

References on Anamu (*Petiveria alliacea*) 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**, **REV** 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 July 2025. To view research published after that time, follow these links to the National Institute of Health's National Library of Medicine on [anamu](#), [daucosterol](#), [dibenzyl trisulfide](#), [fluorapacin](#), and [myricetin](#)

Cancer Research on Anamu (*Petiveria alliacea*)

(Includes research on the plant and its identified anti-cancerous active chemicals)

Human Studies:

Ballesteros-Ramírez, R., et al. "Exploring the safety and efficacy of phytomedicine *Petiveria alliacea* extract (Esperanza) in patients with metastatic gastrointestinal tumors and acute leukemias: Study protocol for a phase IIb/randomized double blind phase II trial (PA001)." *BMC. Complement. Med. Ther.* 2023 Aug; 23(1): 284. (**HS**)

Review Articles:

Conceição, B., et al. "Amazonian plants: A global bibliometric approach to *Petiveria alliacea* L. pharmacological and toxicological properties." *Plants* (Basel). 2023 Sep; 12(18): 3343. (**REV**)

Felice, M., et al. "Molecular pathways involved in the anti-cancer activity of flavonols: A focus on myricetin and kaempferol." *Int. J. Mol. Sci.* 2022 Apr; 23(8): 4411. (**REV**)

Silva, J., et al. "Antimicrobial and anticancer potential of *Petiveria alliacea* L. (Herb to "Tame the Master"): A Review." *Pharmacogn. Rev.* 2018; 12: 85-93. (**REV**)

Küpeli Akkol, E., et al. "Coumarins and coumarin-related compounds in pharmacotherapy of cancer." *Cancers* (Basel). 2020 Jul; 12(7): 1959. (**REV**)

Sharma, A., et al. "Astilbin: a promising unexplored compound with multidimensional medicinal and health benefits." *Pharmacol. Res.* 2020 Aug; 158: 104894. (**REV**)

Williams, L., et al. "Life's immunity as a normal distribution function: philosophies for the use of dibenzyl trisulphide in immunity enhancement and life extension." *West Indian Med. J.* 2010 Oct; 59(5): 455. (**REV**)

Williams, L., et al. "Implications of dibenzyl trisulphide for disease treatment based on its mode of action." *West Indian Med. J.* 2009 Nov; 58(5): 407-9. (**REV**)

Williams, L., et al. "A critical review of the therapeutic potential of dibenzyl trisulphide isolated from *Petiveria alliacea* L. (guinea hen weed, anamu)." *West Indian Med. J.* 2007 Jan; 56(1): 17-21. **(REV)**

Test Tube Research on Multiple Cancer Cell Lines:

Ramirez, J., et al. "The secretome from human-derived mesenchymal stem cells augments the activity of antitumor plant extracts *in vitro*." *Histochem. Cell Biol.* 2024 May; 161(5): 409-421. **(IVT, INS, NEW)**

Lowe, H., "Specific RSK kinase inhibition by dibenzyl trisulfide and implication for therapeutic treatment of cancer." *Anticancer Res.* 2014 Apr; 34(4): 1637-41. **(IVT)**

Hernandez, M., et al. "[Evaluation of the antioxidant and cytotoxic activity of the ethanolic extracts of the leaves of *Annona muricata* L. (guanabana), *Calotropis gigantea* L. (algodon de seda) and *Petiveria alliacea* L. (anamú) in the Sabanalarga (Atlántico) municipality]." (Thesis) 2014. Universidad del Atlántico, Programa de Farmacia. Atlántico- Colombia. **(IVT)**

Muñoz, I. "[Evaluation of metabolic contents in cell cultures of *Petiveria alliacea* L. (anamú)]." (Thesis) 2011. Universidad Nacional de Colombia, Medellín -Colombia. **(IVT)**

