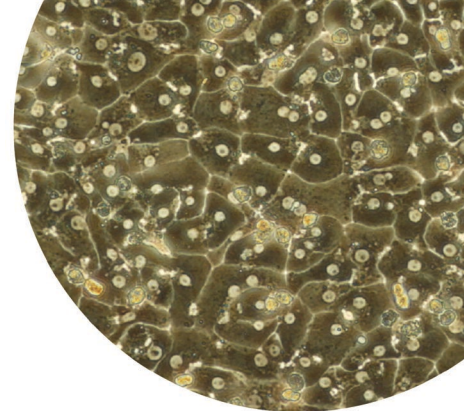


Product Characterization Sheet

Human cryopreserved hepatocytes

Lot number: Hu4224



Donor demographics

Species	Sex	Race	Age	BMI	Smoker	Alcohol use	Drug use	Medications	Serological data	Cause of death
Human	Female	Caucasian	40 years	18.0	No	Yes *	No	None listed	CMV+	Anoxia

Post-thaw viability and cell quality assessment

Thawing medium used	Optimal centrifuge conditions	% Viability (post-thaw)	Viable cell yield per vial
CHRM	100 x g for 10 min at room temperature	89%	6.3×10^6

Monolayer assessment

Plating medium used	Well format	Culture medium used	Optimal seeding density	Initial attachment efficiency	Monolayer confluency after 48 hr in culture
Williams' Medium E	24-well hand-coated plate	Williams' Medium E	0.80×10^6 cells/ml	75%	80%

Ordering Information

Product	Quantity	Cat. no.
Cryopreserved human hepatocytes	6.3×10^6 cells/1.5 ml vial	HMCPMSA

To place an order or inquire about our products and services, contact us by phone: 866 952 3559 (toll free in the USA) or +1 919 237 4679; email: hapticproducts@invitrogen.com; or visit us on the web at www.invitrogen.com/admetox.

* Occasional drink of wine

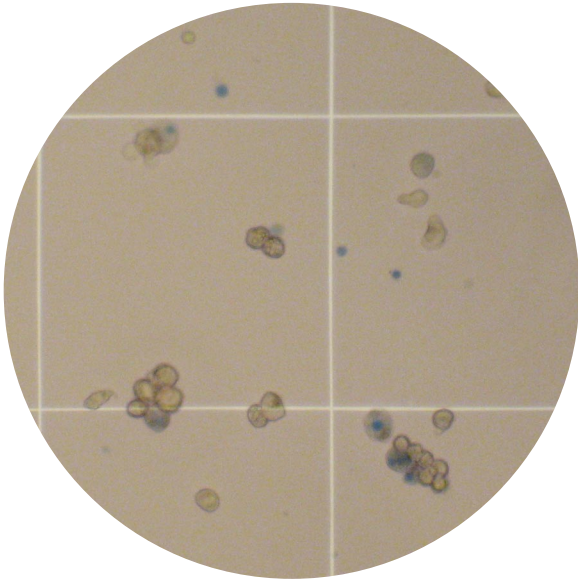
Plated metabolism (Intrinsic clearance) – $\mu\text{L}/\text{min}/10^6$ cells

Midazolam	Tolbutamide	Dextromethorphan
4.91	0.82	5.71

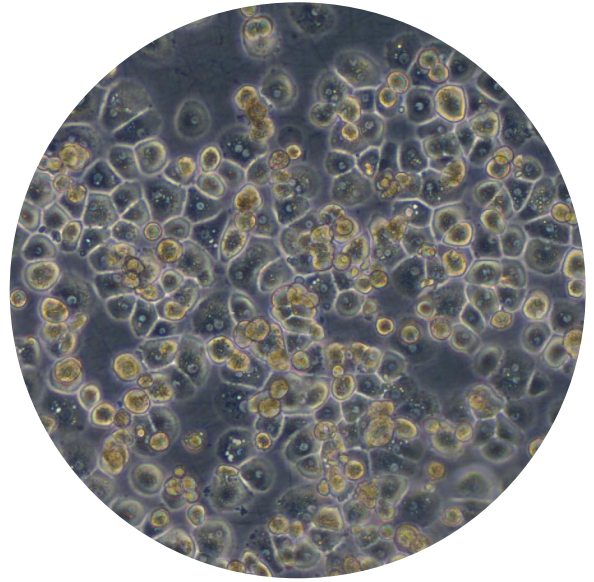
Genotyping results

Lot no.	CYP2C9	CYP2C19	CYP2D6	CYP3A5
Hu4224	TBD	TBD	TBD	TBD

Photomicrographs of Hu4224



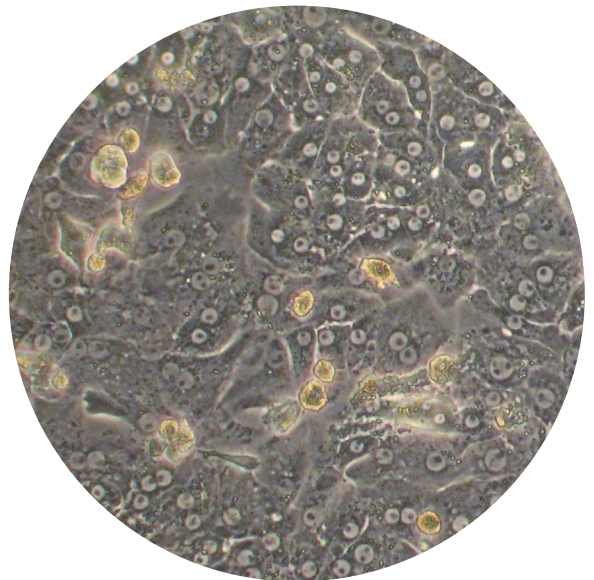
Post-thaw (10x)



