

Professor : Masako Oda, Ph.D.

Assistant professor : Yuichi Ichimura, Ph.D.

Main research in progress

- 1) Alteration of transporters' expression in the intestine of acute renal failure model rat
- 2) Effect of UTs on the plasma concentration of drugs
- 3) Various adsorbent's phosphorus adsorbent capacity in different pH conditions
- 4) Pathogenetic mechanism of gastrointestinal disorder after injection of antineoplastic agent



Interaction of Uremic Toxins Mediating
Transporters in the Renal Proximal Tubular Cell

Current publications

Saito T, Ichimura Y, Oda M, Saitoh H.

Preferential meropenem absorption activated by 1 α ,25-dihydroxyvitamin D₃ and shared with foscarnet, a phosphate transporter substrate, in the rat ileum, *Drug Metab. Pharmacokinet.*, **55**, 100997(2024).

Takeda F., Oda M., Terasaki M., Kubota A., Asada K., Ichimura Y., Kojima H., Saitoh H., Downregulated expression of organic anion transporting polypeptide (Oatp) 2b1 in the small intestine of rats with acute kidney injury, *Drug Metab. Pharmacokinet.*, **40**, 100411 (2021).

Ichimura Y., Kudoh N., Murabe T., Akao T, Watanuki S., Suzuki T., Saito T., Oda M., Saitoh H., Inhibitory effects of indoxyl sulfate and creatinine on the renal transport of meropenem and biapenem in rats, *Drug Metab. Pharmacokinet.*, **40**, 100406 (2021).

Takeda F., Oda M., Terasaki M., Ichimura Y., Kojima H., Saitoh H., Downregulated expression of intestinal P-glycoprotein in rats with cisplatin-induced acute kidney injury causes amplification of its transport capacity to maintain “gatekeeper” function, *Toxicol. Appl. Pharmacol.*, **423**,115570 (2021).

Ichimura Y., Kudoh N., Ito S., Oda M., Saitoh H., Inhibitory Effect of Anionic Uremic Toxins and Creatinine on the Renal Transport of Methotrexate in Rats, *BPB reports*, **4**, 36-40(2021).

Suga H., Ichimura Y., Oda M., Saitoh H., Different Correlation between Serum Levels of Indoxyl Sulfate and Estimated GFR in the Elderly with or without Dementia, **3**, 102-105 (2020).

Oda M., Furuto Y., Ichimura Y., Mori M., Takahashi M., Saitoh H., Stability of Suvorexant (Belsomra®) Tablets in One-Dose Package, *Iryo Yakuzgaku (Japanese Journal of Pharmaceutical Health Care and Science)*, **46**, 606 -612 (2020).

Suga H., Ichimura Y., Otsuka S., Sugaya K., Oda M., Saitoh H., Limited Effect of Intravenously Administered Indoxyl Sulfate, a Uremic Toxin, on the Hepatic Transport of Pravastatin in Normal Rats, *Pharmacology & Pharmacy*, **9**, 270-278 (2018).

Iwao K., Kawai T. R., Oda M., Saitoh H., Investigation on the Interactions between Various Drugs and Aojiru (Green Juice) using a Simple Centrifugation Method, *Biol. Pharm. Bull.*, **40**, 1566-71 (2017).

Ichimura Y., Takamatsu H., Ideuchi H., Oda M, Takeda K., Saitoh H., Correlations between Plasma Levels of Anionic Uremic Toxins and Clinical Parameters in Hemodialysis Patients, *Yakugaku Zasshi*, **136**, 1177-84 (2016).

Oda M., Kudo T., Ichimura Y., Saitoh H., Phosphate as a Determinant of the Difference in Drug Interactions Due to Colestyramine and Colestimide, *Iryo Yakugaku*, **41**, 191-197 (2015).