Santander, S., et al. "[Influence of the treatment of *Petiveria alliacea* in the differential expression of genes in tumor cells]." *Univ. Med. Bogota* (Colombia). 2009 Jul-Sep; 50 (3): 284-296. **(IVT)**

Uruena, C., et al. "*Petiveria alliacea* extracts uses multiple mechanisms to inhibit growth of human and mouse tumoral cells." *BMC. Complement. Altern. Med.* 2008 Nov 18; 8: 60. **(IVT, NEW)**

Jovicevic, L., et al. "*In vitro* antiproliferative activity of *Petiveria alliacea* L. on several tumor cell lines." *Pharmacol. Res.* 1993; 27(1): 105-06. **(IVT)**

Rossi, V., et al. "Antiproliferative effects of *Petiveria alliacea* on several tumor cell lines." *Pharmacol. Res. Suppl.* 1990; 22(2): 434. **(IVT)**

Yan, R., et al. "Astilbin selectively facilitates the apoptosis of interleukin-2-dependent phytohemagglutinin-activated Jurkat cells." *Pharmacol. Res.* 2001; 44(2): 135-39. **(IVT)**

Weber, U., et al. "Antitumor activities of coumarin, 7-hydroxy-coumarin and its glucuronide in several human tumor cell lines." *Res. Commun. Mol. Pathol. Pharmacol.* 1998; 99(2): 193-206. **(IVT)**

Estevez, A., et al. "[Antitumor effect of a leaf decoction of *Petiveria alliacea* in animals]." *Rev. Cuba Farmacol.* 1976; 10: 81-4. **(IVT, IVA)**

Brain Cancer:

Williams, L., et al. "*In vitro* anti-proliferation/cytotoxic activity of sixty natural products on the human SH-SY5Y neuroblastoma cells with specific reference to dibenzyl trisulphide." *West Indian Med. J.* 2004 Sep; 53(4): 208-19. **(IVT)**

Rosner, H., et al. "Disassembly of microtubules and inhibition of neurite outgrowth, neuroblastoma cell proliferation, and MAP kinase tyrosine dephosphorylation by dibenzyl trisulphide." *Biochem. Biophys. Acta.* 2001; 1540(2): 166-77. **(IVT, NEW)**

Breast Cancer:

Carlosama, C., et al. "Triple negative breast cancer migration is modified by mitochondrial metabolism alteration induced by natural extracts of *C. spinosa* and *P. alliacea*." *Sci. Rep.* 2024 Aug; 14(1): 20253. **(IVT, NEW)**

Lasso, P., et al. "Natural products induce different anti-tumor immune responses in murine models of 4T1 mammary carcinoma and B16-F10 melanoma." *Int. J. Mol. Sci.* 2023 Nov; 24(23): 16698 **(IVT, NEW)**

Wooten, J., et al. "Dibenzyl trisulfide induces caspase-independent death and lysosomal membrane permeabilization of triple-negative breast cancer cells." *Fitoterapia*. 2022 Jul; 160: 105203. (IVT, NEW)
Hernandez, J., et al. "A cytotoxic *Petiveria alliacea* dry extract induces ATP depletion and decreases β -F1-ATPase expression in breast cancer cells and promotes survival in tumor-bearing mice." *Rev. Bras. Farmacog.* 2017 May-Jun; 27(3): 306-314. (IVT, IVA, NEW)
Hernandez, J., et al. "*Petiveria alliacea* standardized fraction induces breast adenocarcinoma cell death by modulating glycolytic metabolism." *J. Ethnopharmacol.* 2014 May; 153(3): 641-9. (IVT, IVA, NEW)

Colorectal Cancer:

Efe, E., et al. "Tubulin-binding anticancer polysulfides induce cell death via mitotic arrest and autophagic interference in colorectal cancer." *Cancer Lett.* 2017 Dec; 410: 139-157. (IVT, IVA, INS, NEW)

Gastric Cancer:

Ballesteros-Ramírez, R., et al. "Exploring the safety and efficacy of phytomedicine *Petiveria alliacea* extract (Esperanza) in patients with metastatic gastrointestinal tumors and acute leukemias: Study protocol for a phase IIb/randomized double blind phase II trial (PA001)." *BMC. Complement. Med. Ther.* 2023 Aug; 23(1): 284. (HS)

Head and Neck Cancers

Xu, L., et al. "[Dibenzyl trisulfide inhibits proliferation and induces apoptosis of HN30 cells via Akt/ p53 signaling pathway]." *Nan Fang Yi Ke Da Xue Xue Bao*. 2021 Jun; 41(6): 847-853. (IVT, NEW)

Leukemia:

Arévalo, C., et al. "Plant-derived extracts and metabolic modulation in leukemia: a promising approach to overcome treatment resistance." *Front. Mol. Biosci.* 2023 Jul; 10: 1229760. (INV, INS, NEW)
Murillo, N., et al. "*Petiveria alliacea* reduces tumor burden and metastasis and regulates the peripheral immune response in a murine myeloid leukemia model." *Int. J. Mol. Sci.* 2023 Aug; 24(16): 12972. (IVT, IVA, NEW)
Rojas, L., et al. "Effect of *Petiveria alliacea* extracts on metabolism of K562 myeloid leukemia cells". *Int. J. Mol. Sci.* 2023 Dec; 24(24): 17418. (IVT, INS, NEW)
Prada, L., et al. "Doxorubicin activity is modulated by traditional herbal extracts in a 2D and 3D multicellular sphere model of leukemia." *Pharmaceutics*. 2023; 15(6): 1690. (IVT, INS, NEW)
Ballesteros-Ramírez, R., et al. "Preferential activity of *Petiveria alliacea* extract on primary myeloid leukemic blast." *Evid. Based Complement. Altern. Med.* 2020; 2020: 4736206. (Ex Vivo)
Cifuentes, M., et al. "A fraction from *Petiveria alliacea* induces apoptosis via a mitochondria-dependent pathway and regulates HSP70 expression." *Univ. Sci.* 2009 May/Aug; 14(2-3): 125-134. (IVT, NEW)
Mata-Greenwood, E., et al. "Discovery of novel inducers of cellular differentiation using HL-60 promyelocytic cells." *Anticancer Res.* 2001; 21(3B): 1763-70. (IVT)

Liver Cancer:

Ruffa, M., et al. "Cytotoxic effect of Argentine medicinal plant extracts on human hepatocellular carcinoma cell line." *J. Ethnopharmacol.* 2002; 79(3): 335-39. (IVT)
Bassi, A., et al. "Comparative evaluation of cytotoxicity and metabolism of four aldehydes in two hepatoma cell lines." *Drug Chem. Toxicol.* 1997 Aug; 20(3): 173-87. (IVT)

Cancer Pathways:

- Srivastava, N., et al. "Caspase-3 activators as anticancer agents." *Curr. Protein Pept. Sci.* 2023; 24(10): 783-804. **(REV)**
- Ebenezer, O., et al, "A review of the recent developments of molecular hybrids targeting tubulin polymerization." *Int. J. Mol. Sci.* 2022 Apr; 23(7): 4001. **(REV)**
- Li, Q., et al. "Targeting the PI3K/AKT/mTOR and RAF/MEK/ERK pathways for cancer therapy." *Mol. Biomed.* 2022 Dec; 3(1): 47. **(REV)**
- Lopez, A., "Co-targeting of BAX and BCL-XL proteins broadly overcomes resistance to apoptosis in cancer." *Nat. Commun.* 2022 Mar; 13(1): 1199. **(REV)**
- Hernández Borrero, L., et al. "Tumor suppressor p53: Biology, signaling pathways, and therapeutic targeting." *Biochim. Biophys. Acta. Rev. Cancer.* 2021 Aug; 1876(1): 188556. **(REV)**
- Luo, Y., et al. "The significance of mitochondrial dysfunction in cancer." *Int. J. Mol. Sci.* 2020 Aug; 21(16): 5598. **(REV)**

