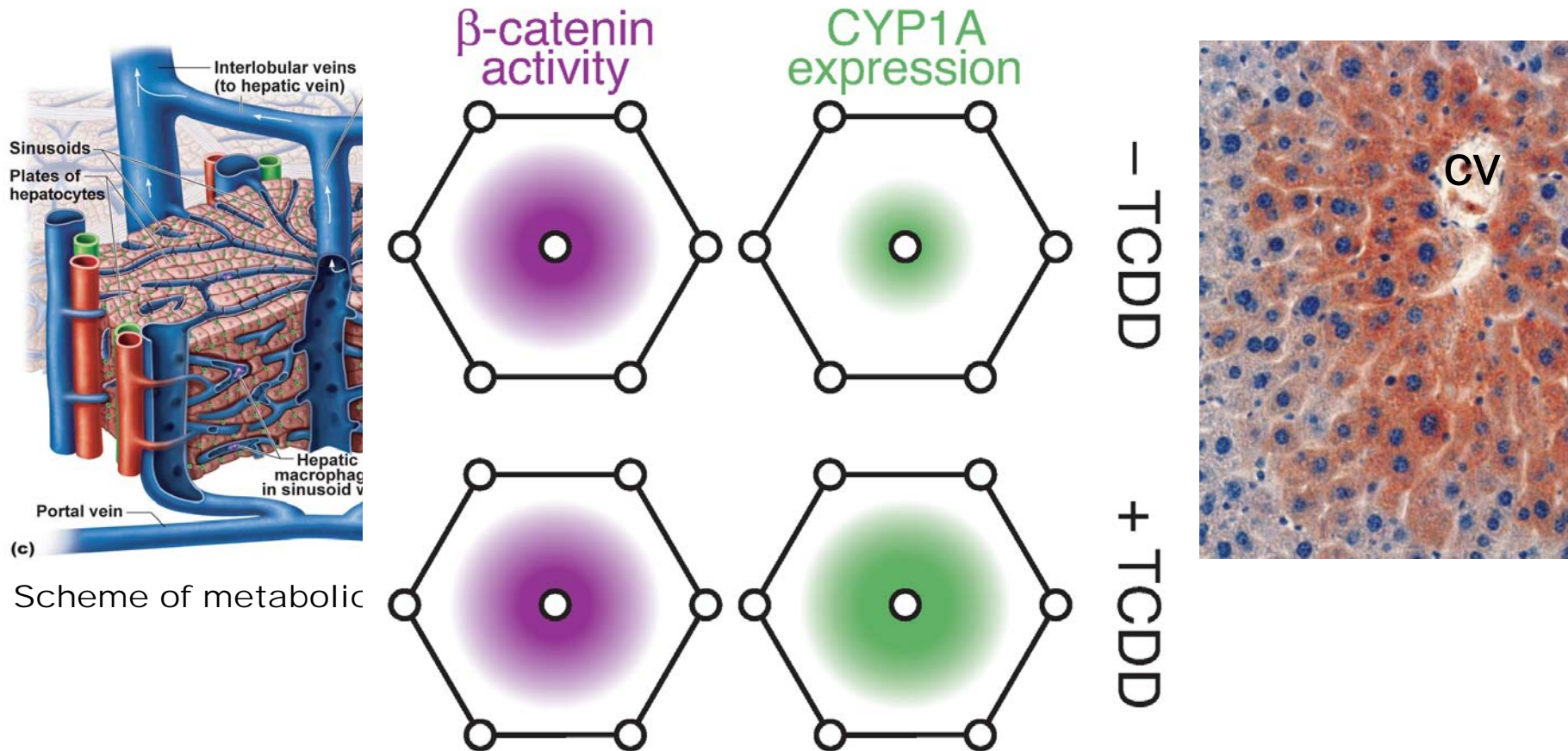


# Signal integration by the *CYP1A1* promoter - a quantitative study

Albert Braeuning

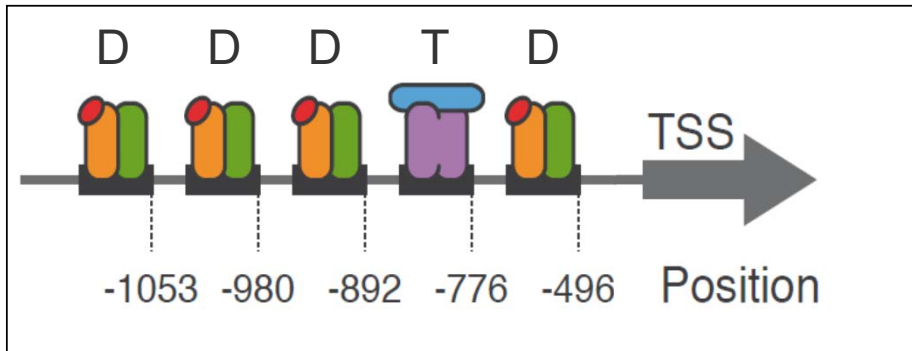
# Metabolic zonation of the liver



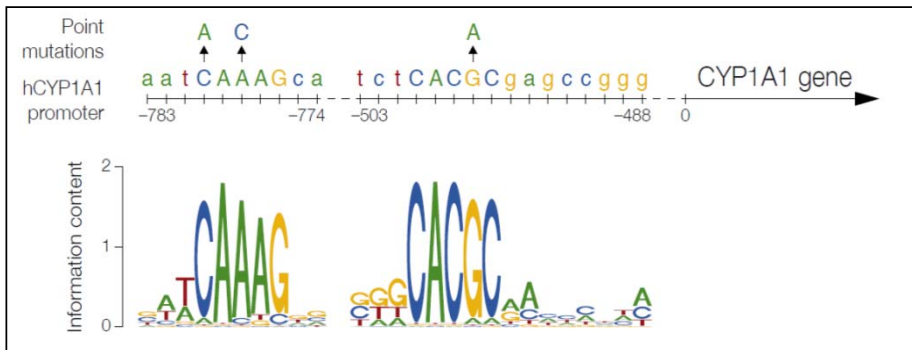
- signaling through AhR and  $\beta$ -catenin jointly regulates expression of CYP1A
- aim of the study was to decipher the interplay of the two signaling pathways

