A Topoisomerase-II-Inhibitor

*Unless otherwise noted all references are to Duke, James A. 1992. Handbook of phytochemical constituents of GRAS herbs and other economic plants. Boca Raton, FL. CRC Press.

Chemical	Dosage	References
WOODFORTICOSIN	--	Kikuchi, T., Kadota, S., Yokumoto, H., Motegi, a., Takahashi, K. 1991. Woodforticosin as Inhibitor of Topoisomerase and Neoplasms. Patent, Japan Kokai Tokkyo Koho-03 123, 793. 6pp.
WOODFORDIN-C	2.5 ug/ml	Kuramochi-Motegi, A., et al. 1992. Woodfruticosin (Woodfordin C), a New Inhibitor of DNA Topoisomerase II. Experimental Antitumor Activity. Biochem Pharmacol, 44: 1961-1965.
WAKAYIN	250 uM	Copp, B. R., Ireland, C. M., Barrows, L. R. 1991. Wakayin: A Novel Cytotoxic Pyrroloiminoquinone Alkaloid From the Ascidian Clavelina Species. J Org Chem, 56: 4596-4597.
VIRENAMIDE-A	IC50=2.5 ug/ml	Carroll, A. R., Feng, Y. J., Bowden, B. F., Coll, J. C. 1996. Studies of Australian Ascidians. 5. Virenamides A-C, New Cytotoxic Linear Peptides From the Colonial Didemnid Ascidian Diplosoma Virens. J Org Chem, 61: 4059-4061.
VESCALAGIN-CARBOXYLIC-ACID	IC100=0.2 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
VESCALAGIN	IC100=0.5 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
TERPENTECIN	100 uM	*
TERCHEBIN	IC100=0.2 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
TENIPOSIDE	1-20 uM	*
STRICTININ	IC100=0.5 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
STAUROSPORINE	IC50=1 uM	Lassota, P., Singh, G., Kramer, R. 1996. Mechanism of Topoisomerase II Inhibition by Staurosporine and Other Protein Kinase Inhibitors. J Biol Chem, 271: 26418-26423.
STAUROSPORINE	50 nM	Azuma, Y., Onishi, Y., Sato, Y., Kizaki, H. 1995. Effects of Protein Tyrosine Kinase Inhibitors With Different Modes of Action on Topoisomerase Activity and Death of IL-2-Dependent CTLL-2-Cells. J Biochemistry, 118: 312-318.
SHERMILAMINE-C	IC90=138 uM	McDonald, L. A., et al . 1994. Inhibition of Topoisomerase II Catalytic Activity by Pyridoacridine Alkaloids From a Cystodytes sp. ascidian: A Mechanism for the Apparent Intercalator-Induced Inhibition of Topoisomerase II. J Med Chem, 37: 3819-3827.
SHERMILAMINE-B	75 uM	Schmitz, F. J., et al. 1991. Cytotoxic Aromatic Alkaloids From the Ascidian Amphicarpa meridiana and Leptoclinides sp.: Meridine and 11-hydroxyascididemin. J Org Chem, 56: 804-808.
SHERMILAMINE-B	IC90=118 uM	McDonald, L. A., et al . 1994. Inhibition of Topoisomerase II Catalytic Activity by Pyridoacridine Alkaloids From a Cystodytes sp. ascidian: A Mechanism for the Apparent Intercalator-Induced Inhibition of Topoisomerase II. J Med Chem, 37: 3819-3827.
SERPENTINE	50 uM	Dassonneville, L., et al. 1999. Stimulation of Topoisomerase II-Mediated DNA Cleavage by Three DNA-Intercalating Plant Alkaloids: Cyrptolepine, Matadine, and Serpentine. Biochemistry, 38: 7719-7726.
SECOADOCIAQUINONE-B	IC90=113 uM	Concepcion, G. P., Foderaro, T. A., Eldredge, G. S., Lobkovsky, E., Clardy, J., Barrows, L. R., Ireland, C. M. 1995. Topoisomerase II-Mediated DNA Cleavage by Adocia- and Xestoquinones From the Philippine Sponge Xestospongia sp. J Med Chem, 38: 4503-4507.
SECOADOCIAQUINONE-A	IC90=113 uM	Concepcion, G. P., Foderaro, T. A., Eldredge, G. S., Lobkovsky, E., Clardy, J., Barrows, L. R., Ireland, C. M. 1995. Topoisomerase II-Mediated DNA Cleavage by Adocia- and Xestoquinones From the Philippine Sponge Xestospongia sp. J Med Chem, 38: 4503-4507.
SANGUIIN-H-6	IC100=0.2 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
SANGUIIN-H-6	IC50=0.01-0.16 uM	Bastow, K.F., Bori, I.D., Fukushima, Y., Kashiwada, Y., Tanaka, T., Nonaka, G., Nishioka, I., Lee, K.H. 1993. Inhibition of DNA Topoisomerases by Sanguiin H-6, a Cytotoxic Dimeric Ellagitannin From Sanguisorba officinalis. Planta Medica, 59: 240-245.
