References on Simarouba (*Simarouba glauca, amara*) from Part 3 of *Fighting Cancer with Plants* from the Rainforest by Leslie Taylor

The published research referenced in the book which is shown below will include the initials **HS**, **IVT**, **IVA**, **REV**, **INS**, and **NEW**. HS refers to research conducted in humans; IVT refers to *in vitro* research conducted inside of test tubes; IVA refers to *in vivo* research conducted in animals; REV refers to a review article that evaluated and summarizes multiple studies on the subject; INS refers to *in silico* research (newer computer modeling including molecular docking studies) and NEW refers new biological research methods which determine genes and signaling pathways, and molecular pathways of actions which were developed during and after the Human Genome Project discussed in chapter 4.

This research below was last updated in August 2025. To view research published after that time, follow these links to the National Institute of Health's National Library of Medicine on **simarouba**, **ailanthinone**, **glaucarubinone**, **glaucarubolone**, **simalikalactone D**, **scopoletin**, and **holacanthone**.

Cancer Research on Simarouba and its Active Chemicals:

Reviews:

Dony, E., et al "Therapeutic potential of *Simarouba glauca* in treatment of oral diseases." *Res. J. Pharm. Tech.* 2023; 16(6): 2825-8. (**REV**)

Hussain, S., et al. "Pharmacological uses of *Simarouba glauca*: A review." *Plant Arch*. 2021 April; 21(1): 648-655. (**REV**)

Jose, A. et al. "Therapeutic potential of phytochemicals isolated from *Simarouba glauca* for inhibiting cancers: A review."
Sys. Rev. Pharm. 2019; 10(1): 73-80. [**Free Article**] (**REV**)

Dhanashri, P., et al. "Role of *Simarouba glauca* DC plant in cancer: A short review." *J. Stem Cells.* 2019 Dec; 14(2):103-109. (**REV**)

Antony, J., et al. "Review study on pharmacological importance of *Simarouba glauca*." *Intl. J. New Tech. Res.* 2016; (2)10: 59-62. (**REV**)

Fiaschetti, G., et al. "Quassinoids: From traditional drugs to new cancer therapeutics." *Curr. Med. Chem.* 2011; 18(3): 316-28. (**REV**)

Test Tube Studies on Multiple Cancer Cells Lines
(breast, cervix, colorectal, brain (glioblastoma) ovarian, prostate melanoma, lung and leukemia)

Thiagarajan, V., et al "Testing *Simarouba amara's* therapeutic effects against weedicide-induced tumor-like morphology in planarians." *J. Emerg. Invest.* 2024 Jan; 23: 174. (**IVT, IVA**)

Mendez, B., et al. “Simalikalactone D, a potential anticancer compound from *Simarouba tulae,* an endemic plant of Puerto Rico.” *Plants* (Basel). 2020 Jan; 9(1): 93. (**IVT, NEW**)
Jose, A., et al. “Anti-proliferative potential of phytochemical fractions isolated from *Simarouba glauca* DC leaf.” *Heliyon*. 2020 Apr; 6(4): e03836. (**IVT**)
Umesh, T. “*In-vitro* antioxidant potential, free radical scavenging and cytotoxic activity of *Simarouba glauca* leaves.” *Intl. J. Pharm. Pharma. Sci.* 2014; (2)3: 411-416. (**IVT**)
Dejos, C., et al. “Canthin-6-one displays antiproliferative activity and causes accumulation of cancer cells in the G2/M phase.” *J. Nat. Prod.* 2014 Nov; 77(11): 2481-7. (**IVT, NEW**)
de Mesquita, M., et al. "Cytotoxic activity of Brazilian cerrado plants used in traditional medicine against cancer cell lines." *J. Ethnopharmacol.* 2009 Jun 25; 123(3): 439-45. (**IVT**)
Rivero-Cruz, J., et al. "Cytotoxic constituents of the twigs of *Simarouba glauca* collected from a plot in Southern Florida." *Phytother. Res*. 2005; 19(2): 136-40. (**IVT**)
Waterman, P., et al. ‘Cytotoxic quassinoids from *Odyendyea gabonensis* stem bark: Isolation and high-field NMR.” *Planta Med.* 1984 Jun; 50(3): 261-3. (**IVT**)
Handa, S., et al. "Plant anticancer agents XXV. Constituents of *Soulamea soulameoides*." *J. Nat. Prod.* 1983; 46(3): 359-64. (**IVT**)
Polonsky, J., et al. “The isolation and structure of 13,18-dehydroglaucarubinone, a new antineoplastic quassinoid from *Simarouba amara*.” *Experientia*. 1978; 34(9): 1122–1123.
Ghosh, P., et al. "Antitumor plants. IV. Constituents of *Simarouba versicolor*." *Lloydia.* 1977; 40(4): 364-69. (**IVT**)
Ogura, M. et al. "Potential anticancer agents VI. Constituents of *Ailanthus excelsa* (Simaroubaceae)." *Lloydia.* 1977; 40(6): 579-84. (**IVT**)

