SUPPLEMENTARY INFORMATION

ARTICLE TITLE **Saponins as cytotoxic agents – an update (2010-2021). Part II - Triterpene saponins**

Phytochemistry Reviews

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Table S1 Cytotoxic triterpene saponins (2010–2021)

Source	Compound	Cell line	Concentration / exposure time	Assay	Reference
Acacia albida roots	albidoside A	HEp-2	IC_{50} [µM/L] 72 h 8.91	MTT assay	(Guo et al. 2020)
Acacia polyacantha leaves	polyacanthoside A doxorubicin (positive control)	CCRF-CEM CCRF-CEM	IC_{50} [µM] 72 h 8.90±0.58 0.02±0.00	alamarBlue assay	(Fotso et al. 2019)
Actaea asiatica rhizomes	actatica G 5-FU	HT-29 HT-29	IC_{50} [µM] 48 h 9.2±3.0 3.0±2.1	MTT assay	(Hu et al. 2021)

	(positive control)				
Actaea cimicifuga roots	25-*O*-acetylcimigenol-3-*O*-[2′-*O*-(*E*)-2-butenoyl]-β-D-Xyl 25-*O*-acetylcimigenol-3-*O*-[4'-*O*-(*E*)-2-butenoyl]-β-D-Xyl 25-*O*-acetylcimigenol-3-*O*-[3′-*O*-acetyl]-β-D-Xyl 25-*O*-acetylcimigenol-3-*O*-[4′-*O*-acetyl]-β-D-Xyl asiaticoside A cisplatin (positive control)	HepG2 HepG2 HepG2 HepG2 HepG2 HepG2	IC_{50} [μM] 72 h 6.37 1.29 0.71 2.80 4.02 1.73	MTT assay	(Nian et al. 2010)
Actaea cimicifuga roots	3-*O*-β-D-Xyl 25-*O*-methyl-24-*O*-acetylisodahurinol 3-*O*-β-D-Xyl-3'-*O*-β-D-Xyl 2'-*O*-acetylcimigenol cisplatin (positive control)	HL-60 SMMC-7721 A549 MCF-7 SW480 HL-60 SMMC-7721 MCF-7 HL-60 SMMC-7721 A549 MCF-7 SW480	IC_{50} [μM] 48 h 3.32 3.17 2.61 2.93 3.11 8.00 8.93 8.66 1.01 5.29 6.13 13.62 14.03	MTT assay	(Zhu et al. 2016)
Actaea cimicifuga rhizomes	acteol-3-*O*-2′-*O*-[(*E*)-2-butenoyl]-β-D-Xyl 25-*O*-acetylcimigenol-3-*O*-[2′-*O*-3-methoxy-3-oxo-	A549 SMMC-7721 A549 SMMC-7721	IC_{50} [μM] ^{dng} 7.64 5.86 9.87 4.02	MTT assay	(Lu et al. 2019)

	propionyl]-β-D-Xyl cisplatin (positive control)	 A549 SMMC-7721	 14.72 5.00		
Actaea dahurica roots	cimdahxynoside F cimdahxynoside H cimdahxynoside I 24-acetylisodahurinol-3-*O*-β-D-Xyl 24-*O*-acetylhydroshengmanol 3-*O*-β-D-Xyl-Δ16,17-enol ether shengmanol Xyl 7,8-didehydrocimigenol-3-*O*-β-D-Gal	 A2780 H7402 HCT-8 HeLa MCF-7 A2780 HeLa H7402 HeLa MCF-7 H7402 HeLa MCF-7 HeLa A2780 H7402 HCT-8 HeLa MCF-7 A2780 H7402 HeLa MCF-7	IC_{50} [μM] 72 h 7.1±1.7 8.4±1.8 7.2±1.0 6.6±0.4 9.9±3.2 6.9±0.8 7.2±1.9 7.4±0.5 9.8±2.7 8.5±1.6 6.0±0.8 3.9±0.8 9.8±3.3 5.2±2.0 6.9±1.1 7.1±1.2 8.1±1.1 6.6±1.8 6.8±0.5 5.9±0.1 7.5±1.1 6.3±0.3 8.3±1.8	MTT assay	(Wang et al. 2019)

	taxol (positive control)	A2780 H7402 HCT-8 HeLa MCF-7	0.07 0.4 0.3 0.03 0.4		
Actinostemma lobatum herb	lobatoside L tubeimoside III cisplatin (positive control)	ECA-109 ECA-109 ECA-109	IC_{50} [µM] 48 h 8.25 3.71 15.34	MTT assay	(Li et al. 2012b)
Actinostemma lobatum herb	lobatoside O cisplatin (positive control)	HCT 116 MCF-7 HCT 116 MCF-7	IC_{50} [µM] 48 h 8.61 7.58 8.97 11.87	MTT assay	(Cao et al. 2015)
Aegricas corniculatum leaves	sakurasosaponin sakurasosaponin methyl ester mitomicin C (positive control)	MCF-7 A549 B16F10 HCT 116 MCF-7 A549 HCT 116 MCF-7 A549 B16F10 HCT 116	IC_{50} [µM] 48 h 9.85±0.14 2.89±0.02 4.96±0.67 3.40±0.48 9.86±0.21 5.45±0.13 2.21±0.05 2.73±1.37 0.74±0.05 5.67±0.70 2.82±0.08	MTT assay	(Vinh et al. 2019)
Aesculus chinensis seeds	escin IIIa cisplatin (positive control)	MCF-7 MCF-7	IC_{50} [µM] 48 h 7.1 13.0	MTT assay	(Cheng et al. 2018)

Aesculus pavia aerial parts	pavioside A pavioside B pavioside C pavioside D pavioside E pavioside F pavioside G pavioside H	J-774 WEHI-164 J-774 WEHI-164 J-774 WEHI-164 J-774 WEHI-164 J-774 WEHI-164 J-774 WEHI-164 J-774 WEHI-164 J-774 WEHI-164	IC_{50} [μg/mL] 72 h 5.7 4.8 5.1 4.9 5.7 6.5 6.6 7.1 2.9 2.1 2.8 2.3 3.6 3.5 3.5 3.2	MTT assay	(Lanzotti et al. 2012)
Aesculus sylvatica seeds	aesculioside S2 doxorubicin (positive control)	PC-3 PC-3	GI_{50} [μM] 48 h 8.7±2.5 0.81±0.06	CCK-8 assay	(Yuan et al. 2015)
Albizia anthelmintica leaves	β-D-Xyl-(1→4)-6-deoxy-α-L-Man-(1→2)-1-*O*-{(3β)-28-oxo-3-[(2-*O*-β-D-Xyl-β-D-Glc)oxy]olean-12-en-28-yl}-β-D-Glc 1-*O*-[(3β)-28-oxo-3-{[β-D-Xyl-(1→2)-α-L-Ara-(1→6)-2-acetamido-2-deoxy-β-Glc]oxy}olean-12-en-28-yl]-β-	HCT 116 HepG2	IC_{50} [μM] 48 h 4.75 3.60	MTT assay	(Al-Sayed et al. 2016)

	D-Glc				
Albizia chinensis stem bark	 albizoside D albizoside E paclitaxel (positive control)	 HCT-8 BEL-7402 BGC-823 A549 A2780 BEL-7402 BGC-823 A549 A2780 HCT-8 BEL-7402 BGC-823 A549 A2780	IC_{50} [μM] 96 h 7.70±0.15 0.70±0.08 0.08±0.02 0.30±0.07 0.90±0.05 0.60±0.03 0.30±0.04 1.20±0.14 0.30±0.09 0.05±0.02 0.12±0.04 0.03±0.02 0.02±0.04 0.05±0.03	MTT assay	(Liu et al. 2010)
Albizia julibrissin stem bark	 julibroside L taxol (positive control)	 BGC-823 A549 HCT 116 HepG2 BGC-823 A549 HCT 116 HepG2	IC_{50} [μM] 48 h 5.77±0.55 4.80±0.15 4.26±0.16 4.93±0.21 0.052±0.01 0.026±0.006 0.03±0.008 0.045±0.01	MTT assay	(Han et al. 2021)
Albizia lebbeck roots	 lebbeckosides A lebbeckosides B tamoxifen	 U-87 MG TG1 GSCs U-87 MG TG1 GSCs U-87 MG TG1 GSCs	IC_{50} [μM] 24 h 3.46±0.10 1.36±0.07 2.10±0.05 2.24±0.18 31±2 14±2	CellTiter Glo luminescent cell viability assay	(Noté et al. 2015)
Albizia lebbeck stem bark	 lebbeckoside C	 U-87 MG	IC_{50} [μM] 24 h 1.69	CellTiter Glo luminescent cell	(Noté et al. 2019)

		TG1	1.44	viability assay	
	tamoxifen	U-87 MG	31		
	(positive control)	TG1	14		
Albizia procera			IC_{50} [µM] 48 h	MTT assay	(Zhang et al. 2018a)
bark	proceraoside B	HL-60	0.9±0.11		
		AZ521	1.7±0.24		
		SK-BR-3	0.4±0.02		
		A549	1.3±0.28		
		WI38	2.5±0.02		
	proceraoside D	HL-60	0.9±0.09		
		AZ521	1.2±0.13		
		SK-BR-3	0.8±0.06		
		A549	1.0±0.08		
		WI38	8.3±0.12		
	proceraoside E	HL-60	0.5±0.04		
		AZ521	0.4±0.01		
		SK-BR-3	1.1±0.04		
		A549	0.66±0.2		
		WI38	2.2±0.47		
	proceraoside F	HL-60	0.3±0.01		
		AZ521	0.5±0.04		
		SK-BR-3	1.3±0.30		
		A549	0.3±0.02		
		WI38	5.1±0.41		
	proceraoside G	HL-60	0.6±0.06		
		AZ521	0.6±0.08		
		SK-BR-3	2.6±0.54		
		A549	1.8±0.11		
		WI38	4.8±0.65		
	cisplatin	HL-60	4.2±1.12		
	(positive control)	AZ521	9.5±0.52		
		SK-BR-3	>10		
		A549	>10		
		WI38	>10		

Androsace umbellata aerial parts	saxifragifolin A doxorubicin (positive control)	HepG2/ADM MDA-MB-231 HepG2/ADM MDA-MB-231	IC_{50} [µM] 72 h 9.97±0.46 9.29±0.32 143.62±5.12 21.13±0.15	MTT assay	(Yin et al. 2017)
Anemone chapaensis roots and aerial parts	prosapogenin CP6 doxorubicin (positive control)	PANC-1 NCI-N87 RD MIA Paca-2 PANC-1 NCI-N87 RD MIA Paca-2	IC_{50} [µM] [dng] 7.5 5.4 7.5 2.7 1.5 1.9 0.3 2.8	MTT assay	(Huong et al. 2019)
Anemone flaccida rhizome	Hedera saponin flaccidoside II	BEL-7402 HeLa + LPS BEL-7402 HepG2	IC_{50} [µM/L] 24 h 9.90 8.14 8.41 8.92	MTT assay	(Han et al. 2013)
Anemone raddeana	raddeanin A	HCT 116	IC_{50} [µM] 12 h 2.61	MTT assay	(Meng et al. 2019)
Anemone raddeana	raddeanin A	SW480 LoVo Caco-2 HT-29	IC_{50} [µM] 24 h 2.898 48 h 1.810 24 h 2.134 48 h 1.008 24 h 4.027 48 h 3.297 24 h 9.654 48 h 2.835	MTT assay	(Wang et al. 2018)
Anemone raddeana	raddeanin A	BGC-823 SGC-7901	IC_{50} [µM] 12 h 5.34 6.61	MTT assay	(Xue et al. 2013)

