XENOTECH
A BioIVT Company

Data Sheet
Certificate of Analysis

XTreme 200
Lot No. 2310130

Human Liver S9 Fraction
Mixed Gender, Pool of 200
Suspension medium: 50 mM Tris·HCl, 150 mM KCl, 2 mM EDTA

H2610.S9	**0.5 mL at 20 mg/mL**
H2620.S9	**1.0 mL at 20 mg/mL**
H2630.S9	**5.0 mL at 20 mg/mL**
H2640.S9	**50.0 mL at 20 mg/mL**

Specific Content and Enzyme Activities		***Content / Rate***
Cytochrome P450 content	(nmol/mg protein)	0.161
Cytochrome b_5 content	(nmol/mg protein)	0.075
7-Ethoxycoumarin *O*-dealkylation	(pmol/mg protein/min)	151 ± 9
Glucuronidation of 4-methylumbelliferone	(nmol/mg protein/min)	22.4 ± 0.7
CDNB [a]	(nmol/mg protein/min)	394 ± 15
Phthalazine oxidation	(pmol/mg protein/min)	2110 ± 180

Enzyme	**Marker Substrate Reaction**	**[S] (µM)**	**Rate (pmol/mg protein/min)**
CYP1A2	Phenacetin *O*-dealkylation	80	98.8 ± 8.3
CYP2A6	Coumarin 7-hydroxylation	50	245 ± 6
CYP2B6	Bupropion hydroxylation	500	170 ± 6
CYP2C8	Amodiaquine *N*-dealkylation	20	614 ± 45
CYP2C9	Diclofenac 4'-hydroxylation	100	590 ± 59
CYP2C19	*S*-Mephenytoin 4'-hydroxylation	400	14.9 ± 1.5
CYP2D6	Dextromethorphan *O*-demethylation	80	64.5 ± 2.9
CYP2E1	Chlorzoxazone 6-hydroxylation	500	546 ± 11
CYP3A4/5	Testosterone 6β-hydroxylation	250	682 ± 68
CYP3A4/5	Midazolam 1'-hydroxylation	30	192 ± 7
CYP4A11	Lauric acid 12-hydroxylation	100	251 ± 8

[a] 1-Chloro-2,4-dinitrobenzene-glutathione conjugation by glutathione *S*-transferase.

Values for enzyme activities were determined at a single substrate concentration and are mean ± standard deviation of three or more determinations.

Each donor is equally represented in this pool.

Store at -80°C

CAUTION: This sample should be considered as a potential biohazard and universal precautions should be followed. Intended for *in vitro* use only.

This data sheet serves as a Certificate of Analysis and has been approved by Stephanie Helmstetter, Assistant Director.
Signature and Date: Stephanie Helmstetter 22 May 2023

Assay conditions

To measure cytochrome P450 (CYP) activity, liver S9 samples (0.2 mg/mL) were incubated in triplicate at 37 ± 2°C for 10 minutes in potassium phosphate buffer (50 mM, pH 7.4), containing $MgCl_2$ (3.0 mM), EDTA (1.0 mM), NADP (1.0 mM), glucose-6-phosphate (5.0 mM), glucose-6-phosphate dehydrogenase (1 Unit/mL) and 7-ethoxycoumarin (500 µM), at the final concentrations indicated. Metabolite formation was determined by validated LC-MS/MS methods with deuterated metabolites as internal standards.

To measure UDP-glucuronosyltransferase (UGT) activity, liver S9 samples (0.1 mg/mL) were incubated in triplicate at 37 ± 2°C for 10 minutes in Tris-HCl (100 mM, pH 7.7 at 37°C), CHAPS (0.5 mM), EDTA (1.0 mM), $MgCl_2$ (10 mM), D-saccharic acid 1,4-lactone (100 µM), uridine diphosphate-glucuronic acid (8.0 mM) and 4-methylumbelliferone (1 mM), at the final concentrations indicated. Metabolite formation was determined by validated LC-MS/MS methods with deuterated metabolites as internal standards.