SANGUIIN-H-2	IC100=0.2 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
SANGUIIN-H-11	IC100=0.2 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
SAINTOPIN	2.5 uM	Yamashita, Y., Saitoh, Y., Ando, K., Takahasi, K., Ohno, H., Nakano, H. 1990. Saintopin, a New Antitumor Antibiotic With Topoisomerase II Dependent DNA Cleavage Activity, From Paecilomyces. J Antibiot, 43: 1344-1346.
RUTIN	IC50=1 ug/ml	Bernard, F. X., Sable, S., Cameron, B., Provost, J., Desnottes, J. F., Crouzet, J., Blanche, F. 1997. Glycosylated Flavones as Selective Inhibitors of Topoisomerase IV. Antimicrobial Agents & Chemotherapy, 41: 992-998.

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Chemical	Dosage	References
RUBRAXANTHONE	IC50=39 ug/ml	Iinuma, T., Nozaki, H. 1998. Antitumor Agents Containing Xanthones as Topoisomerase Inhibitors. Patent, Japan Kokai Tokkyo Koho-10 203,977. 10pp.
RETINOIC-ACID	0.03 uM	Rappa, G., Lorico, A., Sartorelli, A. C. 1990. Induction of the Differentiation of WEHI-3B D+ Monomyelocytic Leukemia Cells by Inhibitors of Topoisomerase II. Cancer Research, 50: 6723-6730.
RESVERATROL	IC50=49 uM	Sun, N. J., Woo, S. H., Cassady, J. M., Snapka, R. M. 1998. DNA Polymerase and Topoisomerase II Inhibitors From Psoralea corylifolia. J Natural Products, 61: 362-366.
RABDOSIN	50 uM	Kashiwada, Y., Bastow, K. F., Lee, K. H. 1995. Novel Lignan Derivatives as Selective Inhibitors of DNA Topoisomerase II. Bioorg Med Chem Lett, 5: 905-908.
QUERCETIN-3-O-BETA-D-GALACTOSE-(1,6)-O-ALPHA-L-RHAMNOSE	IC50=5 ug/ml	Bernard, F. X., Sable, S., Cameron, B., Provost, J., Desnottes, J. F., Crouzet, J., Blanche, F. 1997. Glycosylated Flavones as Selective Inhibitors of Topoisomerase IV. Antimicrobial Agents & Chemotherapy, 41: 992-998.
QUERCETIN	IC50=23-40 uM	*
QUERCETIN	IC50=1-6.9 ug/ml	*
PUNICALIN	IC100=0.5 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
PUNICALAGIN	IC100=0.2 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
PUNICAFOLIN	IC100=0.2 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
PUNICACORTEIN-C	IC100=0.5 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
PSORALEN	ID50=10 mM	Hu, C. Q., Lee, K. S. 1992. Coumarins From the Roots of Seseli mairei and Inhibition of DNA Topoisomerase II Activity. Tianran Chanwu Yanjiu Yu Kaifa, 4: 6-10.
POPOLOHUANON-E	IC50=400 nM	Carney, J. R., Scheuer, P. J. 1993. Popolohuanone E, a Topoisomerase-II Inhibitor With Selective Lung Tumor Cytotoxicity From the Pohnpei Sponge Dysidea sp. Tetrahedron Letters, 34: 3727-3730.
PODOPHYLLOTOXONE	10 ug/ml	Figgitt, D. P., Denyer, S. P., Dewick, P. M., Jaackson, D. E., Williams, P. Differential Sensitivity of Fungal Topoisomerases to Podophyllotoxin Derivatives. J Pharm Pharmacol Suppl, 41: 44pp.
PODOPHYLLOTOXIN	10 ug/ml	*
PHLORETIN	IC50=46.1 ug/ml	Constantinou, A., Mehta, R., Runyan, C., Rao, K., Vaughan, A., Moon, R. 1995. Flavonoids as DNA Topoisomerase Antagonists and Poisons: Structure-Activity Relationships. J Natural Products, 58: 217-225.
PHILLYRAEOIDIN-A	IC100=0.5 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
PEPANDUSINIC-ACID-B	IC100=0.2 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
PEPANDUSINIC-ACID-A	IC100=0.5 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
PEDUNCULAGIN	IC100=0.5 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
PATELLIN-6	IC50=2.5 ug/ml	Carroll, A. R., et al. 1996. Patellins 1-6 and Trunkamide A: Novel Cyclic Hexa, Hepta- and Octa-Peptides From Colonial Asidians, Lissoclinum sp. Aust J Chem, 49: 659-667.
NUPHARIN-A	IC100=0.2 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
NOVOBIOCIN	150 uM	*
NOR-DAMNACANTHAL	IC50=20 ug/ml	Tosa, H., Inuma, M. K., Asai, F., Tanaka, T., Nozaki, H., Ikeda, S., Tsutsui, K., Yamada, M., Fujimori, S. 1998. Anthraquinones From Neonauclea calycina and Their Inhibitory Activity Against DNA Topoisomerase II. Biol Pharm Bull, 21: 641-642.
NITIDINE	40 uM	Wang, L. K., Johnson, R. K., Hecht, S. M. 1993. Inhibition of Topoisomerase I Function by Nitidine and Fagaronine. Chem Res Toxicol, 6: 813-818.
