Organic cation transporter 2 mRNA expression in dorsal root ganglia neurons

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Organic cation transporters (OCTs) play an important role in transporting cationic xeno- and endobiotics across biological membranes. In particular their role in platinum drugs transport, such as cisplatin and oxaliplatin, has recently been studied in many normal tissues and cancer cells and it has become increasingly clear the role of these transporters in key tissues responsible for drug absorption and disposition, i.e. the kidney, liver and intestine. However, only limited information is available regarding their distribution and activity in nervous system.

This study investigates (1) the expression of OCT2 in rat dorsal root ganglia (DRG) and (2) quantifies the developmental changes in the mRNA expression of OCT2 in DRG neurons isolated from embryonic E15 and young adult Wistar rats.

OCT2 mRNA expression in rat DRG was localized by *in situ* hybridization experiments and quantified by TaqMan Real Time PCR. Our results demonstrated the expression of OCT2 mRNA in rat DRG and its neuronal localization.

In order to verify possible developmental changes in the OCT2 expression we quantified by TaqMan Real Time PCR the OCT2 mRNA using *in vitro* models of DRG neurons obtained from embryonic E15 rats and from young adult rats. OCT2 mRNA expression was lower in embryonic neuron cultures than in young adult rats, demonstrating a developmental change in the expression of this transporter in rat DRG neurons. The OCT2 mRNA expression in 8-week of age rats approached adult expression levels.

Although it has been reported that the OCT2 mRNA expression in the kidney is gender dependent, our preliminary data obtained in DRG of adult Wistar rats did not demonstrate any gender difference in OCT2 mRNA expression.

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Key words
Organic cation transporter, dorsal root ganglia neurons, developmental expression