		MKN-28	4.98		
Anemone raddeana roots	hederacolchiside A1 doxorubicin (positive control)	CFPAC-1 Hep3B HT-29 KB ECA-109 SPC-A-1 SGC-7901 5637 HL-60 U-251 MG	IC_{50} [μM] 72 h 0.29-3.48 not mentioned	MTT assay	(Zhao et al. 2018)
Anemone raddeana rhizomes	hederacolchiside A1 raddeanoside 23 oleanolic acid 3-*O*-β-D-Glc-(1→3)-α-L-Rha-(1→2)-[β-D-Glc-(1→4)]-α-L-Ara 5-FU (positive control)	A549 PANC-1 PANC-1 A549 PANC-1	IC_{50} [μM] 72 h 8.19 4.47 8.97 2.98 6.03	MTT assay	(Lv et al. 2021)
Anemone rivularisi var. *flore-minore* rhizome	Pulsatilla saponin D 3-*O*-β-D-Xyl-(1→3)-α-L-Rha-(1→2)-[β-D-Glc-(1→4)]-α-L-Ara oleanolic acid doxorubicin (positive control)	HL-60 HL-60 A549 HL-60 A549	IC_{50} [μM] 48 h 9.57±0.54 7.25±0.31 9.89±0.57 0.35±0.05 0.68±0.10	MTT assay	(Wang et al. 2014)
Antonia ovata stem bark	antonioside A	KB	IC_{50} [μM] 48 h 4.0±0.04	WST-1 assay	(Magid et al. 2010)

	antonioside B antonioside C camptothecin (positive control)	KB KB KB	6.6±0.54 3.1±0.02 0.3±0.02		
Antonia ovata leaves	 antonioside E antonioside G antonioside H camptothecin (positive control)	 KB KB KB KB	IC_{50} [μM] 48 h 3.3±0.04 3.8±0.12 5.3±0.24 0.3	WST-1 assay	(Magid et al. 2012)
Aralia chinensis leaves	 3β-hydroxyolean-12-ene-28-oic acid 3-*O*-β-D-GlcA 28-*O*-β-D-Glc ester ellipticine (positive control)	 KB HepG2 KB HepG2	IC_{50} [μM] 72 h 8.1±0.1 9.5±0.3 1.3±0.1 1.5±0.1	MTT assay	(Yen et al. 2020)
Aralia elata leaves	 3-*O*-β-D-Glc-(1→3)-β-D-Glc-(1→3)-β-D-Glc oleanolic acid 3-*O*-[β-D-Glc-(1→3)-α-L-Ara echinocystic acid 3-*O*-α-L-Ara echinocystic acid etoposide (positive control)	 HL-60 A549 HL-60 HL-60 HL-60 A549	IC_{50} [μM] 48 h 6.99±1.73 7.93±0.83 5.75±2.00 7.51±1.35 1.66±0.57 8.56±0.67	MTT assay	(Zhang et al. 2012b)
Aralia elata leaves	 3-*O*-{β-D-Glc-(1→3)-β-D-Glc-(1→3)-[β-D-Glc-(1→2)]-β-D-Glc}-echinocystic acid 28-*O*-β-D-Glc ester	 A549	IC_{50} [μM] 48 h 9.9±1.5	MTT assay	(Kuang et al. 2013)

	5-FU (positive control)	A549	11.7±3.6		
Ardisia crenata roots	ardisicrenoside A ardicrenin paclitaxel (positive control)	MCF-7 A549 MCF-7 HepG2 A549 MCF-7 HepG2	IC_{50} [μM/L] 24 h 5.60±0.54 1.17±0.01 1.19±0.06 3.52±0.23 5.38±0.25 5.07±0.07 8.44±0.83	MTT assay	(Song et al. 2021)
Ardisia gigantifolia rhizomes	3β-*O*-α-L-Rha-(1→3)-[β-D-xylopyranosyl-(1→2)]-β-D-Glc-(1→4)-[β-D-Glc-(1→2)]-α-L-Ara-16α-hydroxy-13,28-epoxy-oleanane	BCG-823	IC_{50} [μM] 48 h 6.9	MTT assay	(Mu et al. 2010)
Ardisia gigantifolia rhizome*s*	3β-*O*-α-L-Rha-(1→3)-[β-D-Xyl-(1→2)]-β-D-Glc-(1→4)-[β-D-Glc-(1→2)]-α-L-Ara 16α-hydroxy-13,28-epoxy-oleanane 3β-*O*-α-L-Rhal-(1→3)-[β-D-Xyl-(1→2)]-β-D-Glc-(1→4)-[β-D-Glc-(1→2)]-α-L-Ara-16α-hydroxy-13,28-epoxy-oleanane 3β-*O*-α-L-Rha-(1→3)-[β-D-Xyl-(1→2)]-β-D-Glc-(1→4)-[6-OAc-β-D-Glc-(1→2)]-α-L-Ara-16α-hydroxy-13,28-epoxy-oleanane 3β-*O*-β- D-Xyl-(1→2)-β-D-	A549 BEL-7402 BEL-7402 A549 BEL-7402 HCT-8 A549	IC_{50} [μM] 48 h 8.15±0.81 7.83±0.32 0.86±0.12 8.06±0.62 8.4±0.76 9.28±0.30 4.37±0.13	MTT assay	(Mu et al. 2013a)

	Glc-(1→4)-[β-D-Glc-(1→2)]-α-L-Ara-16α-hydroxy-13,28-epoxy-oleanane	BEL-7402	6.77±0.20		
	3β-*O*-α-L-Rha-(1→3)-[β-D-Glc(1→3)-β- D-Xyl-(1→2)]-β-D-Glc-(1→4)-[β-D-Glc-(1→2)]-α-L-Ara 16α-hydroxy-13,28-epoxy-30-acetoksy oleanane	A549 BEL-7402 HCT-8	6.33±0.15 2.71±0.31 5.73±0.25		
	3β-*O*-{α-L-Rha-(1→3)-[β-D-Glc(1→3)-β-D-Xyl-(1→2)]-β-D-Glc-(1→4)-[β-D-Glc-(1→2)]-α-L-Ara}-16α,30-dihydroxy-13β,28-epoxy-oleanane	HCT-8	8.63±0.64		
	3β-*O*-{α-L-Rha-(1→3)-[β-D-Glc(1→3)-β-D-Xyl-(1→2)]-β-D-Glc-(1→4)-[β-D-Glc-(1→2)]-α-L-Ara}-30-hydroxy-16-oxo-13,28-epoxy-oleanane	A549 BEL-7402 HCT-8	3.77±0.25 3.6±0.40 3.41±0.15		
	cyclamiretin A 3β-*O*-{α-L-Rha-(1→3)-[β-D-Xyl-(1→2)]-β-D-Glc-(1→4)-[β-D-Glc-(1→2)]-α-L-Ara}	BEL-7402	1.58±0.23		
	cyclamiretin A 3β-*O*-{α-L-Rha-(1→3)-[β-D-Glc(1→3)-β-D-Xyl-(1→2)]-β-D-Glc-(1→4)-[β-D-Glc-(1→2)]-α-L-Ara}	A549 BEL-7402 HCT-8	3.2±0.34 3.2±0.51 2.0±0.10		
	cyclamiretin A 3β-*O*-{α-L-Rha-	A549	7.52±0.75		

	(1→3)-[β-D-Xyl-(1→2)]-β-D-Glc-(1→4)-[6-OAc-β-D-Glc-(1→2)]-α-L-Ara} 3β-*O*-α-L-Rha-(1→3)-[β- D-Xyl-(1→2)]-β-D-Glc-(1→4)-α-L-Ara-16-oxo-13,28-epoxy-olean-30-al cyclamiretin A 3β-*O*-β- D-Xyl-(1→2)-β-D-Glc-(1→4)-α-L-Ara 3β-*O*-β-D-Glc-(1→4)-[β-D-Glc-(1→2)]-α-L-Ara-30(S)-3β,16α-dihydroxy-30-butoxy-28,30-epoxyolean-12-en 5-FU (positive control)	BEL-7402 HCT-8 BEL-7402 HCT-8 HCT-8 BEL-7402 A549 BEL-7402 HCT-8	7.76±0.09 4.1±0.23 6.9±0.70 7.73±0.46 8.43±0.18 7.34±0.72 8.92±0.23 8.3±0.41 6.92±0.56		
Ardisia gigantifolia rhizomes	3-*O*-β-D-Glc-(1→3)-β-D-Xyl-(1→2)-[α-L-Rha-(1→3)]-β-D-Glc-(1→4)-[β-D-Glc-(1→2)]-α-L-Ara-3β,16α,28,30-tetrahydroxy-olean-12-ene 3β-*O*-β-D-Glc-(1→3)-β-D-Xyl-(1→2)-[α-L-Rha-(1→3)]-β-D-Glc-(1→4)-[β-D-Glc-(1→2)]-α-L-Ara-16a-hydroxy-13,28-epoxy-oleanane lysikoianoside	BCG HeLa EJ HepG2 BCG HeLa EJ HepG2 BCG HeLa EJ	IC_{50} [μM] 48 h 6.5±0.21 7.7±0.22 6.7±0.15 8.7±0.18 3.1±0.12 3.3±0.23 3.6±0.15 3.2±0.22 8.1±0.32 7.3±0.13 7.2±0.21	MTT assay	(Mu et al. 2013b)

		HepG2	5.8±0.12		
	3β-*O*-β-D-Glc-(1→3)-β-D-Xyl-(1→2)-[α-L-Rha-(1→3)]-β-D-Glc-(1→4)-[β-D-Glc-(1→2)]-α-L-Ara cyclamiretin A	BCG HeLa EJ HepG2	6.7±0.23 8.1±0.33 9.2±0.19 8.7±0.25		
	cisplatin (positive control)	BCG HeLa EJ HepG2	14.8±0.71 10.9±0.52 12.4±0.51 12.8±0.45		
Ardisia gigantifolia rhizome*s*			IC_{50} [μM] 48 h	CCK-8 assay	(Mu et al. 2015)
	cyclamiretin A	BEL-7402 HepG2 SMMC-7721 L02	1.38±0.18 3.47±0.55 2.24±0.39 1.39±0.39		
	epirubicin (positive control)	BEL-7402 HepG2 SMMC-7721 L02	4.77±0.62 2.49±0.57 1.75±0.82 8.72±0.42		
Ardisia gigantifolia rhizome*s*			IC_{50} [μM] 24 h	MTT assay	(Mu et al. 2020)
	AG8	MDA-MB-231 MDA-MB-157 BT-549	3.80 1.38 0.73		
Ardisia japonica whole plant			IC_{50} [μM] 72 h	MTT assay	(Li et al. 2012a)
	ardisianoside B	A549 H157 H446 SGC-7901 MKN-45 BEL-7402 HepG2 Caco-2 DU145	4.47±0.15 5.09±0.31 6.63±0.24 5.37±0.09 8.39±0.13 0.92±0.18 2.98±0.84 7.19±0.20 6.17±0.14		
	3β-*O*-β-D-Glc-(1→2)-[α-L-Rha-(1→2)-β-D-Glc-(1→4)]-α-L-Ara 13β,28-epoxy-16α -hydroxyoleanane	A549 H157 H446 LTEP-a-2	4.41±0.31 5.21±0.22 7.74±0.35 7.92±0.26		