MYRICETIN	IC50=11.9 ug/ml	*
MORINDONE	IC50=21 ug/ml	Tosa, H., Inuma, M. K., Asai, F., Tanaka, T., Nozaki, H., Ikeda, S., Tsutsui, K., Yamada, M., Fujimori, S. 1998. Anthraquinones From Neonauclea calycina and Their Inhibitory Activity Against DNA Topoisomerase II. Biol Pharm Bull, 21: 641-642.

Chemical	Dosage	References
MORIN	IC50=40.8 ug/ml	Constantinou, A., Mehta, R., Runyan, C., Rao, K., Vaughan, A., Moon, R. 1995. Flavonoids as DNA Topoisomerase Antagonists and Poisons: Structure-Activity Relationships. J Natural Products, 58: 217-225.
MATADINE	50 uM	Dassonneville, L., et al. 1999. Stimulation of Topoisomerase II-Mediated DNA Cleavage by Three DNA-Intercalating Plant Alkaloids: Cyrptolepine, Matadine, and Serpentine. Biochemistry, 38: 7719-7726.
MALLOTUSINIC-ACID	IC100=0.2 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
MALLOTINIC-ACID	IC100=0.5 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
MAKALUVONE	MIC=400 ug/ml	Barrows, L. R., Radisky, D. C., Copp, B. R., Swaffar, D. S., Kramer, R. A., Warters, R. L., Ireland, C. M. 1993. Makaluvamines, Marine Natural Products are Active Anti-Cancer Agents and DNA Topo II Inhibitors. Anticancer Drug Design, 8: 333-347.
MAKALUVAMINE-N	5 ug/ml	Venables, D. A., Concepcion, G. P., Matsumoto, S. S., Barrows, L. R., Ireland, C. M. 1997. Makaluvamine N: A New Pyrroloiminoquinone From Zyzzya fuliginosa. J Natural Products, 60: 408-410.
MAKALUVAMINE-F	IC50=25 uM	Radisky, D. C., Radisky, E. S., Barrows, L. R., Copp, B. R., Kramer, R. A., Ireland, C. M. 1993. Novel Cytotoxic Topoisomerase II Inhibiting Pyrroloiminoquinones From Fijian Sponges of the Genus Zyzzya. J Amer Chem Soc, 115: 1632-1638.
MAKALUVAMINE-F	MIC=13 ug/ml	Barrows, L. R., Radisky, D. C., Copp, B. R., Swaffar, D. S., Kramer, R. A., Warters, R. L., Ireland, C. M. 1993. Makaluvamines, Marine Natural Products are Active Anti-Cancer Agents and DNA Topo II Inhibitors. Anticancer Drug Design, 8: 333-347.
MAKALUVAMINE-E	IC50=310 uM	Radisky, D. C., Radisky, E. S., Barrows, L. R., Copp, B. R., Kramer, R. A., Ireland, C. M. 1993. Novel Cytotoxic Topoisomerase II Inhibiting Pyrroloiminoquinones From Fijian Sponges of the Genus Zyzzya. J Amer Chem Soc, 115: 1632-1638.
MAKALUVAMINE-E	MIC=133 ug/ml	Barrows, L. R., Radisky, D. C., Copp, B. R., Swaffar, D. S., Kramer, R. A., Warters, R. L., Ireland, C. M. 1993. Makaluvamines, Marine Natural Products are Active Anti-Cancer Agents and DNA Topo II Inhibitors. Anticancer Drug Design, 8: 333-347.
MAKALUVAMINE-D	MIC=133 ug/ml	Barrows, L. R., Radisky, D. C., Copp, B. R., Swaffar, D. S., Kramer, R. A., Warters, R. L., Ireland, C. M. 1993. Makaluvamines, Marine Natural Products are Active Anti-Cancer Agents and DNA Topo II Inhibitors. Anticancer Drug Design, 8: 333-347.
MAKALUVAMINE-D	IC50=320 uM	Radisky, D. C., Radisky, E. S., Barrows, L. R., Copp, B. R., Kramer, R. A., Ireland, C. M. 1993. Novel Cytotoxic Topoisomerase II Inhibiting Pyrroloiminoquinones From Fijian Sponges of the Genus Zyzzya. J Amer Chem Soc, 115: 1632-1638.
MAKALUVAMINE-C	MIC=133 ug/ml	Barrows, L. R., Radisky, D. C., Copp, B. R., Swaffar, D. S., Kramer, R. A., Warters, R. L., Ireland, C. M. 1993. Makaluvamines, Marine Natural Products are Active Anti-Cancer Agents and DNA Topo II Inhibitors. Anticancer Drug Design, 8: 333-347.
MAKALUVAMINE-B	IC50=420 uM	Radisky, D. C., Radisky, E. S., Barrows, L. R., Copp, B. R., Kramer, R. A., Ireland, C. M. 1993. Novel Cytotoxic Topoisomerase II Inhibiting Pyrroloiminoquinones From Fijian Sponges of the Genus Zyzzya. J Amer Chem Soc, 115: 1632-1638.
MAKALUVAMINE-B	MIC=400 ug/ml	Barrows, L. R., Radisky, D. C., Copp, B. R., Swaffar, D. S., Kramer, R. A., Warters, R. L., Ireland, C. M. 1993. Makaluvamines, Marine Natural Products are Active Anti-Cancer Agents and DNA Topo II Inhibitors. Anticancer Drug Design, 8: 333-347.