Bladder Cancer:

Li, J., et al. “Ailanthone inhibits bladder cancer tumor and cell proliferation, epithelial-mesenchymal transition, and activation of the Janus kinase/signal transducer and activator of transcription 3 signaling pathway.” *Cytojournal*. 2025 Feb; 22: 16. (**IVA, NEW, INS**)
Puranik, S., et al. “Evaluation of *in vitro* antioxidant and anticancer activity of *Simarouba glauca* leaf extracts on T-24 bladder cancer cell line.” *Pharmacog. J.* 2017 Oct; 2017 9(6): 906-912. (**IVT, NEW**)

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Wang, R., et al. “Antitumour activity of 2-dihydroailanthone from the bark of *Ailanthus altissima* against U251.” *Pharm. Biol.* 2016 Sep; 54(9): 1641-8. (**IVT, NEW**)
Devkota, K., et al. "Compounds from *Simarouba berteroana* which inhibit proliferation of NF1-defective cancer cells." *Phytochem. Lett.* 2014 Feb; 7: 42-45. (**IVT, NEW**)
Beutler, J., et al. “Quassinoid inhibition of AP-1 function does not correlate with cytotoxicity or protein synthesis inhibition.” *J. Nat. Prod.* 2009 Mar; 72(3): 503-6. (**INS, IVT, NEW**)

von Bueren, A., et al. “Anti-proliferative activity of the quassinoid NBT-272 in childhood medulloblastoma cells.” *BMC Cancer.* 2007 Jan; 7: 19. (**IVT)**

.Breast Cancer:

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Pandhari, R et al. “*In-vitro* antioxidant activity and flow cytometric analysis of *Simarouba glauca* DC bark extract induced apoptosis in triple negative breast cancer cells.” *Asian Pac. J. Cancer Prev.* 2024 Jan; 25(1): 201-210. (**IVT, NEW**)
Ramasamy, S., et al. “Broad-spectrum antimicrobial, antioxidant, and anticancer studies of leaf extract of *Simarouba glauca* DC *in vitro*.” *Antibiotics* (Basel). 2022 Jan; 11(1): 59. (**IVT, NEW**)
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Badal, S., et al. "Glaucarubulone glucoside from *Castela macrophylla* suppresses MCF-7 breast cancer cell growth and attenuates benzo[a]pyrene-mediated CYP1A gene induction." *J. Appl. Toxicol*. 2017 Jul; 37(7): 873-883. (**IVT, NEW**)

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Wei, N., et al. “Quassinoid analogs exert potent antitumor activity via reversible protein biosynthesis inhibition in human colorectal cancer.” *Biochem. Pharmacol.* 2023 Jun; 212:115564. **(IVT, IVA, NEW)**
Jose, A., et al. "Tricaproin isolated from *Simarouba glauca* inhibits the growth of human colorectal carcinoma cell lines by targeting class-1 histone deacetylases." *Front. Pharmacol*. 2018 Mar; 9: 127. (**IVT, NEW**)
Huynh, N., et al. "Glaucarubinone inhibits colorectal cancer growth by suppression of hypoxia-inducible factor 1α and β-catenin via a p-21 activated kinase 1-dependent pathway." *Biochim. Biophys. Acta.* 2015 Jan; 1853(1): 157-65. (**IVA**, **IVT, NEW**)