		SGC-7901 MKN-45 BEL-7402 HepG2 Caco-2 OVCAR-3 DU145	5.88±0.26 6.23±0.20 1.18±0.21 3.17±0.55 7.66±0.13 8.22±0.25 0.75±0.15		
	epirubicin (positive control)	A549 H157 H446 LTEP-a-2 NCI-H460 SGC-7901 MKN-45 BEL-7402 HepG2 MCF-7 Bcap-37 Caco-2 HCT 116 OVCAR-3 DU145	0.88±0.17 1.72±0.11 2.35±0.38 3.41±0.48 6.74±0.70 0.51±0.12 0.66±0.23 1.23±0.36 2.23±0.81 1.25±0.54 0.89± 0.33 0.41±0.03 0.57±0.08 0.75±0.15 4.01±0.56		
Asterothamnus centrali-asiaticus aerial parts	durantanin II taxol (positive control)	HepG2 HepG2	IC_{50} [µg/mL] 24 h 6.86 7.17	MTT assay	(Wang et al. 2016)
Astragalus stereocalyx roots	3-*O*-β-D-Glc-16-*O*-β-D-Glc-3β,6α,16β,24(R),25-pentahydroxycycloartane	HeLa	IC_{50} [µM] 48 h 10	MTT assay	(Yalçın et al. 2012)
Atriplex glauca var. *ifiniensis* roots	3-*O*-β-D-Glc-(1→2)-β-D-Gal saikogenin F paclitaxel (positive control)	HT-29 HCT 116 HT-29 HCT 116	IC_{50} [µM] ^{dng} 7.08 9.47 1.60 2.05	MTT assay	(Jabrane et al. 2011)
Avicennia marina fruits	ilekudinoside B ester	GSC-18#	IC_{50} [µg/mL] 72 h 5.53	MTT assay	(Yang et al. 2018)

Bellis perennis flowers	perennisaponin E perennisaponin L perennisaponin N perennisaponin O cisplatin (positive control) 5-FU (positive control) doxorubicin (positive control) camptothecin (positive control)	MKN-45 MKN-45 MKN-45 MKN-45 MKN-45 MKN-45 MKN-45 MKN-45	IC_{50} [μM] 48 h 9.7 7.7 5.3 6.9 100 >100 0.12 0.10	MTT assay	(Ninomiya et al. 2016)
Butyrospermum parkii root barks	parkioside B cisplatin (positive control)	T98G MDA-MB-231 A375 T98G MDA-MB-231 A375 HCT 116	IC_{50} [μM] 72 h 2.93 9.62 2.74 7.79 6.89 0.50 8.75	MTT assay	(Tapondjou et al. 2011)
Camellia oleifera seed cake	oleiferasaponin B1 oleiferasaponin B2 mitoxantrone (positive control)	HCT-15 A549 SK-OV-3 SK-MEL-2 HCT-15 A549 SK-OV-3 SK-MEL-2	IC_{50} [μM] 24 h 1.6±0.3 8.4±0.8 6.3±0.5 9.2±0.6 0.8±0.06 0.2±0.01 5.8±0.3 7.2±0.5	SRB assay	(Zhou et al. 2014)

		HCT-15	3.8±0.7		
Camellia oleifera			IC_{50} [μM] 72 h	MTT assay	(Zong et al. 2016)
seed cake	oleiferasaponin C4	HL-60	6.489		
	oleiferasaponin C5	BEL-7402	4.218		
		BGC-823	5.505		
		MCF-7	3.915		
	taxol	HL-60	1.797		
	(positive control)	KB	3.468		
Camellia oleifera			IC_{50} [μM] 72 h	MTT assay	(Fu et al. 2018)
seeds	oleiferasaponin D1	HCT 116	8.33±0.75		
		HepG2	6.11±0.64		
		BGC-823	9.53±0.34		
		NCI-H1650	7.85±0.55		
		A2780	6.48±0.52		
	oleiferasaponin D2	HepG2	8.52±0.64		
		BGC-823	4.86±0.53		
		NCI-H1650	3.31±1.17		
		A2780	8.49±0.73		
	paclitaxel	HCT 116	0.0524±0.0022		
	(positive control)	HepG2	0.00601±0.00073		
		BGC-823	0.00333±0.0025		
		NCI-H1650	0.00425±0.0037		
		A2780	0.00844±0.0095		
Camellia reticulata			IC_{50} [μM] 48 h	MTT assay	(Chen et al. 2018)
twigs and leaves	dianshanchaoside B	HL-60	0.93		
		A549	7.89		
		SMMC-7721	9.49		
		MCF-7	4.56		
		SW480	8.73		
	dianshanchaoside C	HL-60	0.78		
		A549	3.35		
		SMMC-7721	3.49		
		MCF-7	3.57		
		SW480	2.54		

	dianshanchaoside D	HL-60 A549 SMMC-7721 MCF-7 SW480	0.54 2.98 3.21 3.36 2.53		
	sasanquasaponin III	HL-60 A549 SMMC-7721 MCF-7 SW480	0.70 3.11 2.89 3.44 2.98		
	maetenoside B	HL-60 A549 SMMC-7721 MCF-7 SW480	0.70 3.10 3.32 3.43 1.20		
	sanchakasaponin F	HL-60 A549 SMMC-7721 MCF-7 SW480	0.54 3.10 3.42 3.30 1.74		
	sanchakasaponin E	HL-60 A549 SMMC-7721 MCF-7 SW480	0.54 3.03 2.56 3.34 1.92		
	DDP (positive control)	HL-60 A549 SMMC-7721 MCF-7 SW480	3.86 20.78 33.25 34.75 16.14		
Cephalaria sp.	 aristatoside C davisianoside B	 A549 A549	IC_{50} [μM] 48 h 3.52±0.11 4.08±0.06	MTT assay	(Sarikahya et al. 2018)

	doxorubicin (positive control)	A549	7.23±0.07		
Cephalaria taurica aerial parts (compounds obtained through alkaline hydrolysis)	3-*O*-β-D-Glc-(1→4)-β-D-Glc-(1→3)-[α-L-Rha-(1→2)]-β-D-Xyl-(1→3)-α-L-Rha-(1→2)-α-L-Ara hederagenin 3-*O*-β-D-Glc-(1→4)-β-D-Glc-(1→3)-[α-L-Rha-(1→2)]-β-D-Xyl-(1→3)-α-L-Rha-(1→2)-α -L-Ara hederagenin doxorubicin (positive control)	SH-SY5Y A549 HeLa PANC-1 SH-SY5Y HEK-293 A549 HeLa PANC-1 SH-SY5Y HEK-293	IC_{50} [μM] 48 h 7.49±1.08 9.04±1.29 8.75±0.99 6.87±0.42 4.32±1.12 9.80±0.10 13.96±0.64 10.45±0.31 15.89±1.99 4.69±0.04 25.85±3.97	MTT assay	(Ozer et al. 2018)
Chenopodium hybridum aerial parts	3-*O*-L-Rha-(1→2)-L-Ara serjanic acid 28-*O*-D-Glc ester 3-*O*-L-Ara serjanic acid 28-*O*-D-Glc ester doxorubicin (positive control)	HTB140 DU145 HT-29 HTB140 DU145 HT-29	IC_{50} [μg/mL] 48 h 7.95 48 h 7.25 48 h 6.48 24 h 5.71 24 h 3.18 24 h 1.53	LDH assay	(Grabowska et al. 2021)
Clematis argentilucida roots	3β-*O*-[β-D-Rib-(1→3)-α-L-Rha-(1→2)-α-L-Ara] hederagenin-11,13-dien-28-oic acid 3β-*O*-{β-D-Rib-(1→3)-α-L-Rha-(1→2)-[β-D-Glc-(1→4)]-β-D-Xyl} oleanolic acid nimustine	HL-60 HepG2 HL-60 HepG2 HL-60	IC_{50} [μM] 72 h 6.61±1.40 5.30±1.90 3.82±0.28 2.74±0.34 0.35±0.03	MTT assay	(Hai et al. 2012)

	(positive control)	HepG2	0.52±0.05		
Clematis mandshurica roots and rhizomes	mandshunoside A mandshunoside B paclitaxel (positive control)	HCT 116 HT-29 HCT 116 HT-29 HCT 116 HT-29	IC_{50} [μM] [dng] 2.1 3.7 2.5 3.3 3.5 nM 3.4 nM	MTT assay	(He et al. 2011)
Clematis mandshurica roots and rhizomes	clematomandshurica saponin J clematomandshurica saponin K oleanolic acid 3-*O*-β-D-glucopyranosyl-(1→3)-α-L-Rha-(1→2)[β-D-Glc-(1→4)]-α-L-Ara podophyllotoxin (positive control) DMSO (negative control)	PC-3 PC-3 PC-3 PC-3	GI_{50} [μM] 72 h 1.29±0.29 1.50±0.49 0.71±0.38 0.62±0.29	MTT assay	(Gong et al. 2013)
Clematis mandshurica roots and rhizomes	mandshunoside C mandshunoside D mandshunoside E clematochinenoside A paclitaxel (positive control)	HCT 16 HT-29 HCT 116 HT-29 HCT 116 HT-29 HCT 116 HT-29 HCT 116 HT-29	IC_{50} [μM] 72 h 3.0 2.8 0.6 0.9 2.7 4.2 8.4 7.3 0.0035 0.0034	MTT assay	(Li et al. 2013a)