MAKALUVAMINE-A	IC50=41 uM	Radisky, D. C., Radisky, E. S., Barrows, L. R., Copp, B. R., Kramer, R. A., Ireland, C. M. 1993. Novel Cytotoxic Topoisomerase II Inhibiting Pyrroloiminoquinones From Fijian Sponges of the Genus Zyzzya. J Amer Chem Soc, 115: 1632-1638.
MAKALUVAMINE-A	MIC=13 ug/ml	Barrows, L. R., Radisky, D. C., Copp, B. R., Swaffar, D. S., Kramer, R. A., Warters, R. L., Ireland, C. M. 1993. Makaluvamines, Marine Natural Products are Active Anti-Cancer Agents and DNA Topo II Inhibitors. Anticancer Drug Design, 8: 333-347.
LIRIODENINE	IC50=0.11 uM	*
KUANONIAMINE-D	IC90=127 uM	McDonald, L. A., et al . 1994. Inhibition of Topoisomerase II Catalytic Activity by Pyridoacridine Alkaloids From a Cystodytes sp. ascidian: A Mechanism for the Apparent Intercalator-Induced Inhibition of Topoisomerase II. J Med Chem, 37: 3819-3827.
KAEMPFEROL	IC50=8.1 ug/ml	Constantinou, A., Mehta, R., Runyan, C., Rao, K., Vaughan, A., Moon, R. 1995. Flavonoids as DNA Topoisomerase Antagonists and Poisons: Structure-Activity Relationships. J Natural Products, 58: 217-225.
ISORABDOSIIN	50 uM	Kashiwada, Y., Bastow, K. F., Lee, K. H. 1995. Novel Lignan Derivatives as Selective Inhibitors of DNA Topoisomerase II. Bioorg Med Chem Lett, 5: 905-908.
ISOQUERCITRIN	550 ug/ml	Bernard, F. X., Sable, S., Cameron, B., Provost, J., Desnottes, J. F., Crouzet, J., Blanche, F. 1997. Glycosylated Flavones as Selective Inhibitors of Topoisomerase IV. Antimicrobial Agents & Chemotherapy, 41: 992-998.

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Chemical	Dosage	References
HERBIMYCIN-A	10 ug/ml	Azuma, Y., Onishi, Y., Sato, Y., Kizaki, H. 1995. Effects of Protein Tyrosine Kinase Inhibitors With Different Modes of Action on Topoisomerase Activity and Death of IL-2-Dependent CTLL-2-Cells. J Biochemistry, 118: 312-318.
HAMAMELITANNIN	IC100=100 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
GOSSYPOL	3.4 uM	*
GILVOCARCIN-V	1 ug/l	Lorico, A., Long, B. H. 1993. Biochemical Characterisation of Elsamicin and Other Coumarin-Related Antitumor Agents as Potent Inhibitors of Human Topoisomerase II. Eur J Cancer, 29: 1985-1991.
GERANIIN	IC100=0.5 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
GENISTEIN	IC50=30 ug/ml	Constantinou, A., Mehta, R., Runyan, C., Rao, K., Vaughan, A., Moon, R. 1995. Flavonoids as DNA Topoisomerase Antagonists and Poisons: Structure-Activity Relationships. J Natural Products, 58: 217-225.
GENISTEIN	IC50=1-150 uM	*
GENISTEIN	2-7.5 ug/ml	*
GENISTEIN	20 uM	Markovits, J., et al. 1989. Inhibitory Effects of the Tyrosine Kinase Inhibitor Genistein on Mammalian DNA Topoisomerase II. Cancer Research, 49: 5111-5117.
FUROSIN	IC100=0.5 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
FREDERICAMYCIN-A	7.4 uM	Latham, M. D., King, C. K., Gorycki, P., MacDonald, T. L., Ross, W. E. 1989. Inhibition of Topoisomerases by Fredericamycin A. Cancer Chemother Pharmacol, 24: 167-171.
FOSTRIECIN	100 uM (strong activity)	Boritzki, T. J., Wolfard, T. S., Besserer, J. A., Jackson, R. C., Fry, D. W. 1988. Inhibition of Type II Topoisomerase by Fostriecin. Biochem Pharmacol, 37: 4063-4068.
FISETIN	IC50=8.2 ug/ml	Constantinou, A., Mehta, R., Runyan, C., Rao, K., Vaughan, A., Moon, R. 1995. Flavonoids as DNA Topoisomerase Antagonists and Poisons: Structure-Activity Relationships. J Natural Products, 58: 217-225.
FAGARONINE	25-50 uM	*
EUGENIIN	IC100=0.5 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
ETOPOSIDE	IC50=59.2 uM	Terada, T., et al. 1992. Antitumor Agents. I. DNA Topoisomerase II Inhibitory Activity and the Structural Relationship of Podophyllotoxin Derivatives as Antitumor Agents. Chem Pharm Bull, 40: 2720-2727.
ETOPOSIDE	ID50=50 uM	*
ETOPOSIDE	10 ug/ml	Huff, A. C., Kreuzer, K. N. 1990. Evidence for a Common Mechanism of Action for Antitumor and Antibacterial Agents That Inhibit Type II DNA Topoisomerases. J Biol Chem, 265: 20496-20505.
