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Supplementary material

CYP family	Function	Category	CYP Isoform
CYP1	Drug and steroid (especially estrogen) metabolism	3 subfamilies, 3 genes, 1 pseudogene	CYP1A1 CYP1A2 CYP1B1
CYP2	Drug and steroid metabolism	13 subfamilies, 16 genes, 16 pseudogenes	CYP2A6 CYP2A7 CYP2A13 CYP2B6 CYP2C8 CYP2C9 CYP2C18 CYP2C19 CYP2D6 CYP2E1 CYP2F1 CYP2J2 CYP2R1 CYP2S1 CYP2U1 CYP2W1
CYP3	Drug and steroid (including testosterone) metabolism	1 subfamily, 4 genes, 2 pseudogenes	CYP3A4 CYP3A5 CYP3A7 CYP3A43
CYP4	Arachidonic acid or fatty acid metabolism	6 subfamilies, 11 genes, 10 pseudogenes	CYP4A11 CYP4A22 CYP4B1 CYP4F2 CYP4F3 CYP4F8 CYP4F11 CYP4F12 CYP4F22 CYP4V2 CYP4X1 CYP4Z1
CYP5	Thromboxane A2 synthase	1 subfamily, 1 gene	CYP5A1
CYP7	Bile acid biosynthesis 7-alpha hydroxylase of steroid nucleus	2 subfamilies, 2 genes	CYP7A1 CYP7B1
CYP8	Varied	2 subfamilies, 2 genes	CYP8A1 (prostacyclin synthase), CYP8B1 (bile acid biosynthesis)
CYP11	Steroid biosynthesis	2 subfamilies, 3 genes	CYP11A1 CYP11B1 CYP11B2
CYP17	Steroid biosynthesis, 17-alpha hydroxylase	1 subfamily, 1 gene	CYP17A1
CYP19	Steroid biosynthesis: aromatase synthesizes estrogen	1 subfamily, 1 gene	CYP19A1
CYP20	Unknown function	1 subfamily, 1 gene	CYP20A1
CYP21	Steroid biosynthesis	2 subfamilies, 2 genes, 1 pseudogene	CYP21A2
CYP24	Vitamin d degradation	1 subfamily, 1 gene	CYP24A1
CYP26	Retinoic acid hydroxylase	3 Subfamilies, 3 genes	CYP26A1 CYP26B1 CYP26C1

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CYP27	Varied	3 subfamilies, 3 genes	CYP27A1 (bile acid biosynthesis), CYP27B1 (vitamin D3 1-alpha hydroxylase, activates vitamin D3) CYP27C1 (unknown function)
CYP39	7-alpha hydroxylation of 24-hydroxycholesterol	1 subfamily, 1 gene	CYP39A1
CYP46	Cholesterol 24-hydroxylase	1 subfamily, 1 gene	CYP46A1
CYP51	Cholesterol biosynthesis	1 subfamily, 1 gene, 3 pseudogenes	CYP51A1 (lanosterol 14-alpha demethylase)

Table 1: Classification of the CYP family on the basis of CYP isoform and function is given.

S. No.	Name of medicinal plant	Herbal component and Chemical formula	IUPAC name	PubChem CID*
1.	St.John's wort (*Hypericum perforatum*)	Hyperforin $C_{35}H_{52}O_4$	4-Hydroxy-5-isobutyryl-6-methyl-1,3,7-tris-(3-methyl-but-2-enyl)-6-(4-methyl-pent-3-enyl)-bicyclo[3.3.1]non-3-ene-2,9-dione	5288591
2.	Garlic (*Allium sativum*)	Allicin $C_6H_{10}OS_2$	3-prop-2-enylsulfinylsulfanylprop-1-ene	65036
3.	Piperine (*Piper nigrum*)	Piperine $C_{17}H_{19}NO_3$	(2E,4E)-5-(1,3-benzodioxol-5-yl)-1-piperidin-1-ylpenta-2,4-dien-1-one	638024
4.	Ginseng (*Panax ginseng*)	Ginsenoside $C_{30}H_{52}O_2$	(3S,5R,8R,9R,10R,14R,17S)-17-(2-hydroxy-6-methylhept-5-en-2-yl)-4,4,8,10,14-pentamethyl-2,3,5,6,7,9,11,12,13,15,16,17-dodecahydro-1H-cyclopenta[a]phenanthren-3-ol	3086007
5.	Gingko (*Ginkgo biloba*)	Ginkgolic acid $C_{22}H_{34}O_3$	2-hydroxy-6-[(Z)-pentadec-8-enyl]benzoic acid	5281858

Table 2: Medicinal plants with their herbal components, IUPAC name, Chemical structure and PubChem CID number. (Note: * = PubChem compound identity descriptor number (http://pubchem.ncbi.nlm.nih.gov/)).

S. No.	Medicinal plant	Herbal constituent and chemical formula	Drug	Experimental model	CYP enzyme involved (isoform)	Symptom of interaction	Mechanism
1.	St. John's wort (*Hypericum perforatum*)	Hyperforin $C_{35}H_{52}O_4$	Ciclosporin	Human hepatocytes	CYP3A4, 2E1, 2C19	Reduction in serum	Induction of p-glycoprotein
2.	St. John's wort (*Hypericum perforatum*)	Hyperforin $C_{35}H_{52}O_4$	Warfarn	Human clinical trail	CYP3A4	Loss of anticoagulant activity	Inhibition of CYP activity
3.	St. John's wort (*Hypericum perforatum*)	Hyperforin $C_{35}H_{52}O_4$	Omeprazole	Human clinical trail	CYP2C19	Decreases Plasma concentration	Induction of CYP2C19 , 3A4
4.	Garlic (*Allium sativum*)	Allicin $C_6H_{10}OS_2$	Sequinavir	Human clinical trail	CYP3A4	Reduction of hypertension	Inhibition of CYP2C9, 2C19, 3A4
5.	Garlic (*Allium sativum*)	Allicin $C_6H_{10}OS_2$	Sequinavir	Human clinical trail	CYP2C9, 2C19	Reduction of hypertension and hyperlipidameia	Inhibition of CYP2C9, 2C19

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6.	Black Pepper (*Piper nigrum*)	Piperine $C_{17}H_{19}NO_3$	Antimicrobial	*In vivo* studies in rat	CYP2E1	suppressed CYP2E1 expression	Induce activity of CYP 1A , 2B
7.	Ginseng (*Panax ginseng*)	Ginsenoside $C_{42}H_{72}O_{14}$, Ginsenoide	Phenelzine	*In vitro* studies in mouse and human microsomes	CYP2E1	Induce CYP3A4, 2D6, 2C19 , 2C9 activity	Inhibition of CYP2E1 activity
8.	Gingko (*Gingko biloba*)	Ginkgolic acid $C_{22}H_{34}O_3$	Diltiazem	*In vitro* and *in vivo* analysis on rat hepatic and intestinal CYP enzymes	CYP3A, 2B	Inhibit metabolism of Diltiazem (drug)	Induces CYP2B and inhibit CYP1A2, C9 2C19

Table 3: Assessment of herbal components on drug interactions and effects on CYP activities

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