Clematis tangutica whole plant	 clematoside S sapindoside B kalopanax saponin A koelreuteria saponin A adriamycin (positive control)	 SGC-7901 HepG2 HL-60 HepG2 HL-60 SGC-7901 HepG2 HL-60 SGC-7901 HepG2 HL-60 SGC-7901 HepG2 HL-60	IC_{50} [μM] 72 h 8.18±0.53 1.88±0.41 5.21±0.52 4.24±0.58 6.58±0.42 9.08±0.29 7.26±0.78 8.72±0.91 9.01±0.21 6.01±0.52 5.34±0.38 0.33±0.05 0.18±0.02 0.36±0.05	MTT assay	(Zhao et al. 2016)
Clinopodium chinense aerial parts	 clinopoursaponin A 10-hydroxy-camptothecin (positive control)	 4T1 4T1	IC_{50} [μM] 48 h 7.4 7.6	MTT assay	(Zhu et al. 2018)
Combretum oliviforme leaves	 23-*O*-α-L-Rha 1,3β-diacetylimberbic acid	 SGC-7901 K562	IC_{50} [μM] 24 h 5.44±0.82 2.38±0.07	MTT assay	(Wu et al. 2010)
Curculigo orchioides rhizomes	 3β-[(β-D-Glc)oxy]-12α,16β-dihydroxy-9,19-cyclolanostan-24-one etoposide (positive control)	 HL-60 HL-60	IC_{50} [μM] 72 h 9.0 0.39	MTT assay	(Yokosuka et al. 2010)

Cybianthus magnus roots			IC_{50} [µM] 48 h	SRB assay	(Haddad et al. 2013)
	magnoside A	DU145	6		
		MCF-7	5		
		HT-29	4		
			IC_{50} [µM] 72 h	MTT assay	
		Hs683	7		
		U-251 MG	10		
		HT-29	4		
		SK-MEL-28	7		
		B16F10	4		
			IC_{50} [µM] 48 h	SRB assay	
	magnoside B	HT-29	7		
			IC_{50} [µM] 72 h	MTT assay	
		Hs683	10		
		B16F10	7		
Cyclamen persicum *Cyclamen libanoticum* tubers			IC_{50} [µM] 24 h	WST-1	(Hosry et al. 2014)
	saxifragifolin B	SK-BR-3	0.36		
		HT-29	0.25		
		HepG2/3A	0.29		
		NCI-H1299	0.55		
		BXPC-3	0.28		
		22RV1	0.18		
		DMEM	0.28		
	cyclamin	SK-BR-3	0.84		
		HT-29	0.33		
		HepG2/3A	0.51		
		NCI-H1299	0.64		
		BXPC-3	0.73		
		22RV1	0.34		
		DMEM	0.32		
	mitomycin C (positive control)	SK-BR-3	20.20		
		HT-29	0.45		

		HepG2/3A NCI-H1299 BXPC-3 22RV1 DMEM	2.93 21.73 1.74 2.66 >100		
Cyclamen trocopteranthum tubers	3β-*O*-4-*O*-[3-hydroxyl-3-methylglutaryl]-β-D-Xyl-(1→2)-β-D-Glc-(1→4)-[β-D-Glc-(1→2)]-α-L-Ara-16α-hydroxy-13β,28-epoxy-oleanan-30-al deglucocyclamin I cyclamin paclitaxel (positive control)	HTC 116 HT-29 HTC 116 HT-29 HTC 116 HT-29 HTC 116 HT-29	IC_{50} [µM] 72 h 1.47±0.50 2.54±0.29 1.47±0.09 1.21±0.30 9.98±0.41 8.67±0.54 2.10-3±1.33 2.18-3±0.81	MTT assay	(Mihci-Gaidi et al. 2010)
Cyclocarya paliurus leaves	cypaliuruside F cypaliuruside G cypaliuruside K cypaliuruside M DDP (positive control) paclitaxel	HepG2 NCI-H460 T-47D HepG2 LoVo HepG2 NCI-H460 T-47D LoVo HepG2 NCI-H460 T-47D LoVo	IC_{50} [µM] 48 h 4.61±0.13 5.47±0.54 8.65±1.38 9.08±0.52 8.96±0.07 9.19±0.24 6.48±1.18 5.87±1.59 12.35±1.06 4.88±0.59 29.77±3.01 36.77±7.77 2.72±0.46	MTT assay	(Zhou et al. 2021)

	(positive control)	HepG2 NCI-H460 T-47D	0.24±0.04 0.98±0.33 0.58±0.10		
Cylindrokelupha dalatensis seeds	cylindroside B cylindroside D	HL-60 HL-60	IC_{50} [µM] 48 h 7.15±0.63 4.74±0.57	MTT assay	(Yan et al. 2018)
Dendrobangia boliviana roots	zebirioside C zebirioside I α-hederin (positive control)	human dermal fibroblasts human dermal fibroblasts human dermal fibroblasts	IC_{50} [µM] 24 h 6.4 5.6 4.6	MTT assay	(Zebiri et al. 2016)
Fagonia schimperi whole plant	3-*O*-β-Xyl-(1→2)-α-L-Ara-27-hydroxyoleanolic acid 28-*O*-β-Glc	MCF-7	IC_{50} [µg/mL] ^{dng} 8.18±0.9	SRB assay	(Ismail et al. 2020)
Gardenia jasminoides roots	3-*O*-β-D-Glc-6′-*O*-methyl ester oleanolic acid 3-*O*-β-D-Glc oleanolic acid chikusetsusaponin IVa butyl ester 5-FU (positive control)	MCF-7 A549 HeLa HeLa MCF-7 A549 A354-S2 HeLa MCF-7 A549 A354-S2	IC_{50} [µg mL^{-1}] 48 h 8.6 6.2 3.4 1.4 5.2 3.1 4.3 28.1 41.0 13.6 1.5	MTT assay	(Wang et al. 2012a)
Gladiolus segetum corms	3-*O*-[β-D-Glc-(1→2)-β-D-Glc-(1→4)-β-D-Xyl] 2β,3β,16α trihydroxyolean-12-en-23,28-	PC-3 HepG2 A549 MCF-7	IC_{50} [µg/mL] 48 h 3.45±0.26 5.98±0.21 2.41±0.34 6.43±0.23	MTT assay	(Abd El-kader et al. 2020)

	dioic acid 28-*O*-α-L-Rha-(1→4)-α-L-Rha-(1→2)-β- D-Glc-(1→2)-α-L-Ara doxorubicin (positive control)	 PC-3 HepG2 A549 MCF-7	 1.63±0.22 2.65±0.32 1.37±0.21 2.26±0.28		
Gleditsia aquatica fruits	 aquaticasaponin A aquaticasaponin B doxorubicin (positive control)	 MCF-7 HCT 116 MCF-7 HCT 116 MCF-7 HCT 116	IC_{50} [µM] [dng] 0.80±0.3 0.5±0.21 1.0±0.3 0.76±0.4 0.81±0.06 0.86±0.1	MTT assay	(Ragab 2015)
Gleditsia caspica fruits	 caspicaoside A caspicaoside B caspicaoside C caspicaoside D adriamycin (positive control)	 HepG2 HepG2 A549 HT-29 HepG2 A549 HT-29 HepG2 HepG2 A549 HT-29	IC_{50} [µM] [dng] 4.5 2.5 6.5 3.9 2.2 3.7 1.5 5.4 6.9 7.9 6.4	MTT assay	(Miyase et al. 2010)
Gleditsia caspica fruits	 caspicaoside G caspicaoside H	 HepG2 MCF-7 HCT 116	IC_{50} [µM] [dng] 9.4±0.81 2.1±0.16 8.8±1.17	acid phosphatase assay	(Melek et al. 2014)

		MCF-7	2.1±0.24		
	caspicaoside I	MCF-7	2.1±0.19		
	caspicaoside J	HCT 116 HepG2 MCF-7	5.5±0.32 5.7±0.41 1.6±0.75		
	caspicaoside K	HCT 116 HepG2 MCF-7	6.1±0.56 6.8±0.31 1.8±0.09		
	adriamycin (positive control)	HCT 116 HepG2 MCF-7	0.1±0.03 6.9±0.95 2.5±0.28		
Gleditsia sinensis anomalous fruits	3-*O*-β-D-Xyl-(1→2)-α-L-Ara-(1→6)-β-D-Glc oleanolic acid 28-*O*-β-D-Xyl-(1→4)-α-L-Rha-(1→4)-β-D-Xyl-(1→4)-α-L-Rha-(1→3)-β-D-Glc ester	HepG2	IC_{50} [μM] 48 h 9.5±1.1	MTT assay	(Liu et al. 2016)
	matrine (positive control)	HepG2	23.6±2.4		
Glochidion eriocarpum whole plant	glochierioside A	HL-60 HCT 116	IC_{50} [μM] 72 h 5.50±0.12 1.16±0.08	MTT assay	(Nhiem et al. 2012)
	glochierioside B	HL-60 HCT 116	4.51±0.07 0.41±0.01		
	glochierioside C	HL-60 HCT 116	5.07±0.05 0.94±0.07		
	glochierioside D	HL-60 HCT 116	6.33±0.16 0.73±0.04		
	mitoxantrone	HL-60	8.40±0.21		

	(positive control)	HCT 116	7.23±0.35		
Glochidion glomerulatum leaves			IC_{50} [μM] 72 h	MTT assay	(Thu et al. 2015)
	glomeruloside A	HT-29 OVCAR	5 7.3±1.4 6.6±0.7		
	glomeruloside B	A549 HT-29	9.7±1.2 7.5±1.7		
	glomeruloside C	A549 HT-29 OVCAR	7.9±0.8 5.9±0.5 9.8±2.1		
	glomeruloside E	A549 HT-29 OVCAR	8.2±1.0 5.9±0.7 8.6±3.1		
	mitoxanthrone (positive control)	A549 HT-29 OVCAR MCF-7	7.2±0.5 3.1±0.3 8.4±0.9 10.3±1.2		
Glochidion hirsutum leaves			IC_{50} [μM] 48 h	SRB assay	(Thang et al. 2017)
	hirsutosideA	HepG2 A549 MCF-7 SW626	8.2±1.3 9.3±0.3 9.2±0.5 8.5±1.3		
	hirsutoside B	HepG2 A549 MCF-7 SW626	3.4±0.3 4.4±0.7 4.7±0.6 6.6±1.0		
	hirsutoside D	HepG2 A549 MCF-7 SW626	7.6±0.8 8.0±2.2 8.8±1.3 9.1±1.1		
	hirsutoside E	HepG2 A549	9.9±3.1 8.6±1.3		
	ellipticine	HepG2	1.4±0.2		

	(positive control)	A549 MCF-7 SW626	1.8±0.3 2.0±0.3 2.1±0.3		
Gordonia longicarpa stems	 longicarposide E longicarposide F longicarposide G longicarposide H longicarposide I gordonoside I gordonoside J	 HCT-8 BEL-7402 GC-823 A549 A2780 HCT-8 BEL-7402 BGC-823 A2780 HCT-8 BEL-7402 BGC-823 A549 A2780 HCT-8 BEL-7402 BGC-823 A549 A2780 HCT-8 BEL-7402 A2780 HCT-8 BEL-7402 BGC-823 A549 A2780 HCT-8 BEL-7402 BGC-823	IC_{50} [μM] 96 h 2.29 1.73 2.59 3.04 1.93 2.48 2.17 2.57 1.99 3.92 2.08 2.20 8.42 2.04 2.46 2.10 1.95 4.58 2.09 2.95 3.88 4.19 1.92 1.42 2.54 2.20 1.81 2.70 1.99 1.95	MTT assay	(Tang et al. 2013)