ETOPOSIDE	2-50 uM	*
EPIPODOPHYLLOTOXIN	0.4 mM	Thurston, L. S., Irie, H., Tani, S., Han, F. S., Liu, Z. C., Cheng, Y. C., Lee, K. H. 1986. Antitumor Agents. 78. Inhibition of Human DNA Topoisomerase II by Podophyllotoxin and Alpha-peltatin Analogues. J Med Chem, 29: 1547-1550.
EPIMANOALIDE-25-ACETAL	IC50=25 uM	Kobayashi,M., Okamoto,T., Hayashi,K., Yokayama,N., Sasaki,T., Kitagawa,I. 1994. Marine Natural Products. XXXII. Absolute Configurations of C-4 of the Manoalide Family, Biologically Active Sesterterpenes From the Marine Sponge. Chem Pharm Bull, 42: 265-270
EMODIN	IC50=7 uM/ml	Mueller, S. O., Stopper, H. 1999. Characterization of the Genotoxicity of Anthraquinones in Mammalian Cells. Biochimica & Biophysica Acta, 1428: 406-414.
EMODIN	1 mM	Muller, S. O., Eckert, I., Lutz, W. K., Stopper, H. 1996. Genotoxicity of the Laxative Drug Components Emodin, Aloe-emodin and Danthron in Mammalian Cells: Topoisomerase II Mediated? Mutat Res, 371: 165-173.
ELSAMICIN	0.5 ug/l	Lorico, A., Long, B. H. 1993. Biochemical Characterisation of Elsamicin and Other Coumarin-Related Antitumor Agents as Potent Inhibitors of Human Topoisomerase II. Eur J Cancer, 29: 1985-1991.
ELLIPTICINE	20-40 uM	*
ELENIC-ACID	IC50=0.1 ug/ml	Juagdan, E. G., Kalidindi, R. S., Scheuer, P. J., Kelly-Borges, M. 1995. Elenic Acid, an Inhibitor of Topoisomerase II, From a Sponge, Plakinastrella sp. Tetrahedron Letters, 36: 2905-2908.
ELAEOCARPUSIN	IC100=0.5 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
DIPLAMINE	IC90=9.2 uM	McDonald, L. A., et al . 1994. Inhibition of Topoisomerase II Catalytic Activity by Pyridoacridine Alkaloids From a Cystodytes sp. ascidian: A Mechanism for the Apparent Intercalator-Induced Inhibition of Topoisomerase II. J Med Chem, 37: 3819-3827.

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Chemical	Dosage	References
DEOXYPODOPHYLLOTOXIN	10 ug/ml	Figgitt, D. P., Denyer, S. P., Dewick, P. M., Jaackson, D. E., Williams, P. Differential Sensitivity of Fungal Topoisomerases to Podophyllotoxin Derivatives. J Pharm Pharmacol Suppl, 41: 44pp.
DEOXYPODOPHYLLOTOXIN	IC50=186.5 uM	Terada, T., et al. 1992. Antitumor Agents. I. DNA Topoisomerase II Inhibitory Activity and the Structural Relationship of Podophyllotoxin Derivatives as Antitumor Agents. Chem Pharm Bull, 40: 2720-2727.
DEMETHOXYCURCUMIN	--	*
DEHYDROKUANONIAMINE-B	IC90=115 uM	McDonald, L. A., et al . 1994. Inhibition of Topoisomerase II Catalytic Activity by Pyridoacridine Alkaloids From a Cystodytes sp. ascidian: A Mechanism for the Apparent Intercalator-Induced Inhibition of Topoisomerase II. J Med Chem, 37: 3819-3827.
DAMNACANTHAL	IC50=20 ug/ml	Tosa, H., Inuma, M. K., Asai, F., Tanaka, T., Nozaki, H., Ikeda, S., Tsutsui, K., Yamada, M., Fujimori, S. 1998. Anthraquinones From Neonauclea calycina and Their Inhibitory Activity Against DNA Topoisomerase II. Biol Pharm Bull, 21: 641-642.
DAMIRONE-B	MIC=400 ug/ml	Barrows, L. R., Radisky, D. C., Copp, B. R., Swaffar, D. S., Kramer, R. A., Warters, R. L., Ireland, C. M. 1993. Makaluvamines, Marine Natural Products are Active Anti-Cancer Agents and DNA Topo II Inhibitors. Anticancer Drug Design, 8: 333-347.
DAIDZEIN	IC50=3.9 mM	Sun, N. J., Woo, S. H., Cassady, J. M., Snapka, R. M. 1998. DNA Polymerase and Topoisomerase II Inhibitors From Psoralea corylifolia. J Natural Products, 61: 362-366.
CYSTODYTIN-J	IC90=8.4 uM	McDonald, L. A., et al . 1994. Inhibition of Topoisomerase II Catalytic Activity by Pyridoacridine Alkaloids From a Cystodytes sp. ascidian: A Mechanism for the Apparent Intercalator-Induced Inhibition of Topoisomerase II. J Med Chem, 37: 3819-3827.