5 hours after plating (24-well: 10x)



Day 2 (24-well: 10x)



Day 3 (24-well: 10x)

Metabolic assay conditions

Cryopreserved Human Hepatocytes were seeded in 48-well coated plates at 0.8×10^6 cells/mL (unless otherwise noted) and allowed to attach prior to metabolic incubations. Prototypical cytochrome P450 substrates midazolam, tolbutamide, and dextromethorphan were used to assess the enzymatic function of CYP3A4/5, CYP2C9 and CYP2D6 respectively. The concentrations and incubation times are included in the chart below. Incubations were conducted in duplicate in serum-free Williams Medium E culture medium and reactions allowed to proceed in a humidified incubator at 37°C, 95% relative humidity, and 5% CO₂ on an orbital shaker. Reactions were stopped with the addition of ice-cold acetonitrile. Well contents were stored at -70°C prior to analysis. The disappearance of parent was monitored by LC-MS/MS analysis and intrinsic clearance (CL_{int}) values determined by linear regression.

Table 2—Incubation conditions for CL_{int} in plated cryopreserved human hepatocytes.

Substrate	Concentration (μM)	Incubation Time (h)
Midazolam	0.50	0,1,2,4,6,8
Tolbutamide	1.00	0,4,6,8,18,24
Dextromethorphan	1.00	0,1,2,4,6,8

Genotyping

Genetic polymorphisms in metabolic enzymes such as CYP's can affect the way an individual responds to drug therapies. In some cases, an adjustment in dose will be necessary to elicit response, while in others, a drug may need to be replaced entirely because of a genetic polymorphism. Hepatic *in vitro* assays which employ genotyped hepatocytes can be used to study drug disposition in certain individuals with inherent SNPs. Invitrogen screens donor tissues for thirteen different SNPs within four drug-metabolizing genes. These include the following: CYP2C9*2, CYP2C9*3, CYP2C9*6, CYP2C19*2, CYP2C19*3, CYP2C19*6, CYP2D6*3, CYP2D6*4, CYP2D6*6, CYP2D6*9, CYP3A5*3, CYP3A5*6, and CYP3A5*8. All SNPs were identified by qRT-PCR with Taqman® primer/probe sets.

References

1. FDA. (1997) Guidance for Industry—Drug metabolism/drug interaction studies in the drug development process: Studies *in vitro*, Food and Drug Administration Publication.
2. Xu, L. et al. (2000) 2,3,7,8 Tetrachlorodibenzo-p-dioxin induction of cytochrome P4501A in cultured rat and human hepatocytes. *Chem Biol Interact* 124:173–189.
3. LeCluyse, E. (2001) Pregnane X receptor: Molecular basis for species differences in CYP3A induction by xenobiotics. *Chem Biol Interact* 134:283–289.
4. LeCluyse, E.L. (2001) Human hepatocyte culture systems for the *in vitro* evaluation of cytochrome P450 expression and regulation. *Eur J Pharm Sci* 13:343–368.
5. Maurel, P. (1996) The use of adult human hepatocytes in primary culture and other *in vitro* systems to investigate drug metabolism in man. *Adv Drug Del Rev* 22:105–132.
6. Hamilton, G.A. et al. (2001) Regulation of cell morphology and cytochrome P450 expression in human hepatocytes by extracellular matrix and cell–cell interactions. *Cell Tissue Res* 306:85–99.
7. LeCluyse, E. et al. (2000) Expression and regulation of cytochrome P450 enzymes in primary cultures of human hepatocytes. *J Biochem Mol Toxicol* 14:177–188.
8. Wang, H. and LeCluyse, E. (2003) Role of orphan nuclear receptors in the regulation of drug metabolizing enzymes. *Clin Pharmacokinet* 42:1331–1357.
9. LeCluyse, E.L. et al. (2005) Isolation and culture of primary human hepatocytes. *Methods Mol Biol* 290:207–229.
10. Bjornsson, T. et al. (2003) The conduct of *in vitro* and *in vivo* drug–drug interaction studies: a Pharmaceutical Research and Manufacturers of America (PhRMA) perspective. *Drug Metab Dispos* 31:815–832.



www.invitrogen.com

07.07.2010

For research use only. Not intended for any animal or human therapeutic or diagnostic use, unless otherwise stated.

©2009 Life Technologies Corporation. All rights reserved. The trademarks mentioned herein are the property of Life Technologies Corporation or their respective owners. These products may be covered by one or more Limited Use Label Licenses (see Invitrogen catalog or www.invitrogen.com). By use of these products you accept the terms and conditions of all applicable Limited Use Label Licenses.