		A549 A2780	4.58 1.98		
	floratheasaponin B	HCT-8 BEL-7402 BGC-823 A2780	7.73 6.94 3.43 2.93		
	paclitaxel (positive control)	HCT-8 BEL-7402 BGC-823 A549 A2780	0.05 0.006 0.00329 0.0449 0.00786		
Hemsleya amabilis rhizomes	xuedanoside K	HeLa HCT-8	IC_{50} [μM] 48 h 2.01 8.94	MTT assay	(Wang et al. 2020)
	doxorubicin (positive control)	HeLa HCT-8	1.21 0.94		
Hemsleya amabilis tubers	3β,11α-dihydroxycucurbita-5,24(E)-diene-3,26-Glcs	HeLa	IC_{50} [μM] 96 h 9.8	MTT assay	(Jiang et al. 2018)
	doxorubicin (positive control)	HeLa	0.96		
Hemsleya penxianensis rhizomes	xuedanoside H	HeLa A549	IC_{50} [μM] 48 h 7.55±1.75 48 h 8.55±1.78	MTT assay	(Chen et al. 2019)
	xuedanoside J	HeLa MCF-7 A549	24 h 4.88±1.05 48 h 2.25±0.42 48 h 4.72±0.54 48 h 5.33±0.68		
	doxorubicin (positive control)	HeLa MCF-7 A549	24 h 2.15±0.06 48 h 1.32±0.03 24 h 3.02±0.04 48 h 2.45±0.05 24 h 6.10±0.26 48 h 3.85±0.05		

Hylomecon japonica whole herb	hylomeconoside K 3-*O*-β-D-Gal-(1→2)-[α-L-Ara-(1→3)]-β-D- GlcA gypsogenin 28-*O*-β-D-Glc-(1→3)-[β-D-Xyl-(1→4)]-α-L-Rha-(1 →2)-β-D-Fuc ester topotecan (positive control)	AGS AGS AGS	IC_{50} [μM] 72 h 6.01±0.014 3.66±0.018 71.90±0.012	MTT assay	(Li et al. 2021a)
Hylomecon japonica whole herb	hylomeconoside H paclitaxel (positive control)	K562 K562	IC_{50} [μM] 72 h 6.60 0.001477	MTT assay	(Li et al. 2021b)
Ilex asprella roots	ilexasprellanoside B ilexasprellanoside D 3-*O*-β-D-Glc oleanolic acid 5-FU (positive control)	A549 A549 A549 A549	IC_{50} [μM] 72 h 1.87±0.13 2.51±0.29 1.41±0.16 28.96±1.13	MTT assay	(Lei et al. 2014)
Ilex cornuta roots	3β-*O*-α-L-Ara-(1→2)-β-D-Glc-6-*O*-butyl ester oleanolic acid norcantharidin	HeLa SMMC-7721 HL-60 HeLa SMMC-7721 HL-60	IC_{50} [μM] 24 h 8.65±1.07 9.35±1.38 8.06±1.15 4.16±0.37 5.23±0.42 3.45±0.26	MTT assay	(Liao et al. 2013)
Ilex pubescens roots	ilexsaponin H 21-*O*-β-D-Glc 3β,21α,23-	HCT 116 HT-29 HCT 116	IC_{50} [μM] ^{dng} 3.2±0.3 3.7±0.4 2.7±0.5	MTT assay	(Li et al. 2014)

	trihydroxy-urs-12-en-28-oic acid 3-*O*-β-D-Glc 21-*O*-β-D-Glc 3β,21 α,23-trihydroxy-urs-12-en-28-oic acid ilexsaponin E ilexoside XXX paclitaxel (positive control)	HT-29 HCT 116 HT-29 HCT 116 HT-29 HCT 116 HT-29 HCT 116 HT-29	2.2±0.4 5.2±1.2 4.9±0.7 6.6±1.5 7.2±0.8 8.3±1.9 7.1±1.0 0.0038±0.0003 0.0040±0.0004		
Jacquinia flammea roots	sakurasosaponin podophyllotoxin (positive control)	RAW 264.7 RAW 264.7	IC_{50} [μM] 24 h 3.8±0.25 68±0.9	MTT assay	(Sánchez-Medina et al. 2010)
Jacquinia macrocarpa Cav. *spp. pungens* fruit shells	primulasaponin doxorubicin (positive control)	LS180 LS180	IC_{50} [μM] 48 h 9.3±0.8 4.7±0.3	MTT assay	(Vidal Gutiérrez et al. 2020)
Kalopanax pictus stem bark	3-*O*-α-L-Ara 3β,6β,23-trihydroxyolean-12-en-28-oic acid 3-*O*-α-L-Ara hederagenin kalopanaxsaponin A sapindoside B	HL-60 HL-60 HCT 116 MCF-7 HL-60 HCT 116 HL-60	IC_{50} [μM] ^{dng} 0.3±0.08 5.8±0.1 0.5±0.03 7.4±0.8 5.6±0.1 0.4±0.06 0.1±0.03 0.8±0.07	MTT assay	(Quang et al. 2012)

	cauloside D cussonoside B mitoxantrone (positive control)	HCT 116 HL-60 HL-60 HL-60 HCT 116 MCF-7	6.9±0.3 5.1±0.7 0.1±0.01 3.7±0.6 7.1±0.5		
Larrea tridentata aerial parts	patriniaglycoside B-II 3-[(α-L-Ara)oxy] -30-noroleana-12,20(29)-dien-28-oic acid β-D-Glc ester guaianin A2 etoposide (positive control) cisplatin (positive control)	HL-60 HL-60 HL-60 HL-60 HL-60	IC_{50} [μM] 72 h 6.9±0.11 6.0±1.47 4.1±0.37 0.33±0.01 1.1±0.03	MTT assay	(Jitsuno and Mimaki 2010)
Lecaniodiscus cupanioides stem	3-*O*-[α-L-Ara*f*- (1→3)-α-L-Rha-(1→2)-α-L-Ara] hederagenin 3-*O*-[α-L-Ara*p*-(1→3)-α-L-Rha-(1→2)-α-L-Ara] hederagenin	A549 HT-29 H-116 A549 HT-29 H-116	IC_{50} [μg/mL] 48 h 2.5 2.5 5.0 5.0 5.0 2.5	MTT assay	(Adesegun et al. 2014)
Ligularia przewalskii whole plant	(20S*,24R*)-epoxy-9β,19-cyclolanostane-3β,16β,25,28-tetrol-3-*O*-β-D-Glc 3-*O*-[(6-*O*-*n*-butyl)-β-D-Glc]-12-en-olean-3β,16β,28-triol	HepG2 HeLa SGC-7901	IC_{50} [μM] 24 h 8.59±0.3 8.40±0.4 9.71±0.4	MTT assay	(Shi et al. 2019)

	 cisplatin (positive control) 5-FU (positive control)	MDA-231 HepG2 HeLa SGC-7901 MDA-231 HepG2 HeLa SGC-7901 MDA-231	9.28±1.9 6.54±0.1 9.70±0.3 9.26±0.7 9.43±1.0 30.83±1.6 54.45±5.0 not detected not detected		
Lonicera similis buds	 hederagenin 3-*O*-β-D-Glc-(1→4)-β-D-Glc-(1→3)-α-L-Rha-(1→2)-α-L-Ara taxol (positive control)	 HepG2 HepG2	IC_{50} [μM] 72 h 8.98±0.19 dng	MTT assay	(Zhang et al. 2018c)
Lysimachia ciliata,*L. ephemerum* underground and aerial parts *L. nummularia,* *L. punctata* underground parts *L. clethroides* underground parts	 desglucoanagalloside B anagallosaponin IV ardisicrispin A 3-*O*-β-D-Glc-(1→2)-[α-L-Rha-(1→2) β-D-Glc-(1→4)]-α-L-Ara-protoprimulagenin A	 BLM DU145 PC-3 Pnt2 BLM DU145 A375 HTB140 BLM A375 DU145	IC_{50} [μg/mL] 24 h 7.3 48 h 9.5 24 h 9.6 48 h 8.5 48 h 9 48 h 6 24 h 8.6 48 h 7.8 24 h 10 48 h 5 24 h 8 48 h 6 24 h 10 48 h 5 24 h 4 48 h 2 24 h 7	trypan blue exclusion dye test	(Podolak et al. 2013a)

			48 h 5		
		PC-3	24 h 5		
			48 h 3		
	mitoxantrone (positive control)	DU145	24 h >5		
			48 h >5		
		PC-3	24 h 2		
			48 h 1.87		
		Pnt2	24 h 0.45		
			48 h 0.2		
Lysimachia clethroides aerial parts			IC_{50} [μM] 72 h	MTT assay	(Liang et al. 2011)
	clethroidoside C	HT-29	1.99		
		HepG2	1.48		
		BGC-823	1.93		
		A549	2.62		
		A375	1.14		
	clethroidoside D	HT-29	1.98		
		HepG2	1.73		
		BGC-823	1.36		
		A549	2.36		
		A375	1.91		
	clethroidoside E	HT-29	1.40		
		HepG2	6.26		
		BGC-823	8.05		
	clethroidoside F	HT-29	2.04		
		HepG2	1.26		
		BGC-823	1.95		
		A549	2.28		
		A375	2.19		
	ardisianoside E	HT-29	1.81		
		HepG2	0.75		
		BGC-823	1.14		
		A549	2.47		
		A375	1.71		
	3-*O*-β-D-Glc-(1→2)-[α-LRha-	HT-29	1.96		

	(1→2)-β-D-Glc-(1→4)]-α-L-Ara 13β,28-epoxy-3β,16α-dihydroxyoleanane lysikokianoside 1 paclitaxel (positive control)	HepG2 BGC-823 A549 A375 HT-29 HepG2 BGC-823 A549 A375 HT-29 HepG2 BGC-823 A549 A375	0.99 2.07 1.95 2.13 1.96 1.00 1.75 1.91 1.94 0.00394 0.0044 0.00329 0.0449 0.0049		
Lysimachia fortunei aerial parts	 3β-{α-L-r-Rha-(1→2)-β-D-Glc-(1→4)-[β-D-Glc-(1→2)]-α-L-Ara}-13β,28-epoxy-16α-hydroxyoleanane lysikokianoside 1 sorafenib (positive control)	 Hep3B SMMC-7721 HuH7 SK-Hep-1 SMMC-7721 Hep3B HuH7 SK-Hep-1	IC_{50} [μM] 48 h 9.31±0.30 6.77±0.41 7.85±0.09 4.76±0.03 18.16±0.03 11.95±0.37 14.68±0.45 19.11±0.19	MTT assay	(Zhang et al. 2018b)
Lysimachia nummularia underground parts	 nummularoside mitoxantrone (positive control)	 PC-3 DU145 U373 PC-3 DU145 U373	EC_{50} [μg/mL] 24 h 7.4±1.1 1.2±0.3 6.0±1.3 2.0±0.3 <5 <5	trypan blue exclusion dye test	(Podolak et al. 2013b)