CURCUMIN	--	*
CRYPTOLEPINE	0.5-50 uM	*
CORILAGIN	IC100=0.5 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
COLUMBIANADIN	ID50=10 mM	Hu, C. Q., Lee, K. S. 1992. Coumarins From the Roots of Seseli mairei and Inhibition of DNA Topoisomerase II Activity. Tianran Chanwu Yanjiu Yu Kaifa, 4: 6-10.
CLEROCIDIN	100 uM	Kawada, S. Z., Yamashita, Y., Fujii, N., Nakano, H. 1991. Induction of a Heat-Stable Topoisomerase II-DNA Cleavable Complex by Nonintercalative Terpenoids, Terpentecin and Clerocidin. Cancer Research, 51: 2922-2925.
CHRYSOMYCIN-V	1 ug/l	Lorico, A., Long, B. H. 1993. Biochemical Characterisation of Elsamicin and Other Coumarin-Related Antitumor Agents as Potent Inhibitors of Human Topoisomerase II. Eur J Cancer, 29: 1985-1991.
CHRYSOMYCIN-M	5 ug/l	Lorico, A., Long, B. H. 1993. Biochemical Characterisation of Elsamicin and Other Coumarin-Related Antitumor Agents as Potent Inhibitors of Human Topoisomerase II. Eur J Cancer, 29: 1985-1991.
CHRYSAZIN	1 mM	Muller, S. O., Eckert, I., Lutz, W. K., Stopper, H. 1996. Genotoxicity of the Laxative Drug Components Emodin, Aloe-emodin and Danthron in Mammalian Cells: Topoisomerase II Mediated? Mutat Res, 371: 165-173.
CHRYSAZIN	IC50=61 uM/ml	Mueller, S. O., Stopper, H. 1999. Characterization of the Genotoxicity of Anthraquinones in Mammalian Cells. Biochimica & Biophysica Acta, 1428: 406-414.
CHEBULINIC-ACID	IC100=0.2 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
CHEBULAGIC-ACID	IC100=0.5 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
CHARTREUSIN	1 ug/l	Lorico, A., Long, B. H. 1993. Biochemical Characterisation of Elsamicin and Other Coumarin-Related Antitumor Agents as Potent Inhibitors of Human Topoisomerase II. Eur J Cancer, 29: 1985-1991.
CASUARININ	IC100=0.2 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
CASTANOPSININ-A	IC100=5-12.5 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
CASTALAGIN	IC100=0.2 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
CAMPTOTHECIN	--	Rose, K. M. 1988. DNA Topoisomerases as Targets for Chemotherapy. Faseb J, 2: 2474-2478.
CAFFEINE	99 mM	Shin, C. G., Strayer, J. M., Wani, M., Snapka, R. M. 1990. Rapid Evaluation of Topoisomerase Inhibitors: Caffeine Inhibition of Topoisomerases in vivo. Teratogen Carcinogen Mutagen, 10: 41-52.
BUFALIN	10 nM	Jing, Y. K., Watabe, M., Hashimoto, S., Nakajo, S., Nakaya, K. 1994. Cell Cycle Arrest and Protein Kinase Modulating Effect of Bufalin on Human Leukemia ML1 Cells. Anticancer Research, 14: 1193-1198.
BIS-DEMETHOXYCURCUMIN	25 ug/ml	*

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Chemical	Dosage	References
BIOCHANIN-A	50 ug/ml	Azuma, Y., Onishi, Y., Sato, Y., Kizaki, H. 1995. Effects of Protein Tyrosine Kinase Inhibitors With Different Modes of Action on Topoisomerase Activity and Death of IL-2-Dependent CTLL-2-Cells. J Biochemistry, 118: 312-318.
BETULIN	IC50=38.6 uM	*
BETA-BOSWELLIC-ACID-ACETATE	--	Lee, Y. W., Fang, Q. C., Wang, Z. G., Li, D., Cook, C. E. 1990. Pentacyclic Triterpenoid Compounds as Topoisomerase Inhibitors or Cell Differentiation Inducers. Patent-Pct Int Appl-90 01,937. 54pp.
BERBERRUBINE	2.5 uM	Kobayashi, Y, Yamashita, Y., Fujii, N., Takaboshi, K., Kawakami, T., Kawamura, M., Mizukami, T., Nakano, H. 1995. Inhibitors of DNA Topoisomerase I and II Isolated From the Coptis Rhizomes. Planta Medica, 61: 414-418.
BERBERINE	2.5 uM	Kobayashi, Y, Yamashita, Y., Fujii, N., Takaboshi, K., Kawakami, T., Kawamura, M., Mizukami, T., Nakano, H. 1995. Inhibitors of DNA Topoisomerase I and II Isolated From the Coptis Rhizomes. Planta Medica, 61: 414-418.
BERBERASTINE	2.5 uM	Kobayashi, Y, Yamashita, Y., Fujii, N., Takaboshi, K., Kawakami, T., Kawamura, M., Mizukami, T., Nakano, H. 1995. Inhibitors of DNA Topoisomerase I and II Isolated From the Coptis Rhizomes. Planta Medica, 61: 414-418.
BASTADIN-14	IC50=2 ug/ml	Carney, J. R., Scheuer, P. J., Borge, M. K. 1993. A New Bastadin From the Sponge Psammaplysilla purpurea. J Natural Products, 56: 153-157.