Cancer Prevention:

- Wauchope, S., et al. "Dibenzyl trisulfide binds to and competitively inhibits the cytochrome P450 1A1 active site without impacting the expression of the aryl hydrocarbon receptor." *Toxicol. Appl. Pharmacol.* 2021 May; 419: 115502. **(IVT)**

Enhancing Chemotherapy Drug Effectiveness and/or Overcoming Drug Resistance:

- Corzo Parada, L., et al. "Activity is modulated by traditional herbal extracts in a 2D and 3D multicellular sphere model of leukemia." *Pharmaceutics.* 2023 Jun; 15(6): 1690. **(INS, NEW)**.

Cancer Drug Development:

- U.S. Patent # 8,734,863 B2: *Bioactive fraction of Petiveria alliacea. Pharmaceutical composition containing same and combination with immunostimulants for treating cancer.* May 27, 2014.
- Bao, Y., et al. "Stability studies of anticancer agent bis(4-fluorobenzyl)trisulfide and synthesis of related substances." *J. Pharm. Biomed. Anal.* 2008 Nov; 48(3): 664-71. **(IVT, NEW)**
- Bao Y, "Quantitative determination of anti-tumor agent bis(4-fluorobenzyl)trisulfide, fluorapacin and its pharmaceutical preparation by high-performance liquid chromatography." *J. Pharm. Biomed. Anal.* 2008 Jan; 46(1): 206-10. **(IVT)**
- Ochoa, A., et al. "[Preliminary standardization of quality parameters of the extract of the leaves of *Petiveria alliacea* L.]." *Rev. Cuba. Chem.* 2006; 18 (3): 78-83. **(IVT)**

Analogs and Derivatives of Anamu's Active Chemicals:

- Clarke, N., et al. "In silico design and SAR study of dibenzyl trisulfide analogues for improved CYP1A1 inhibition." *Chemistry. Open.* 2022 May; 11(5): e202200016. **(INS)**
- Gojon, G., et al. "Catenated divalent organic sulfur compounds as promising hydrogen sulfide prodrugs." *Antioxid. Redox. Signal.* 2020 Nov; 33(14): 1010-1045. **(IVT, INS, NEW)**
- An, H., et al. "Synthesis and anti-tumor evaluation of new trisulfide derivatives." *Bioorg. Med. Chem. Lett.* 2006 Sep; 16(18): 4826-9. **(IVT, INS, NEW)**

Anti-Inflammatory and Immune Modulation Studies:

Fatimah, N., et al. "An *in silico* study of the effects of chemical compounds in *Petiveria alliacea* leaf extract on inflammatory mediators." *Pharm. Edu.* 2024 May; 24(3): 153-158. **(INS)**

Olajubutu, O., et al. "Topical anti-inflammatory activity of *Petiveria alliacea*, chemical profiling and computational investigation of phytoconstituents identified from its active fraction." *Chem. Africa.* 2022 Mar; 5: 557–565. **(INS, IVT, NEW)**

Sathiyabalan, G. et al. "Antiinflammatory activity of whole plant of *Petiveria alliacea* L. (Phytolaccaceae)."

Int. J. Pharm. Sci. Rev. Res., 47(2), 2017 Nov-Dec; 22: 123-125.

Gutierrez, R., et al. "Anti-inflammatory potential of *Petiveria alliacea* on activated raw264.7 murine macrophages." *Pharmacogn Mag.* 2017 Jul; 13(Suppl 2): S174-S178.

Santander, S., et al. "Immunomodulatory effects of aqueous and organic fractions from *Petiveria alliacea* on human dendritic cells." *Am. J. Chin. Med.* 2012; 40(4): 833-44. **(IVT)**

Zaa C., et al. "[Anti-inflammatory and antioxidant effect of the hydroalcoholic extract of *Petiveria alliacea*]." *Rev. Peru Biol.* 2012; 19 (3): 329-334.

