

Title of Research:

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Quantitative prediction of the pharmacokinetics of chemical substances by the use of mathematical model with considering the age-dependent functional changes of metabolic enzymes and transporters

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Summary of Research:

To predict the influence of age on the pharmacokinetics of chemical substances, we performed a human clinical study for investigating the age-dependent functional changes of metabolism and transport processes of compounds with healthy adults and aged persons. The involvement of OCT family transporters in the membrane transport of cationic compounds was investigated both in vitro and in vivo. As a result, triptans especially sumatriptan and zolmitriptan can be used as good probe drugs for hepatic OCT1. We also found that OCT2 is responsible for the renal uptake of trimethylammonium N-oxide (TMAO).

Timeline:

March 1, 2015 -

Topics:

2015 JCIA LRI result presentation (poster) "Quantitative prediction of the pharmacokinetics of chemical substances by the use of mathematical model with considering the age-dependent functional changes of metabolic enzymes and transporters"

Publications:

Takeshi Miyake, Hiroyuki Kusuhara "Investigation of the transporters involving renal uptake and efflux of trimethylamine N-oxide (TMAO)", 30th Japan Society of the Study of Xenobiotics (JSSX) Annual meeting, Tokyo, 2015.11

Takeshi Miyake, Hiroyuki Kusuhara "Organic Cation Transporter 2 (OCT2) is responsible for the renal influx of trimethylamine N-oxide (TMAO)", 21st Forum for Pharmaceutical Technology Innovation Workshop for young scientists, Tokyo, 2015.11

Takeshi Miyake "Organic Cation Transporter (OCT) is Responsible for the Renal Influx of Trimethylamine N-oxide (TMAO)", Academy of Pharmaceutical Sciences and Technology, Japan (APSTJ) Global Education Seminar 15-3, Shizuoka, 2016.2