Gastric Cancer:

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Biba, V., et al. “The apoptotic properties of leaf extracts of *Simarouba glauca* against human leukemic cancer cells.” *Asian Pac. J. Cancer Prev*. 2021 Apr; 22(4): 1305-1312. (**IVT, NEW**)
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Cuendet, M., and M. Pezzuto. “Antitumor activity of bruceantin: an old drug with new promise.” *J. Nat. Prod.* 2004 Feb; 67(2): 269-72. (**REV**)
Mata-Greenwood, E., et al. " Novel esters of glaucarubolone as inducers of terminal differentiation of promyelocytic HL-60 cells and inhibitors of 7,12-dimethylbenz[a]anthracene-induced preneoplastic lesion formation in mouse mammary organ culture." *J. Nat. Prod.* 2001; 64(12): 1509-13. (**IVA**, **IVT, NEW**)
Morre, D., et al. "Mode of action of the anticancer quassinoids - Inhibition of the plasma membrane NADH oxidase." *Life Sci.* 1998; 63(7) :595-604. (**IVT, NEW**)
Klocke, J., et al. "Growth inhibitory, insecticidal and antifeedant effects of some antileukemic and cytotoxic quassinoids on two species of agricultural pests." *Experientia.* 1985 Mar 15; 41(3): 379-82. (**IVT, IVA**)
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Di, J., et al. “Ailanthone increases cisplatin-induced apoptosis and autophagy in cisplatin resistance non-small cell lung cancer cells through the PI3K/AKT/mTOR pathway.” *Curr. Med. Chem.* 2024; Aug 26: 39192653. (**IVA, IVT, NEW**)
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Gurudhathan, K., et al. “Exploring the anti-cancer potential of methanolic extract from *Simarouba glauca*: Induction of apoptosis and growth inhibition in lung cancer cells.” *Oral Oncol. Rep*. 2023 Dec; 8: 100104. (**IVT, NEW**)

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Renal Cell Cancer:

Zhu, J., et al. “Ailanthone suppresses cell proliferation of renal cell carcinoma partially via inhibition of EZH2.” *Discov. Oncol*. 2024 Sep; 15(1): 464. (**IVT, NEW**)

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Reynertson, K., et al. “Induction of murine embryonic stem cell differentiation by medicinal plant extracts.” *Exp. Cell. Res.* 2011 Jan; 317(1): 82-93. (**IVT, INS**)

Diyabalanage, T., et al. "Nothospondin, a new AP-1 inhibitory quassinoid from the Cameroonian plant *Nothospondias staudtii*." *Bioorg. Med. Chem. Lett.* 2011 Aug; 21(15): 4397-9. (**IVT, NEW**)

Beutler, J., et al. “Quassinoid inhibition of AP-1 function does not correlate with cytotoxicity or protein synthesis inhibition.” *J. Nat. Prod*. 2009 Mar; 72(3): 503-6. (**IVT, INS, NEW**)

Morre, D., et al. "Mode of action of the anticancer quassinoids - Inhibition of the plasma membrane NADH oxidase." *Life Sci.* 1998; 63(7) :595-604. (**IVT, NEW**)

Used in combination with chemotherapy drugs:

Karthikeyan, S., et al. “Glaucarubinone sensitizes KB cells to paclitaxel by inhibiting ABC transporters via ROS-dependent and p53-mediated activation of apoptotic signaling pathways.” *Oncotarget*. 2016 Jul; 7(27): 42353-42373. (**INS**, **IVT, NEW**)

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Safety Studies:

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Osagie-Eweka, S., et al. “Toxicity status of methanol leaf extract of *Simarouba glauca* on rat liver.” *NISEB Journal.* 2019 Dec; 19(4): 192-203.
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Rivero-Cruz, J., et al. “Cytotoxic constituents of the twigs of *Simarouba glauca* collected from a plot in Southern Florida.” *Phytother. Res.* 2005; 19(2): 136-40.

Return to the Rain-Tree Tropical Plant Database File on Simarouba