Machilus yaoshansis roots	2-*O*-β-D-Glc cucurbitacin E camptothecin (positive control)	BGC-823 A549 BGC-823 A549	IC_{50} [μM] 96 h 4.98 3.20 0.26−11.8	MTT assay	(Gan et al. 2011)
Machilus yaoshansis stem bark	machiluside A machiluside B camptothecin (positive control)	A2780 HCT-8 BEL-7402 BGC-823 A549	IC_{50} [μM] 96 h 0.40-6.52 0.28-12.5	MTT assay	(Liu et al. 2011)
Momordica cochinchinensis vines	chikusetsusaponin IVa ethyl ester mitomycin c (positive control)	WiDr WiDr	IC_{50} [μM] 48 h 8.42±0.66 0.19±0.01 [μg/mL]	MTT assay	(Huang et al. 2021)
Nematostylis anthophylla roots	randianin 2''-*O*-acetylrandianin 6''-*O*-acetylrandianin paclitaxel (positive control) vinblastine (positive control)	A2780 A2058 H522 A2780 A2058 A2780 A2058 A2780 A2058 H522 A2780 A2058 H522	IC_{50} [μM] 48 h 2.2±0.2 7.63 7.32 1.7±0.1 >3.3, <10 1.2±0.3 >3.3, <10 0.028±0.003 not detected not detected not detected 0.004 0.009	alamarBlue assay	(Dai et al. 2013)
Orychophragmus			IC_{50} [μM] 48 h	MTT assay	(Zhang et al. 2019)

violaceus seeds	orychoside A mimengoside C mimengoside D buddlejasaponin I buddlejasaponin III cisplatin (positive control)	HepG2 A549 HepG2 A549 HepG2 HepG2 A549 HepG2 A549 HepG2 A549	7.13±0.10 8.77±0.31 7.82±0.17 6.78±0.21 9.62±0.68 0.78±0.21 0.48±0.04 1.06±0.09 0.96±0.12 9.33±0.37 8.25±0.14		
Panax ginseng steamed leaves	 ginsenoside SL3 (20*S*)-ginsenoside Rg2 ginsenoside F4 ginsenoside Rh3 ginsenoside Rk2 (20*S*)-ginsenoside Rh2 mitoxantrone (positive control)	 HL-60 HL-60 HL-60 HL-60 HL-60 HL-60 HL-60	IC_{50} [μM] 24 h 9.0±0.4 9.0±0.5 7.5±1.5 0.8±0.1 0.9±0.1 8.2±0.1 7.9±0.5	MTT assay	(Tung et al. 2010)
Panax japonicus rhizome	 chikusetsusaponin IVa methyl ester	 A2780 HEY	IC_{50} [μM] 48 h 7.43±1.55 7.94±1.72	MTT assay	(Chen et al. 2016)
Panax japonicus var. *major*	 28-desglucosyl-chikusetsusaponin IVa	 BGC-823	IC_{50} [μM/L] 48 h 9.94	MTT assay	(Wang et al. 2020b)
Panax notoginseng roots and rhizomes	 notoginsenoside Ab2	 HepG2 NCI-H460	IC_{50} [μg/mL] 72 h 4.49 8.06	MTT assay	(Li et al. 2020b)

	  cisplatin (positive control)	MCF-7 HepG2 NCI-H460 MCF-7	7.38 0.97 1.34 2.66		
Panax notoginseng roots	 6-*O*-β-D-Glc-20-*O*-β-D-Glc-20(*S*)-protopanaxadiol-3-one	 HCT-8 BEL-7402 BGC-823 A549 A2780	IC_{50} [µg/mL] 72 h 5.4 6.3 8.6 7.7 8.1	MTT assay	(Fu et al. 2013)
Panax stipuleanatus rhizomes	 spinasaponin A methyl ester pesudoginsenoside RP1 methyl ester mitoxantrone (positive control)	 HL-60 HCT 116 HCT 116 HL-60 HCT 116	IC_{50} [µM] [dng] 4.44 0.63 6.50 7.5 3.96	MTT assay	(Liang et al. 2010)
Patrinia scabra roots	 Acanthopanax saponin CP3 gambogic acid (positive control)	 HepG2 HepG2	IC_{50} [µM/L] [dng] 1.49 3.53	MTT assay	(Feng et al. 2014)
Phragmanthera capitata	 3-*O*-β-D-Glc 28-hydroxy-α-amyrin doxorubicin (positive control)	 HeLa HeLa	IC_{50} [µM] 48 h 6.88±2.41 1.92±0.42	MTT assay	(Njoya et al. 2020)
Pittosporum angustifolium leaves	 pittangretoside A pittangretoside B pittangretoside C 22α-angeloyloxy-3β-[β-D-Glc-	 5637 5637 5637 5637	IC_{50} [µM] 72 h 4.1 5.2 2.1 2.4	neutral red uptake assay	(Bäcker et al. 2013)

	(1→2)]-[α-L-Ara-(1→3)]-β-D-Glc-oxyolean-12-ene-15α,16α,28-triol				
Pittosporum angustifolium seeds	 pittangretoside O pittangretoside P 21β-angeloyloxy-22α-acetoxy-3β-[β-D-Glc-(1→2)]-[α-L-Ara-(1→3)]-[α-L-Ara-(1→4)]-β-D-GlcA-oxyolean-12-ene-15α,16α,28-triol 22α-(2-methylbutyroyloxy)-3β-[β-D-Glc-(1→2)]-[α-L-Ara-(1→3)]-[α-L-Ara-(1→4)]-β-D-GlcA-oxy-olean-12-ene-5α,16α,28-triol [α-L-Ara-(1→3)]-[α-L-Ara-(1→4)]-β-D-GlcA-oxy-olean-12-ene-15α,16α,28-triol 21β-angeloyloxy-22α-angeloyloxy-3β-[β-D-Glc-(1→2)]-[α-L-Ara-(1→3)]-[α-L-Ara-(1→4)]-β-D-GlcA-oxyolean-12-ene-15α,16α,28-triol etoposide (positive control)	 5637 LN18 5637 LN18 HaCaT 5637 LN18 5637 LN18 5637 LN18 MCF-7 HaCaT 5637 LN18 MCF-7 HaCaT	IC_{50} [μM] 72 h 6.9±1.0 4.4±0.7 4.5±1.0 4.9±0.8 9.0±0.5 6.2±1.3 3.9±0.1 4.1±1.0 6.4±0.5 1.7±0.1 4.6±0.5 8.9±0.8 2.2±0.5 0.6±0.1 0.6±0.1 1.0±0.2 1.5±0.2	neutral red uptake assay	(Bäcker et al. 2014)
Platycodon			IC_{50} [μM] 48 h	SRB assay	(Choi et al. 2010)

grandiflorum roots	platycodin D 2″*O*-acetylplatycodin D 3″*O*-acetylplatycodin D platycodin D2 polygalacin D 2″-*O*-acetylpolygalcin D 3″-*O*-acetylpolygalacin D polygalacin D2 2″-*O*-acetylpolygalacin D2	MES-SA HCT-15 HCT15/CL02 MES-SA MES-SA/DX5 HCT-15 HCT15/CL02 MES-SA MES-SA/DX5 HCT-15 HCT15/CL02 MES-SA MES-SA/DX5 HCT-15 HCT15/CL02 MES-SA MES-SA/DX5 HCT-15 MES-SA MES-SA/DX5 HCT-15 MES-SA MES-SA/DX5 MES-SA MES-SA/DX5 HCT-15 HCT15/CL02 MES-SA MES-SA/DX5 HCT-15 HCT15/CL02	3.9±0.45 5.7±0.64 7.9±0.77 2.3±0.63 2.2±0.82 3.4±0.76 4.2±0.64 2.3±0.83 2.2±0.94 3.4±0.52 4.1±0.53 3.5±0.43 5.2±0.32 9.6±0.35 5.7±0.63 5.0±0.74 7.7±0.63 8.5±0.45 3.6±0.55 4.2±0.76 6.7±0.54 6.3±0.36 6.2±0.37 2.6±0.73 3.4±0.85 3.8±0.56 5.8±0.44 3.4±0.46 3.4±0.93 3.6±0.86 5.9±0.35		

	3″-*O*-acetylpolygalacin D2 etoposide (positive control)	MES-SA MES-SA/DX5 HCT-15 HCT15/CL02 MES-SA MES-SA/DX5 HCT-15 HCT15/CL02	3.3±0.54 3.4±0.64 3.6±0.36 5.8±0.46 0.3±0.63 >10.0 1.6±0.54 >10.0		
Platycodon grandiflorum roots	 platycodonoid A platycodin D deapioplatycodin D polygalacin D colchicine (positive control)	 HSC-T6 HSC-T6 HSC-T6 HSC-T6 HSC-T6	IC_{50} [μM] 48 h 5.27 1.77 8.24 1.04 < 10	MTT assay	(Zhan et al. 2012)
Platycodon grandiflorum roots	 2″-*O*-acetylplatycodin D 3″-*O*-acetylplatycodin D 2″-*O*-acetylpolygalacin D 3″-*O*-acetylpolygalacin D doxorubicin (positive control)	 A549 A549 A549 A549 A549	IC_{50} [μM] 24 h 8.1±0.6 7.2±1.8 10.0±0.2 7.3±0.4 4.7±1.1	CCK-8 assay	(Chun et al. 2013)
Platycodon grandiflorum roots	 platycodon A platycodon B doxorubicin (positive control)	 HepG2 A549 HepG2 A549 HepG2 A549	IC_{50} [μM] 48 h 4.9±0.5 6.9±0.8 7.5±1.2 9.4±0.3 0.18±0.01 1.5±0.02	MTT assay	(Ma et al. 2013)