# Study design and experimental workflow

## CYP1A1 promoter characterization



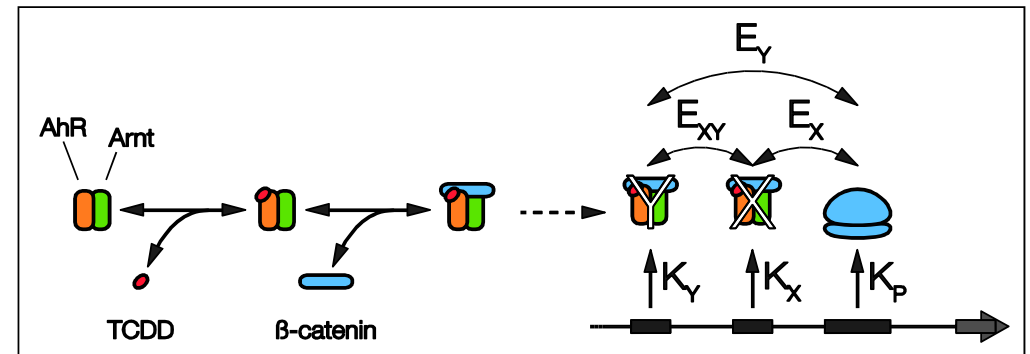
## site-directed mutagenesis



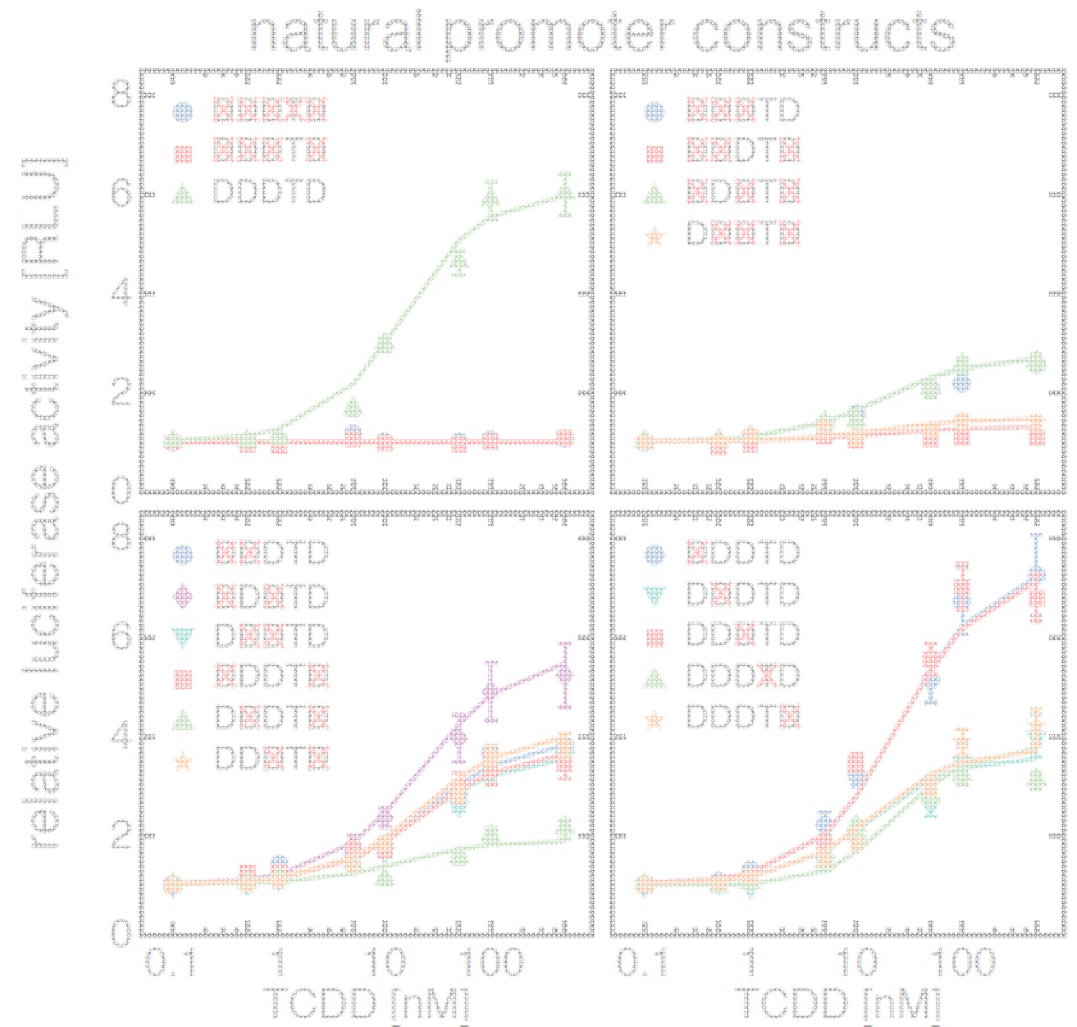
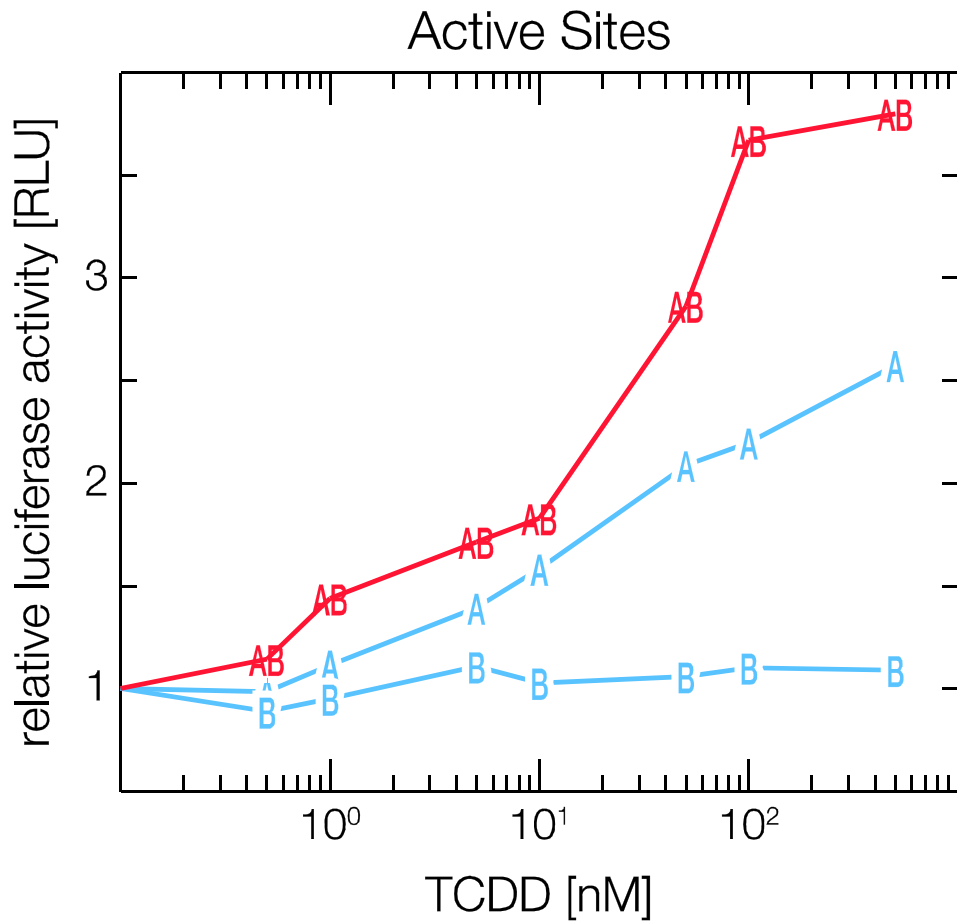
cell treatment