To measure glutathione S-transferase activity (GST), liver S9 samples (5 to 50 µg/mL) were incubated in triplicate at 37 ± 2°C for 10 minutes in potassium phosphate buffer (100 mM, pH 6.5), glutathione (1 mM), and CDNB (1 mM), at the final concentrations indicated. Reaction rates are determined by photometric kinetic measurements at 340 nm.

To measure aldehyde oxidase (AO) activity, liver S9 samples (0.05 mg/mL) were incubated in triplicate at 37 ± 2°C for 1 minute in potassium phosphate buffer (50 mM, pH 7.4) and phthalazine (25 µM), at the final concentrations indicated. Metabolite formation was determined by validated LC-MS/MS methods with deuterated metabolites as internal standards.

Donor Information

Sample	Gender	Age (Yrs)	Race	Cause of Death
248	M	29	Hispanic	Head trauma
255	M	46	Hispanic	Anoxia
262	M	42	Caucasian	Cerebrovascular accident
375	M	23	Caucasian	Head trauma
384	M	53	Caucasian	Anoxia
400	F	42	Caucasian	Anoxia
407	M	69	Caucasian	Cerebrovascular accident
408	M	32	Caucasian	Head trauma
411	M	55	Caucasian	Anoxia
412	M	66	Caucasian	Cerebrovascular accident
437	M	62	Caucasian	Cerebrovascular accident
451	M	58	Caucasian	Cerebrovascular accident
466	M	48	Caucasian	Anoxia
475	M	27	Caucasian	Anoxia
515	F	59	Caucasian	Cerebrovascular accident
530	F	64	Caucasian	Head trauma
532	M	26	Caucasian	Head trauma
533	M	28	African American	Anoxia
542	F	53	Caucasian	Cerebrovascular accident
544	M	45	Caucasian	Anoxia
546	F	53	Caucasian	Cerebrovascular accident
554	F	43	Caucasian	Anoxia
558	M	50	Caucasian	Anoxia
561	M	55	African American	Cerebrovascular accident
564	F	42	Caucasian	Cerebrovascular accident
572	M	68	Caucasian	Cerebrovascular accident
574	M	63	Caucasian	Cerebrovascular accident
576	F	55	Caucasian	Cerebrovascular accident
577	F	23	Caucasian	Cerebrovascular accident
582	F	60	Caucasian	Anoxia
589	F	55	Caucasian	Cerebrovascular accident
594	F	51	Caucasian	Cerebrovascular accident
599	M	51	Caucasian	Cerebrovascular accident
603	F	67	Caucasian	Head trauma
605	F	49	Caucasian	Cerebrovascular accident
608	F	54	Caucasian	Anoxia
609	F	48	Caucasian	Anoxia
611	F	25	Caucasian	Cerebrovascular accident
617	F	52	Caucasian	Cerebrovascular accident
618	F	70	Caucasian	Cerebrovascular accident
619	F	45	Caucasian	Cerebrovascular accident
625	F	39	Caucasian	Anoxia
628	F	62	Caucasian	Cerebrovascular accident

