

# Expression Profiles of Metabolic Enzymes and Efflux Transporters in Sprague Dawley Rat

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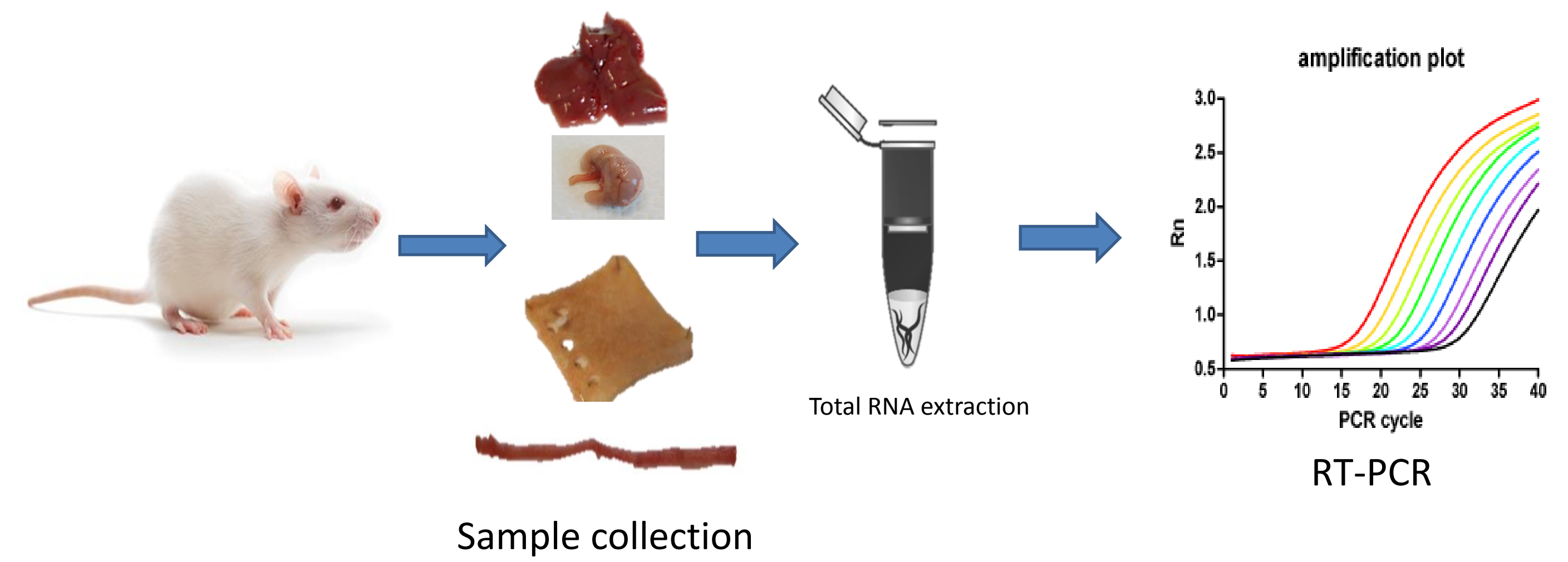
## BACKGROUND

The rat is the most widely used animal model in pharmacokinetics and metabolism studies. However, little is known about the tissue distribution of major drug metabolizing enzymes and efflux drug transporters in this animal model, mainly in the skin.

This work was conducted to characterize the expression profiles of major CYP enzymes and drug efflux transporters in skin, liver, kidney, intestine and stomach of male Sprague Dawley rat.