Polycarpaea arenaria aerial parts	arenaroside C arenaroside D arenaroside F arenaroside G paclitaxel (positive control)	A549 RT-112 A549 HCT 116 PC-3 RT-112 HCT 116 RT-112 A549 HCT 116 PC-3 A549 HCT 116 PC-3 RT-112	IC$_{50}$ [µM] 48 h 8.7±0.05 7.3±0.04 6.1±1.72 7.7±0.21 9.4±0.18 6.4±0.13 9.8±0.23 7.8±0.21 9.0±0.10 6.8±0.69 9.9±0.55 0.70±0.21 0.03±0.001 0.04±0.002 0.07±0.005	MTT assay	(Nguyen et al. 2021)
Polycarpaea corymbosa var. *eriantha* roots and leaves	3β-*O*-(β-D-Xyl-(1→2)-β-D-Glc-(1→4)-[β-D-Glc(1→2)]-α-L-Ara)-13β,28-epoxyolean-11-en-16α-ol etoposide (positive control)	SW480 SW480	IC$_{50}$ [µM] 24 h 4.61±2.24 13.22±3.79	XTT assay	(Manase et al. 2014)
Pulsatilla chinensis	Pulsatilla saponin D	SMMC-7721 MCF-7 A549	IC$_{50}$ [µM] 48 h 4.5± 0.9 3.7±0.2 7.9±1.1	MTT assay	(Fang et al. 2019)
Pulsatilla chinensis	pulchinenoside B3 pulchinenoside BD pulchinenoside B7 pulchinenoside B10	LS 180 LS 180 LS 180 LS 180	IC$_{50}$ [µM] 24 h 4.13±0.45 7.05±0.52 5.77±0.36 7.49±0.46	alamarBlue assay	(Liu et al. 2020)

	pulchinenoside B11	LS 180	8.78±0.68		
Pulsatilla koreana roots	3-*O*-β-D-Glc-(1→4)-*O*-α-L-Rha-(1→2)-[*O*-β-D-Glc-(1→4)]-*O*-α-L-Ara oleanolic acid 3-*O*-β-D-Glc-(1→4)-*O*-α-L-Rha-(1→2)-*O*-α-L-Ara oleanolic acid raddeanoside R13 3-*O*-β-D-Glc-(1→4)-β-D-Glc-(1→3)-α-L-Rha-(1→2) [β-D-Glc-(1→4)]-α-L-Ara oleanolic acid 3-*O*-β-D-Glc-(1→4)-β-D-Glc-(1→3)-α-L-Rha-(1→2)-α-L-Ara oleanolic acid scabioside C hederoside C Pulsatilla saponin D 3-*O*-β-D-Glc-(1→4)-*O*-α-L-Rha-(1→2)-*O*-α-L-Ara hederagenin scabioside A mitoxantrone (positive control)	HL-60 HL-60 HL-60 HL-60 HL-60 HL-60 HL-60 HL-60 HL-60 HL-60 HL-60	IC_{50} [µM] 72 h 0.40±0.02 0.39±0.01 0.32±0.04 0.64±0.03 0.63±0.01 2.86±1.13 0.75±0.75 4.23±0.40 3.91±0.20 3.77±0.11 6.80±0.90	MTT assay	(Li et al. 2013b)
Quillaja saponaria bark	QS-21	SNU-1	IC_{50} [µM] 24 h 7.1±0.4	MTS assay	(Guzmán et al. 2020)

		KATO III	7.4±1.4		
Rubia yunnanensis roots	rubiarboside G 28-acetate paclitaxel (positive control)	HeLa HeLa	IC_{50} [μM] 48 h 2.2 0.6	SRB assay	(Fan et al. 2011)
Salicornia bigelovii herb	bigelovii A cisplatin (positive control)	HL-60 HL-60	IC_{50} [μM] 24 h 6.18 7.33	MTT assay	(Wang et al. 2012b)
Salicornia bigelovii herb	3-*O*-β-D-Glc-6-*O*-butyl ester-28-*O*-β-D-Glc oleanolic acid cisplatin (positive control)	MCF-7 MCF-7	IC_{50} [μM] 72 h 3.52±1.19 14.73±5.30	MTT assay	(Guan et al. 2015)
Sanguisorba officinalis roots	ziyu-glucoside I cisplatin (positive control)	SMMC-7721 DU145 SMMC-7721 DU145	IC_{50} [μM] [dng] 9.27±1.26 8.49±0.60 2.90±0.70 39.86±10.23	not mentioned	(Zhang et al. 2012a)
Sanguisorba officinalis roots	3β-[(α-L-Ara)-oxy]-19α,23-dihydroxyolean-12-en-28-oic acid 28-[6-*O*-acetyl-β-D-Glc] ester 2α,3β,19α,23-tetrahydroxyurs-12-en-28-oic acid 28-[6-*O*-acetyl-β-D-Glc] ester 3β-[(α-L-Ara)-oxy]-19α -	MCF-7 HeLa HepG2 SGC-7901 NCI-H460 BGC-823 MCF-7 HeLa HepG2 SGC-7901 NCI-H460 BGC-823 MCF-7	IC_{50} [μM] 48 h 2.6 2.4 2.7 3.1 2.7 3.3 4.3 4.1 4.6 4.5 4.8 4.7 3.2	MTT assay	(Hu et al. 2015)

	hydroxyurs-12,20(30)-dien-28-oic acid 28-[6-*O*-acetyl-β-D-Glc] ester	HeLa HepG2 SGC-7901 NCI-H460 BGC-823	3.6 2.9 3.7 3.0 3.7		
	doxorubicin (positive control)	MCF-7 HeLa HepG2 SGC-7901 NCI-H460 BGC-823	0.02 0.05 0.04 0.01 0.01 0.02		
Saponaria officinalis roots			IC_{50} [μM] 48 h	alamarBlue assay	(Lu et al. 2015)
	3-*O*-β-D-Gal-(1→2)-[β-D-Xyl-(1→3)]-β-D-GlcA-quillaic acid-28-*O*-β-D-Glc-(1→3)-[β-D-Xyl-(1→4)]-α-L-Rha-(1→2)-β-D-Fuc	PC-3	9.5±1.5		
	3-*O*-β-D-Gal-(1→2)-[β-D-Xyl-(1→3)]-β-D-GlcA-quillaic acid-28-*O*-β-D-Glc-(1→3)-[β-D-Xyl-(1→3)-β-D-Xyl-(1→4)]-α-L-Rha-(1→2)-β-D-Fuc	MDA-MB-231	8.5±1.3		
	tamoxifen (positive control)	MDA-MB-231 PC-3	19.7±1.7 23.4±2.5		
	cisplatin (positive control)	MDA-MB-231 PC-3	37.4±1.9 11.0±1.6		
Schima superba root bark			IC_{50} [μM] 48 h	MTT assay	(Wu et al. 2015)
	ternstroemiaside A	B16	3.52		
	maetenoside B	B16	3.24		
	yuchasaponin A	B16	4.83		
	sanchakasaponin F	B16	4.65		

	vinblastine (positive control)	B16	19.48		
Schumacheria castaneifolia leaves	3-*O*-α-L-Ara oleanolic acid paclitaxel (positive control)	NCI-H292 MRC-5 NCI-H292 MRC-5	IC_{50} [μg/mL] 24 h 4.33 48 h 2.69 72 h 1.50 24 h 5.40 48 h 4.59 72 h 2.83 24 h 8.37 48 h 3.28 72 h 1.59 24 h 1.51 48 h 0.96 72 h 0.35	SRB assay	(Samarakoon et al. 2017)
Silene odontopetala whole plant	3β,22α-dihydroxyolean-12-en-23-al-28-oic acid 3-*O*-α-L-Ara-(1→3)-β-D-GlcA 3β,22α-dihydroxyolean-12-en-28-oic acid 3-*O*-α-L-Ara-(1→3)-β-D-GlcA 21-*O*-β-D-Qui-(1→3)-β-D-Xyl 3β,21β-dihydroxyolean-12-en-23-al-28-oic acid 3-*O*-α-L-Ara-(1→3)-[β-D-Gal-(1→2)]-β-D-GlcA 21-*O*-β-D-Qui-(1→3)-β-D-Xyl 3β,21β-dihydroxyolean-12-en-28-oic acid 3-*O*-α-L-Ara-(1→3)-[β-D-Gal-(1→2)]-β-D-GlcA 21-*O*-β-D-Qui-(1→3)-β-D-Xyl 3β,21β-dihydroxyolean-12-en-23-al-28-oic acid	PC-3 A549 A549 A549 PC-3 A549 PC-3	IC_{50} [μM] 48 h 0.52±0.16 0.21±0.02 0.12±0.01 3.25±0.09 8.12±1.51 8.57±1.10 2.34±0.61	MTT assay	(Űn et al. 2020)

	azukisaponin IV doxorubicin (positive control)	A549 A549 PC-3	0.09±0.01 0.17±0.02 14.88±0.23		
Styrax japonica unripe fruit	jegosaponin A jegosaponin B	PC-3 PC-3	LC_{50} [μM] 48 h 0.7 1.6	CellTiter-Glo luminescent cell viability assay	(Nishimura et al. 2021)
Terminalia ivorensis bark	ivorenoside A cisplatin (positive control)	MDA-MB-231 HCT 116 MDA-MB-231 HCT 116	IC_{50} [μM] 72 h 3.96 3.43 7.38 5.59	MTT assay	(Ponou et al. 2010)
Terminalia tropophylla roots	terminaliaside A	A2780	IC_{50} [μM] 48 h 1.2	alamarBlue assay	(Cao et al. 2010)
Ternstroemia cherryi fruits and leaves	ternstroenol A ternstroenol B ternstroenol C ternstroenol D	U-87 MG U-251 MG U-87 MG U-87 MG U-251 MG U-87 MG	IC_{50} [μM] 72 h 3.63 5.28 8.64 7.22 7.20 9.54	SRB assay	(Singh et al. 2020)
Tetrapleura tetraptera fruits	aridanin	CCRF-CEM CEM/ADR5000 MDA-MB-231-*pcDNA* MDA-MB-231-*BCRP* HCT 116 *p53+/+* HCT 116 *p53−/−* U-87 MG U-87 MG.Δ*EGFR*	IC_{50} [μM] 72 h 3.18±0.47 4.80±0.28 5.02±0.66 5.87±0.45 8.25±1.01 6.34±0.62 5.84±0.46 5.38±0.67	alamarBlue assay	(Mbaveng et al. 2020)

		HepG2	9.56±0.88		
		MaMel-80a	5.50±0.31		
		SK-MEL-28	8.08±0.76		
		A2058	7.95±0.64		
		Mel-2a	5.96±0.68		
		MV3	5.44±0.40		
		SK-MEL-505	6.90±0.55		
		CC531	8.66±1.04		
		B16F1	8.45±0.52		
		B16F10	6.10±0.33		
	doxorubicin	CCRF-CEM	0.02±0.00		
	(positive control	CEM/ADR5000	122.96±10.94		
		MDA-MB-231-*pcDNA*	0.13±0.01		
		MDA-MB-231-*BCRP*	0.79±0.08		
		HCT 116 *p53+/+*	0.48±0.06		
		HCT 116 *p53−/−*	1.78±0,08		
		U-87 MG	0.26±0.03		
		U-87 MG.Δ*EGFR*	0.98±0.07		
		HepG2	4.56±0.46		
		MaMel-80a	8.66±0.56		
		SK-MEL-28	2.14±0.12		
		A2058	0.29±0.04		
		Mel-2a	6.63±0.41		
		MV3	7.09±0.59		
		SK-MEL-505	9.39±1.01		
		CC531	0.44±0.23		
		B16F1	0.22±0.01		
		B16F10	0.24±0.03		
Xanthoceras sorbifolia seeds oil leavings	bunkankasaponin B		IC_{50} [μM] [dng]	MTT assay	(Yu et al. 2012)
		HeLa	4.03±0.75		
		BGC-823	2.50±0.02		
		MCF-7	2.46±0.28		
		MDA-231	2.22±0.36		
		PC-3	2.58±0.22		
		HepG2	4.03±0.75		
		A549	3.03±0.04		
		A375-S2	4.14±0.32		