Williams, L. "Life's immunity as a normal distribution function: philosophies for the use of dibenzyl trisulphide in immunity enhancement and life extension." *West Indian Med. J.* 2010 Oct; 59(5): 455. **(REV, IVT)**

Santander, S., et al. "[Influence of the treatment of *Petiveria alliacea* in the differential expression of genes in tumor cells]." *Univ. Med. Bogota* (Colombia). 2009 Jul-Sep; 50 (3): 284-296. **(IVT, INS, NEW)**

Lemus, Z., et al. "[The anamú tablet: an immunostimulant herbal medicine]." *Medisan.* 2004; 8 (3): 57-64. **(IVT, IVA)**

Lopes-Martins, R., et al. "The anti-inflammatory and analgesic effects of a crude extract of *Petiveria alliacea* L. (Phytolaccaceae)." *Phytomedicine.* 2002; 9(3): 245-48. **(IVA)**

Queiroz, M., et al. "Cytokine profile and natural killer cell activity in *Listeria monocytogenes* infected mice treated orally with *Petiveria alliacea* extract." *Immunopharmacol. Immunotoxicol.* 2000 Aug; 22(3): 501-18. **(IVA)**

Quadros, M., et al. "*Petiveria alliacea* L. extract protects mice against *Listeria monocytogenes* infection--effects on bone marrow progenitor cells." *Immunopharmacol. Immunotoxicol.* 1999 Feb; 21(1): 109-24. **(IVA)**

Williams, L., et al. "Immunomodulatory activities of *Petiveria alliacea* L." *Phytother. Res.* 1997; 11(3): 251-253. **(IVT, IVA)**

Dunstan, C., et al. "Evaluation of some Samoan and Peruvian medicinal plants by prostaglandin biosynthesis and rat ear oedema assays." *J. Ethnopharmacol.* 1997 Jun; 57(1): 35-56. **(IVT, IVA)**

Germano, D., et al. "Pharmacological assay of *Petiveria alliacea*. Oral anti-inflammatory activity and gastrotoxicity of a hydro alcoholic root extract." *Fitoterapia.* 1993; 64(5): 459-467. **(IVT, IVA)**

Germano, D., et al. "Topical anti-inflammatory activity and toxicity of *Petiveria alliacea*." *Fitoterapia.* 1993; 64(5): 459-67. **(IVT, IVA)**

Drug Interaction Studies:

Murray, J., et al. "Significant inhibitory impact of dibenzyl trisulfide and extracts of *Petiveria alliacea* on the activities of major drug-metabolizing enzymes *in vitro*: An assessment of the potential for medicinal plant-drug interactions." *Fitoterapia*. 2016 Jun; 111: 138-46. (IVT)

Polyphenol Chemicals in Anamu with Anti-Cancer Actions:

The following polyphenols are mentioned in anamu research which researchers thought might be contributing to the plant's anti-cancer actions.

Astilbin: <https://pubmed.ncbi.nlm.nih.gov/?term=Astilbin+AND+Cancer>

Daucosterol: <https://pubmed.ncbi.nlm.nih.gov/?term=daucosterol+AND+Cancer>

Coumarin: <https://pubmed.ncbi.nlm.nih.gov/?term=coumarin++AND+cancer>

Engeletin: <https://pubmed.ncbi.nlm.nih.gov/?term=engeletin+AND+cancer>

Protocatechuic Acid: <https://pubmed.ncbi.nlm.nih.gov/?term=protocatechuic+AND+acid+AND+cancer>

Quercetin and Quercitrin:

<https://pubmed.ncbi.nlm.nih.gov/?term=quercitrin+OR+quercetin+AND+cancer&page=1>

Return to the Rain-Tree [Tropical Plant Database page on Anamu](#)

© Copyrighted 2025 by Leslie Taylor. All Rights Reserved.