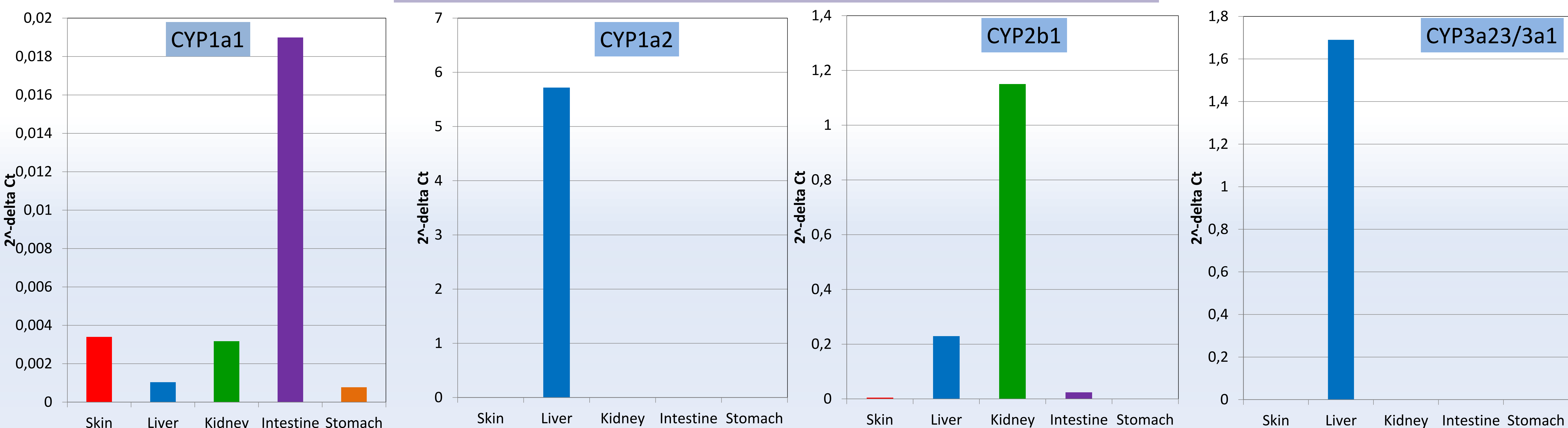
## METHODS

- Total RNA from skin, liver, kidney, intestine and stomach of male Sprague Dawley rats were used as a pool (N = 3 animals).
- Expression levels of CYP1a1, CYP1a2, CYP2b1, CYP3a23/3a1 and four efflux transporters belonging to ABC transporter family were analyzed by TaqMan Real-time RT-PCR.
- GAPDH, was used as reference gene in order to normalize the target transcript.

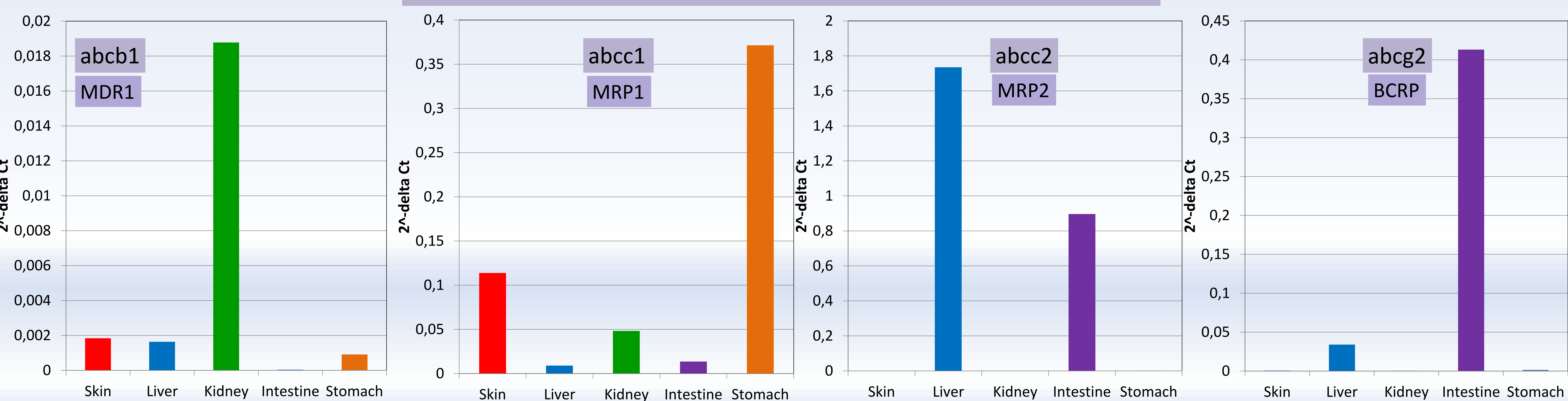


## RESULTS

### GENE EXPRESSION OF CYPs



### GENE EXPRESSION OF ABC TRANSPORTERS



- CYP1a1 was expressed in all tissues with the highest levels in the intestine. CYP1a2 and CYP3a23/3a1 were strongly expressed in the liver. CYP2b1 was mainly expressed in the kidney followed by the liver and intestine. Expression level of all CYPs was very low in the stomach.
- Abcb1 (MDR1) and Abcc1 (MRP1) were expressed in all tissues with the highest levels in the kidney and stomach, respectively. Abcc2 (MRP2) was highly expressed in the liver and intestine, while BCRP was highly expressed in the intestine.

## CONCLUSION

Quantitative comparison of the expression of drug metabolizing enzymes and drug efflux transporters in rat tissue correlated well with human data [1, 2] and will help to better interpret pharmacokinetic studies in rat and improve *in vitro/in vivo* correlations.

1. H. Osman-Ponchet et al., Characterization of ABC transporters in human skin. (2014), Drug Metabol Drug Interact.  
2. M. Alriquet et al., Characterization of SLC transporters in human skin. (2015), ADMET & DMPK.