		HT1080 HEp-2	1.14±0.03 4.72±0.05		
	bunkankasaponin F	HeLa MCF-7 MDA-231 PC-3 HepG2 A549 A375-S2 HT1080 HEp-2	4.97±0.53 4.30±0.09 3.24±0.48 2.28±0.05 2.45±0.58 5.76±0.47 5.22±1.75 1.75±0.10 4.97±0.28		
	5-FU (positive control)	HeLa BGC-823 MCF-7 MDA-231 PC-3 HepG2 A549 A375-S2 HT1080 HEp-2	10.36±1.11 15.65±1.02 24.58±3.23 31.57±0.21 35.75±0.28 10.45±0.45 31.52±0.36 9.92±0.75 3.06±0.42 24.58±3.23		
semi-synthesis	(20S)-G-Rh2	HUV-EC-C	IC_{50} [μg/mL] 48 h 5.283±0.048	MTT assay	(Li et al. 2020a)
commercial source	Pulsatilla saponin D	NCI-H460 SMMC-7721 HCT 116 U-251 MG	IC_{50} [μM] 48 h 5.6±0.3 8.7±0.9 3.6±00 8.5±0.5	MTT assay	(Guan et al. 2020)
	raddeanoside R13	NCI-H460 SMMC-7721 HCT 116 U-251 MG	5.1±0.1 2.9±0.1 3.9±0.1 7.0±0.5		
	Pulsatilla saponin A	HCT 116	9.9±0.5		
	cisplatin	NCI-H460 SMMC-7721	10.3±0.3 8.0±0.3		

		HCT 116 U-251 MG	13.6±0.3 44.6±7.6		
commercial source	saikosaponin D	MDA-MB-231	IC_{50} [μM] 24 h 9.9±0.24	MTT assay	(Fu et al. 2020)
semi-synthesis	spinasaponin A methyl ester (oleanolic acid 3-*O*-[β-D-Glc-(1→3)-β-D-GlcA-6-*O*-methyl ester]) calenduloside G methyl ester (oleanolic acid 3-*O*-[β-D-Gal-(1→3)-β-D-GlcA-6-*O*-methyl ester])	MCF-7 HepG2 MCF-7 HepG2 K562	IC_{50} [μM] 48 h 4.52 8.36 1.87 2.24 2.36	MTT assay	(Gao et al. 2012)
semi-synthesis	28-*O*-α-L-Rha-betulin 3β-*O*-α-L-Ara 28-*O*-α-D-Ido-betulin 3β-*O*-α-L-Ara 28-*O*-α-L-Ara-betulin 3β-*O*-α-L-Rha 28-*O*-α-L-Ara-betulin 3β-*O*-α-D-Man 28-*O*-α-L-Ara-betulin 3β-*O*-α-D-Ido	CEM MCF-7 HeLa G-361 BJ HeLa BJ CEM MCF-7 HeLa G-361 BJ MCF-7 HeLa G-361 G-361 BJ	IC_{50} [μM] 72 h 2.6±0.1 1.6±0.0 1.2±0.1 0.9±0.1 1.3±0.4 4.0±0.8 4.6±0.0 2.4±0.0 1.7±0.1 1.5±0.2 1.1±0.2 1.5±0.1 7.3±1.8 8.6±0.1 5.2±0.6 7.2±0.3 8.6±0.5	alamarBlue assay	(Korda et al. 2020)

	betulin bis-3,28-α-D-Ido	MCF-7 HeLa G-361 BJ	9.8±1.3 8.8±1.6 6.7±0.1 5.9±1.0		
semi-synthesis	3-*O*-α-L-Rha-(1→2)-β-D-Xyl-oleanolic acid 28 *O*-α-L-Rha-(1→4)-β-D-Glc-(1→6)-O-β-D-Glc	HL-60 A375	IC_{50} [μM] 72 h 3.2±1.0 7.3±1.4	MTT assay (HL-60) SRB assay (A549, A375)	(Liu et al. 2013)
	3-*O*-β-D-Glc-(1→3)-α-L-Rha-(1→2)-α-L-Ara oleanolic acid	HL-60	6.1±2.3		
	3-*O*-β-D-Glc-(1→3)- α-L-Rha-(1→2)-β-D-Xyl oleanolic acid	HL-60 A375	4.6±2.9 5.5±1.7		
	3-*O*-β-D-Glc-(1→2)-β-D-Gal oleanolic acid	A375	9.7±2.3		
	3-*O*-β-D-Glc-(1→4)-β-D-Glc-(1→3)- α-L-Rha-(1→2)-β-D-Xyl oleanolic acid	HL-60 A549 A375	3.5±1.3 7.9±1.3 5.9±0.9		
	3-*O*-β-D-Glc-(1→4)-β-D-Glc-(1→3)-α-L-Rha-(1→2)-[β-D-Glc-(1→6)] -α-L-Ara oleanolic acid	HL-60 A549 A375	3.1±1.8 6.2±1.1 3.5±0.4		
	3-*O*-α-L-Rha-(1→2)-α-L-Ara oleanolic acid	HL-60 A375	9.2±2.9 8.4±1.8		
	3-*O*-β-D-Xyl-(1→3)-α-L-Rha-(1→2)-α-L-Ara oleanolic acid	HL-60 A375	3.4 ±1.2 8.9±2.4		
	3-*O*-β-D-Glc-(1→4)-β-D-Xyl-(1→3)-α-L-Rha-(1→2)-α-L-Ara oleanolic acid	HL-60	4.2±0.3		

	3-*O*-β-D-Glc-(1→4)-β-D-Xyl-(1→3)-α-L-Rha-(1→2)-β-D-Xyl-oleanolic acid	HL-60 A375	4.5±1.5 6.3±2.9		
	adriamycin (positive control)	HL-60 A549 A375	0.90±0.3 0.56±0.2 0.75±0.1		
	hydroxycamptothecin (positive control)	HL-60 A549 A375	0.25±0.1 0.30±0.1 0.15±0.1		

Abbreviations: ^{dng} data not given

- **human cancer cell lines**: breast: BT-549, MCF-7, MDA-231, MDA-MB-157, MDA-MB-231, SK-BR-3, T-47D; cervix: Bcap-37, HeLa, KB, L02, SPC-A-1; colon: Caco-2, HT-29, HCT-8, HCT 116, H-116, HCT-15, HCT15/CL02, LoVo, LS 180, SW480, SW626, WiDr; esophagus: ECA-109; duodenum: AZ521; glioma: GSC-18#, Hs683, LN18, T98G, TG1, TG1 GSCs, U-87 MG, U-251 MG, U373; larynx: HEp-2; leukemia: CCRF-CEM, CEM/ADR5000, HL-60, Jurkat, K562; liver: Hep3B, HepG2, HepG2/3A, HepG2/ADM, H7402, HuH-7, C3A, BEL-7402, SK-Hep-1, SMMC-7721; lung: A549, H-157, H-446, H-460, H522, LTEP-a-2, NCI-H1299, NCI-H460, NCI-H292; melanoma: A2058, A375, A375.S2, BLM, G-361, HTB140, MaMel-80a, Mel-2a, MV3, SK-MEL-2, SK-MEL-28, SK-MEL-505; neuroblastoma: SH-SY5Y; ovary: A2780, HEY, OVCAR, OVCAR-3, SK-OV-3; pancreas: BxPC-3, CFPAC-1, MIA Paca-2, PANC-1; prostate: DU145, PC-3; 22RV1; sarcoma: HT1080, RD; stomach: AGS, BCG, BCG-803, BGC-823, KATO III, MGC-803, MKN-28, MKN-45, NCI-N87, SGC-7901, SNU-1; urinary bladder: 5637, EJ, RT-112; uterus: MES-SA, MES-SA/DX5

- **animal cancer cell lines**: colon: CC531; melanoma: B16, B16F1, B16F10, mammary gland: 4T1; sarcoma: WEHI-164, J-774

- **human normal cell lines**: fibroblasts: BJ, DMEM; lung fibroblasts: MRC-5, W138; keratinocytes: HaCaT; kidney embryonic: HEK293; prostate: epithelial cells: PNT-2; vascular endothelial: HUV-EC-C

- **animal normal cell lines**: liver, hepatic stellate cells: HSC-T6, macrophage: RAW 264.7

Table S2 SAR studies on various types of oleanane saponins

Saponin type	**Cell line**	**References**
Oleanolic acid (OA)-type	A549	(Wang et al. 2012a; Liu et al. 2013; Xu et al. 2013; Lv et al. 2021)

	HL-60	(Liang et al. 2010; Quang et al. 2012; Liao et al. 2013; Li et al. 2013b; Liu et al. 2013; Tian et al. 2013)
	HepG2	(Tian et al. 2013; Bai et al. 2017; Yang et al. 2017; Huong et al. 2019)
	HeLa	(Liao et al. 2013; Kaennakam et al. 2018)
	PANC-1	(Huong et al. 2019; Lv et al. 2021)
	SGC-7901	(Tian et al. 2013; Xu et al. 2013)
	HL-7702	(Xu et al. 2013)
	MDA-MB-231	(Lv et al. 2021)
	SMMC-7721	(Liao et al. 2013)
	HCT 116	(Liang et al. 2010)
	KB	(Kaennakam et al. 2018)
	PC-3	(Gong et al. 2013)
	NCI-N87, OVCAR-8, MIA Paca2, RD	(Huong et al. 2019)
	A375	(Liu et al. 2013)
Hederagenin (HE)-type	A549	(Wang et al. 2013; Xu et al. 2013; Ozer et al. 2018; Zhang et al. 2018c; Huong et al. 2019)
	HeLa	(Wang et al. 2013; Ozer et al. 2018)
	PANC-1	(Ozer et al. 2018; Huong et al. 2019)
	SGC-7901	(Xu et al. 2013)

	HepG2	(Wang et al. 2013; Zhang et al. 2018c; Huong et al. 2019)
	MCF-7	(Quang et al. 2012; Zhang et al. 2018c; Huong et al. 2019)
	HL-60	(Quang et al. 2012; Li et al. 2013b; Wang et al. 2013)
	SH-SY5Y	(Ozer et al. 2018)
	HL-7702	(Xu et al. 2013)
	HCT 116	(Quang et al. 2012)
	HEK293	(Ozer et al. 2018)
	U-87 MG	(Wang et al. 2013)
	NCI-N87, OVCAR-8, MIA Paca2, RD	(Huong et al. 2019)
Echinocystic acid (EA)-type	HL-60, A549, Du-145	(Zhang et al. 2013)

Abbreviations:

- **human cancer cell lines**: breast: MCF-7, MDA-MB-231; cervix: HeLa, KB; colon: HCT 116; glioma: U-87 MG; leukemia: HL-60; liver: HepG2, SMMC-7721; lung: A549; melanoma: A375; neuroblastoma: SH-SY5Y; ovary: OVCAR-8; pancreas: MIA Paca-2, PANC-1; prostate: DU145, PC-3; sarcoma: RD; stomach: NCI-N87, SGC-7901

- **human normal cell lines**: kidney embryonic: HEK293; liver: HL-7702

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