Donor Information

Sample	Gender	Age (Yrs)	Race	Cause of Death
634	F	63	Caucasian	Cerebrovascular accident
659	F	33	Hispanic	Anoxia
686	F	52	Caucasian	Anoxia
706	F	53	Caucasian	Cerebrovascular accident
721	F	52	Caucasian	Cerebrovascular accident
726	F	48	Caucasian	Cerebrovascular accident
729	F	66	Caucasian	Head trauma
736	F	46	Caucasian	Anoxia
744	M	57	Caucasian	Cerebrovascular accident
750	F	53	Caucasian	Anoxia
756	F	47	Caucasian	Cerebrovascular accident
761	M	70	Caucasian	Cerebrovascular accident
763	F	53	Caucasian	Anoxia
765	F	39	Caucasian	Cerebrovascular accident
771	F	47	Hispanic	Anoxia
778	M	61	Caucasian	Cerebrovascular accident
784	F	63	Caucasian	Head trauma
788	F	58	Caucasian	Cerebrovascular accident
808	M	57	Caucasian	Cerebrovascular accident
818	M	48	Hispanic	Cerebrovascular accident
819	F	49	Caucasian	Head trauma
820	F	65	Caucasian	Cerebrovascular accident
821	F	51	Caucasian	Anoxia
823	F	67	Caucasian	Anoxia
826	F	55	Caucasian	Cerebrovascular accident
839	F	25	African American	Cerebrovascular accident
840	M	77	Caucasian	Cerebrovascular accident
841	M	74	Caucasian	Head trauma
847	F	55	Caucasian	Cerebrovascular accident
851	F	47	Caucasian	Cerebrovascular accident
855	F	63	Hispanic	Cerebrovascular accident
858	F	69	Hispanic	Cerebrovascular accident
859	F	69	Caucasian	Cerebrovascular accident
860	F	67	Asian	Cerebrovascular accident
861	F	61	Caucasian	Head trauma
862	M	45	Hispanic	Cerebrovascular accident
864	F	46	Caucasian	Cerebrovascular accident
867	F	39	Hispanic	Cerebrovascular accident
869	F	39	Hispanic	Cerebrovascular accident
870	F	44	Caucasian	Head trauma
874	F	65	Caucasian	Cerebrovascular accident
898	F	58	African American	Cerebrovascular accident
899	F	49	African American	Anoxia

Donor Information

Sample	Gender	Age (Yrs)	Race	Cause of Death
901	F	71	Caucasian	Cerebrovascular accident
902	F	54	Caucasian	Cerebrovascular accident
903	F	54	African American	Anoxia
919	F	39	Caucasian	Anoxia
927	F	64	Hawaiian	Cerebrovascular accident
947	F	45	Caucasian	Cerebrovascular accident
948	M	53	Hispanic	Cerebrovascular accident
949	M	53	Caucasian	Cerebrovascular accident
950	M	55	Caucasian	Cerebrovascular accident
956	F	68	African American	Anoxia
966	F	53	Caucasian	Head trauma
968	M	54	Caucasian	Cerebrovascular accident
972	M	49	Caucasian	Cerebrovascular accident
975	M	46	Hispanic	Cerebrovascular accident
976	F	61	Caucasian	Head trauma
977	M	54	Caucasian	Head trauma
978	F	56	Hispanic	Cerebrovascular accident
979	M	53	Caucasian	Cerebrovascular accident
982	F	30	Caucasian	Anoxia
983	M	49	Caucasian	Anoxia
984	M	51	Caucasian	Cerebrovascular accident
989	F	47	Caucasian	Cerebrovascular accident
990	M	38	Caucasian	Cerebrovascular accident
991	M	42	Caucasian	Cerebrovascular accident
994	F	73	Caucasian	Cerebrovascular accident
995	F	45	Caucasian	Cerebrovascular accident
999	F	19	Hispanic	Anoxia
1001	F	50	American Indian	Cerebrovascular accident
1002	M	48	African American	Cerebrovascular accident
1003	F	75	Caucasian	Cerebrovascular accident
1004	F	45	Caucasian	Head trauma
1005	M	45	Caucasian	Cerebrovascular accident
1006	M	50	Caucasian	Anoxia
1007	M	20	Caucasian	Head trauma
1008	M	36	Hispanic	Cerebrovascular accident
1009	M	22	Caucasian	Cerebrovascular accident
1010	M	63	Caucasian	Cerebrovascular accident
1011	M	65	Caucasian	Cerebrovascular accident
1012	M	41	Caucasian	Anoxia
1013	M	51	Caucasian	Cerebrovascular accident
1014	M	55	Caucasian	Anoxia
1015	M	59	Caucasian	Cerebrovascular accident
1016	M	64	Hispanic	Head trauma
1018	M	59	Caucasian	Anoxia
1020	F	24	Caucasian	Cerebrovascular accident