BAKUCHICIN	IC50=404 uM	Sun, N. J., Woo, S. H., Cassady, J. M., Snapka, R. M. 1998. DNA Polymerase and Topoisomerase II Inhibitors From Psoralea corylifolia. J Natural Products, 61: 362-366.
BAICALEIN	200 ug/ml	Matsuzaki, Y., Kurokawa, N., Terai, S., Matsumura, Y., Kobayashi, N., Okita, K. 1996. Cell Death Induced by Baicalein in Human Hepatocellular Carcinoma Cell Lines. Jap J Cancer Res, 87: 170-177.
ASCIDIDEMIN	30 uM	Schmitz, F. J., et al. 1991. Cytotoxic Aromatic Alkaloids From the Ascidian Amphicarpa meridiana and Leptoclinides sp.: Meridine and 11-hydroxyascididemin. J Org Chem, 56: 804-808.
APIODIONEN	250 ug/ml	Takahashi, H., Shiraishi, A., Iizuka, Y., Furuya, K., Kagasaki, T. 1992. Manufacture of Anticancer and Anti-Inflammatory Apiodionen With Apiosordaria. Patent, Japan Kokai Tokkyo Koho-04 49,289. 8pp.
APIGENIN	IC45=180 uM	*
APIGENIN	50 ug/ml	Azuma, Y., Onishi, Y., Sato, Y., Kizaki, H. 1995. Effects of Protein Tyrosine Kinase Inhibitors With Different Modes of Action on Topoisomerase Activity and Death of IL-2-Dependent CTLL-2-Cells. J Biochemistry, 118: 312-318.
APIGENIN	IC28=18 uM	*
ALPHA-PELTATIN	--	Thurston, L. S., Lee, K. H., Han, F. S., Liu, Z. C., Cheng, Y. C. Inhibition of Human DNA Topoisomerase II by Podophyllatoxin Analogues. Abstract Internat Res Cong Nat Prod Coll Pharm University N Carolina, Chapel Hill NC, July 1985.
ALPHA-BOSWELLIC-ACID-ACETATE	IC>25=5 uM	*
ALOE-EMODIN	1 mM	Muller, S. O., Eckert, I., Lutz, W. K., Stopper, H. 1996. Genotoxicity of the Laxative Drug Components Emodin, Aloe-emodin and Danthron in Mammalian Cells: Topoisomerase II Mediated? Mutat Res, 371: 165-173.
ALOE-EMODIN	IC50=741 uM/ml	Mueller, S. O., Stopper, H. 1999. Characterization of the Genotoxicity of Anthraquinones in Mammalian Cells. Biochimica & Biophysica Acta, 1428: 406-414.
ADRIAMYCIN	--	Rose, K. M. 1988. DNA Topoisomerases as Targets for Chemotherapy. Faseb J, 2: 2474-2478.
ADOCIAQUINONE-B	--	Concepcion, G. P., Foderaro, T. A., Eldredge, G. S., Lobkovsky, E., Clardy, J., Barrows, L. R., Ireland, C. M. 1995. Topoisomerase II-Mediated DNA Cleavage by Adocia- and Xestoquinones From the Philippine Sponge Xestospongia sp. J Med Chem, 38: 4503-4507.
ADOCIAQUINONE-A	IC90=118 uM	Concepcion, G. P., Foderaro, T. A., Eldredge, G. S., Lobkovsky, E., Clardy, J., Barrows, L. R., Ireland, C. M. 1995. Topoisomerase II-Mediated DNA Cleavage by Adocia- and Xestoquinones From the Philippine Sponge Xestospongia sp. J Med Chem, 38: 4503-4507.
ACTINOMYCIN-D	--	Rose, K. M. 1988. DNA Topoisomerases as Targets for Chemotherapy. Faseb J, 2: 2474-2478.
ACLARUBICIN	1 uM	Jensen, P.B., et al.1990.Antagonistic Effect of Aclarubicin on the Cytotoxicity of Etoposide and 4'-(9-acridinylamino)-methanesulfon-m-anisidide in Human Small Cell Lung Cancer Cell Lines and on Topoisomerase II-Mediated DNA Clev. Cancer Res,50:3311-3316.
ACLACINOMYCIN-A	7 uM	Rappa, G., Lorico, A., Sartorelli, A. C. 1990. Induction of the Differentiation of WEHI-3B D+ Monomyelocytic Leukemia Cells by Inhibitors of Topoisomerase II. Cancer Research, 50: 6723-6730.
ACETYL-UMBELLIFERONE	ID50=10 mM	Hu, C. Q., Lee, K. S. 1992. Coumarins From the Roots of Seseli mairei and Inhibition of DNA Topoisomerase II Activity. Tianran Chanwu Yanjiu Yu Kaifa, 4: 6-10.
5-METHYLPSORALEN	ID50=10 mM	Hu, C. Q., Lee, K. S. 1992. Coumarins From the Roots of Seseli mairei and Inhibition of DNA Topoisomerase II Activity. Tianran Chanwu Yanjiu Yu Kaifa, 4: 6-10.

