Currently, there is a need for a reliable human hepatocyte cell line that accurately simulates alcohol consumption in vivo through metabolic pathways. Our study aimed to develop an in vitro model for hepatocyte metabolism of alcohol, which could help understand the effects of alcohol on the liver and improve the accuracy of in vitro studies on liver metabolism.

**Materials and Methods**

1. **Cell Culture**: Primary human hepatocytes were isolated from liver biopsies of male and female donors and cultured in Tri-Culture Medium (TCPM) in 24-well collagen I-coated BioCoat® plates.
2. **Reference Compound Treatment**: Tri-cultures were treated with reference compounds (phenobarbital, rifampicin, chenodeoxycholic acid, and PB). RNA was isolated from samples using QIAamp RNA mini kits with DNase and reverse transcribed using QIAGEN Reverse Transcription kits (Applied Biosystems/Life Technologies, Grand Island, NY). qPCR was performed on an Applied Biosystems 7900HT Fast Real-Time PCR system.

**Results**

- **Induction of CYP and UGT Genes**: The results showed consistent induction of CYP and UGT gene expression across donor lots for PXR and CAR agonists. Notably, PB kinetics at physiologic levels (0.1 μM) showed changes in CYP and UGT gene expression or 7-EC metabolism.

**Discussion**

The human hepatocyte tri-culture model represents a useful tool for studying compound-induced hepatic clearance of thyroxine in humans. In conclusion, the technology offers a reliable and reproducible model for investigating the effects of various compounds on liver metabolism.

**References**

2. Klaassen CD and Hood AM (2001) Effects of microsomal enzyme inducers on thyroid follicular cell proliferation and thyroid hormone metabolism: inhibition of thyroxine (T4) glucuronidation rates after exposure to PCB153 exhibited optimal responses to CAR and PXR agonists (e.g., 6.0-fold increases in T4 glucuronidation rates after exposure to PCB153, while altering the rank order of PCB153, suggesting additional elimination mechanisms involved in T4 clearance in the presence of T4 glucuronidation).

**Conclusions**

The hepatocyte tri-culture model provides a reliable tool for the study of compound-induced hepatic clearance of thyroxine in humans. This model can be used to assess the metabolic effects of different compounds on liver metabolism, providing valuable insights into the mechanisms of liver function and disease.