Donor Information

Sample	Gender	Age (Yrs)	Race	Cause of Death
1022	M	41	Caucasian	Anoxia
1024	F	59	Caucasian	Anoxia
1025	M	57	Caucasian	Cerebrovascular accident
1026	F	55	African American	Head trauma
1027	F	63	Caucasian	Cerebrovascular accident
1028	F	51	African American	Cerebrovascular accident
1029	M	48	Caucasian	Anoxia
1030	M	67	Caucasian	Cerebrovascular accident
1031	F	70	Caucasian	Cerebrovascular accident
1032	M	64	Caucasian	Cerebrovascular accident
1033	F	55	Caucasian	Cerebrovascular accident
1034	M	45	Caucasian	Anoxia
1037	M	27	Caucasian	Cerebrovascular accident
1042	M	51	Caucasian	Cerebrovascular accident
1044	F	19	Caucasian	Anoxia
1045	M	48	Caucasian	Cerebrovascular accident
1046	M	49	Caucasian	Anoxia
1047	M	53	Hispanic	Cerebrovascular accident
1051	F	57	African American	Cerebrovascular accident
1054	M	19	Caucasian	Head trauma
1055	F	29	African American	Head trauma
1060	M	49	Hispanic	Cerebrovascular accident
1061	M	40	Hispanic	Cerebrovascular accident
1063	M	43	Hispanic	Head trauma
1066	M	60	Caucasian	Cerebrovascular accident
1069	M	39	Caucasian	Cerebrovascular accident
1075	M	56	Caucasian	Cerebrovascular accident
1077	F	57	Caucasian	Head trauma
1078	F	66	Caucasian	Head trauma
1079	M	41	Caucasian	Anoxia
1081	M	55	Caucasian	Cerebrovascular accident
1082	F	66	Caucasian	Cerebrovascular accident
1083	M	68	African American	Cerebrovascular accident
1084	M	52	Caucasian	Cerebrovascular accident
1086	M	63	Caucasian	Cerebrovascular accident
1087	M	51	African American	Cerebrovascular accident
1088	F	61	Caucasian	Cerebrovascular accident
1089	M	55	Caucasian	Anoxia
1090	M	49	Caucasian	Cerebrovascular accident
1091	M	74	Caucasian	Cerebrovascular accident
1093	F	48	Caucasian	Cerebrovascular accident
1094	M	59	African American	Cerebrovascular accident
1095	F	60	Caucasian	Cerebrovascular accident
1097	M	36	Caucasian	Cerebrovascular accident
1098	M	54	Caucasian	Head trauma

Donor Information

Sample	Gender	Age (Yrs)	Race	Cause of Death
1099	M	65	Caucasian	Cerebrovascular accident
1101	F	47	Caucasian	Anoxia
1102	M	48	Caucasian	Cerebrovascular accident
1104	M	51	Caucasian	Anoxia
1105	M	62	Caucasian	Anoxia
1106	F	20	Caucasian	Cerebrovascular accident
1107	F	55	Caucasian	Cerebrovascular accident
1108	F	45	African American	Cerebrovascular accident
1113	M	59	Caucasian	Anoxia
1114	M	39	Caucasian	Head trauma
1115	M	56	Caucasian	Head trauma
1117	F	66	Caucasian	Cerebrovascular accident
1119	M	44	Caucasian	Cerebrovascular accident
1120	M	49	Caucasian	Cerebrovascular accident
1121	M	60	Caucasian	Cerebrovascular accident
1130	F	65	Caucasian	Cerebrovascular accident
1131	M	52	Caucasian	Head Trauma
1155	F	43	Caucasian	Cerebrovascular accident
1157	F	59	Hispanic	Head trauma
1161	F	60	Caucasian	Anoxia
1360	M	53	Caucasian	Cerebrovascular accident
1361	M	46	Caucasian	Anoxia
1363	M	51	Caucasian	Head trauma
1372	M	39	Caucasian	Cerebrovascular accident

Serology information

- Cytomegalovirus: 125 of 200 donors tested positive and 2 donors were not determined.
- RPR*: All donors tested negative.
- HIV, HTLV, HbsAg, and HCV**: All donors tested negative.

* Rapid Plasma Reagin

** Antibody to Human Immunodeficiency Virus, Antibody to Human T Cell Lymphotropic Virus, Hepatitis B Surface Antigen, Antibody to Hepatitis C Virus, respectively.