Chemical	Dosage	References
4,5-DI-O-GALLOYL-QUINIC-ACID	IC100=100 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
4'-DEMETHYLPODOPHYLLOTOXIN	100 uM	Lee, K. H., et al. 1989. Antitumor Agents. 107. New Cytotoxic 4-alkylamino Analogues of 4'-demethyl-epipodophyllotoxin as Inhibitors of Human DNA Topoisomerase II. J Natural Products, 52: 606-613.
4'-DEMETHYLPODOPHYLLOTOXIN	10 ug/ml	Figgitt, D. P., Denyer, S. P., Dewick, P. M., Jaackson, D. E., Williams, P. Differential Sensitivity of Fungal Topoisomerases to Podophyllotoxin Derivatives. J Pharm Pharmacol Suppl, 41: 44pp.
4'-DEMETHYL-EPIPODOPHYLLOTOXIN	100 uM	Lee, K. H., et al. 1989. Antitumor Agents. 107. New Cytotoxic 4-alkylamino Analogues of 4'-demethyl-epipodophyllotoxin as Inhibitors of Human DNA Topoisomerase II. J Natural Products, 52: 606-613.
3-O-GALLOYLSHIKIMIC-ACID	IC100=5 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
3,5-DI-O-GALLOYLSHIKIMIC-ACID	IC100=5 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
3,4,5-TRI-O-GALLOYL-QUINIC-ACID	IC100=0.5 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
3',4'-DIDEMETHYL-EPIPODOPHYLLOTOXIN	0.4 mM	*
2,3-HEXAHYDROXYDIPHENOYL-D-GLUCOSE	IC100=100 mM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
2',3,5-TRI-O-GALLOYL-HAMAMELOSE	IC100=0.5 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
15-METHOXYXESTOQUINONE	IC90=143 uM	Concepcion, G. P., Foderaro, T. A., Eldredge, G. S., Lobkovsky, E., Clardy, J., Barrows, L. R., Ireland, C. M. 1995. Topoisomerase II-Mediated DNA Cleavage by Adocia- and Xestoquinones From the Philippine Sponge Xestospongia sp. J Med Chem, 38: 4503-4507.
15-CHLORO-14-HYDROXYXESTOQUINONE	IC90=135 uM	Concepcion, G. P., Foderaro, T. A., Eldredge, G. S., Lobkovsky, E., Clardy, J., Barrows, L. R., Ireland, C. M. 1995. Topoisomerase II-Mediated DNA Cleavage by Adocia- and Xestoquinones From the Philippine Sponge Xestospongia sp. J Med Chem, 38: 4503-4507.
14-METHOXYXESTOQUINONE	IC90=143 uM	Concepcion, G. P., Foderaro, T. A., Eldredge, G. S., Lobkovsky, E., Clardy, J., Barrows, L. R., Ireland, C. M. 1995. Topoisomerase II-Mediated DNA Cleavage by Adocia- and Xestoquinones From the Philippine Sponge Xestospongia sp. J Med Chem, 38: 4503-4507.
14-CHLORO-15-HYDROXYXESTOQUINONE	IC90=135 uM	Concepcion, G. P., Foderaro, T. A., Eldredge, G. S., Lobkovsky, E., Clardy, J., Barrows, L. R., Ireland, C. M. 1995. Topoisomerase II-Mediated DNA Cleavage by Adocia- and Xestoquinones From the Philippine Sponge Xestospongia sp. J Med Chem, 38: 4503-4507.
10-METHOXYLIRIODENINE	IC50=25 ug/ml	Harrigan, G. G., Gunatilaka, A. A. L., Kingston, D. G. I., Chan, G. W., Johnson, R. K. 1994. Isolation of Bioactive and Other Oxoaporphine Alkaloids From Two Annonaceous Plants, Xylopia aethiopica and X. muliusa cf. banacea. J Natural Products, 57: 68-73.
10-HYDROXYLIRIODENINE	IC50=12.5 ug/ml	Harrigan, G. G., Gunatilaka, A. A. L., Kingston, D. G. I., Chan, G. W., Johnson, R. K. 1994. Isolation of Bioactive and Other Oxoaporphine Alkaloids From Two Annonaceous Plants, Xylopia aethiopica and X. muliusa cf. banacea. J Natural Products, 57: 68-73.
1-BETA-GALLOYL-PEDUNCULAGIN	IC100=0.5 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
1-2-3-6-TETRA-O-GALLOYL-BETA-D-GLUCOSE	IC100=0.2 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
1,3,4,5-TETRA-O-GALLOYL-QUINIC-ACID	IC100=0.5 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
1,2,6-TRI-O-GALLOYL-BETA-D-GLUCOSE	IC100=0.2 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
1,2,3,4,6-PENTA-O-GALLOYL-BETA-D-GLUCOSE	IC100=0.2 uM	Kashiwada, Y., Nonaka, G. I., Nishioka, I., Lee, J. H., Bori, I., Fukushima, Y., Bastow, K. F., Lee, K. H. 1993. Tannins as Potent Inhibitors of DNA Topoisomerase II in vitro. J Pharm Sci, 82: 487-492.
(+)-DICENTRINE	IC50=27 uM	Woo, S. H., Sun, N. J., Cassady, J. M., Snapka, R. M. 1999. Topoisomerase II Inhibition by Aporphine Alkaloids. Biochem Pharmacol, 57: 1141-1145.

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