reporter gene analysis

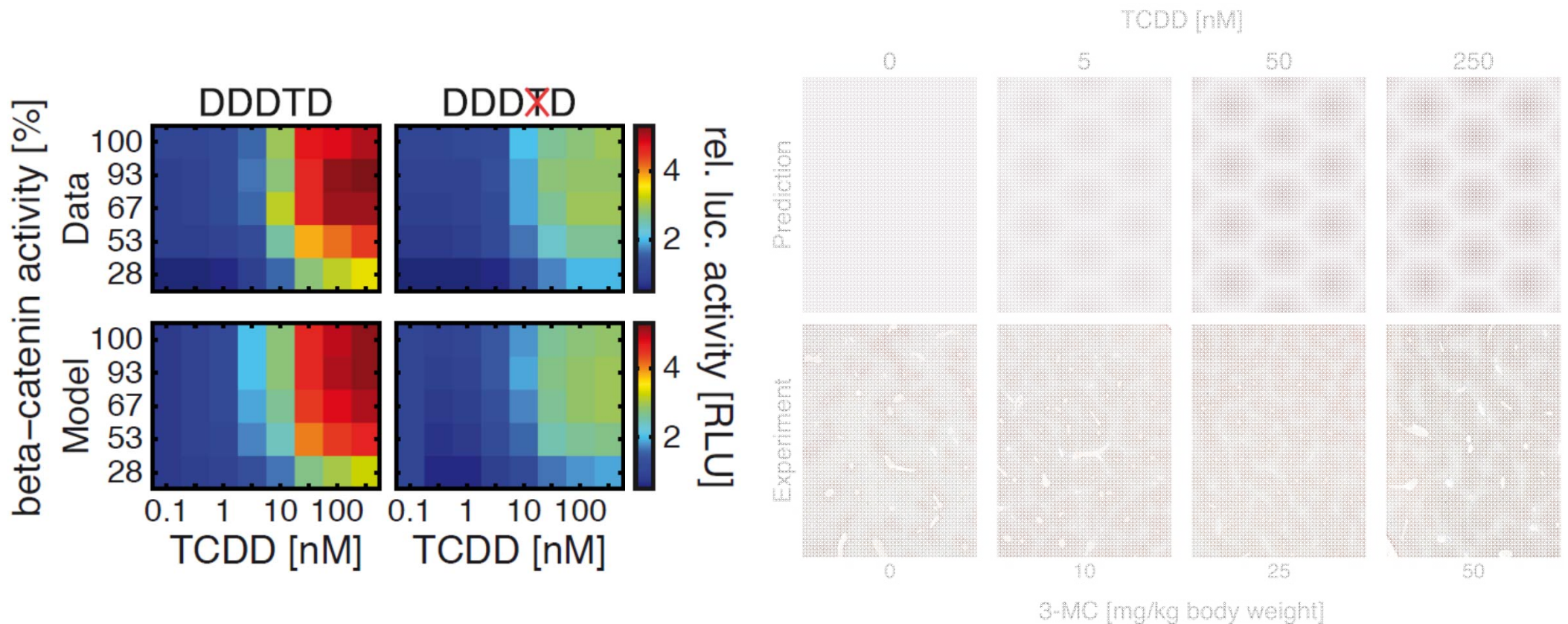
mathematical modeling



# Results and model predictions – AhR



## Results and model predictions – AhR and $\beta$ -catenin



- $\beta$ -catenin and AhR synergize in CYP1A1 regulation
- crosstalk via individual binding sites and physical protein interactions
- mathematical modeling accurately describes hepatic CYP1A1 expression

Thank you for your attention

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