

Anti-Angiogenic Cancer Drugs Include Cannabis, Ginger, Curcumin, Omega-3, Many Familiar Natural Substances

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By [MinnieApolis](#)

One of the more exciting avenues of research in cancer treatment is the use of antiangiogenic drugs. Antiangiogenesis attacks tumors by in effect, cutting off their blood supply. Tumors grow much faster than normal tissue, and so discouraging the growth of new blood vessels that fuel their growth tends to shrink the tumors or at least slow their growth.

What is Anti-Angiogenesis?

Angiogenesis is the formation of new blood vessels. While the body may need to repair damaged blood vessels or form new ones to replace clogged arteries, normally the body also has inhibitors to signal a stop to the process.

Angiogenesis is a key part of tumor growth and spread. New blood vessels convey nutrients to the cancer, fueling their abnormal growth and unchecked spread to other areas of the body.

Angiogenesis fuels the explosive growth and metastatic phase of cancers. It also means that the tumor can infiltrate the circulatory system and find new sites to invade (Angiogenesis Foundation, undated).

"The first successful treatment of an angiogenesis-dependent disease occurred in 1989, when the drug interferon alfa2a, an angiogenesis inhibitor, was used to regress the abnormal blood vessels growing in the lungs of a boy with a benign disease called pulmonary hemangiomatosis" (Angiogenesis Foundation, undated).

Tumors cannot grow or spread without the formation of new blood vessels, so researchers have begun studying 'antiangiogenic agents'. Advantages of this approach are that this class of drugs show only mild side effects and are not toxic to most healthy cells. Tumors do not seem to develop a resistance to these drugs, even when given over a long period of time. However, some complications could affect wound-healing, blood clotting, the immune system, and with reproduction (National Cancer Institute, undated).

Promising Antiangiogenic Compounds

While over 300 angiogenesis inhibitors have been discovered, only a handful have been formally studied. But with more than \$4 billion invested in the research and development of antiangiogenic medicines, something has to come of this massively-financed area of research. Over 10,000 cancer patients have already received some form of experimental antiangiogenic treatment.

Drugs and natural substances being researched in the U.S., Canada, Australia and for their

antiangiogenic properties include:

- Bevacizumab, for colorectal cancer, some lung cancers and metastasized breast cancer
- Cannabis (THC), for gliomas
- Curcumin
- Garlic
- Ginseng
- Green Tea Polyphenols
- Licorice
- Mushrooms and other fungi
- Omega-3 and Omega-6 fatty acids
- Quercetin
- Red Wine Polyphenols
- Shark Cartilage, as Neovastat by Aeterna Labs, Canada, for renal carcinoma, lung, prostate cancer
- Snake Venom
- Soy Beans
- Squalamine, by Genaera Labs, PA for some lung, ovarian cancers
- Tetrathiomolybdate copper (very high risk)
- Thalidomide, for gliomas
- Tree Bark
- Vitamin D3

Cancers Under Study

Cancers that have responded positively to Cannabis compounds in controlled studies (as well as macular degeneration) (Guzman, 2003):

- Breast Carcinoma
- Glioma or Glioblastoma
- Lung Carcinoma
- Lymphoma/Leukemia
- Neuroblastoma
- Prostate Carcinoma
- Skin Carcinoma
- Thyroid Epithelioma
- Uterus Carcinoma

Guzman lists possible mechanisms of cannabinoid action:

1. Induction of apoptosis (genetically programmed cell death, a normal body process), thru ceramide accumulation by de novo synthesis
2. Cell-cycle arrest, by inhibition of growth-factor-receptor signalling
3. Inhibition of angiogenesis, by inhibition of vascular-endothelial cell migration and survival?

Most sources recommend combining antiangiogenic drugs with traditional radiation or chemotherapy for a multi-pronged attack on a cancer. This is due to the sometimes disappointing results with some drugs that only stop the cancers from getting larger without reducing their size. But the most exciting suggestion is combining several natural substances. Each herb or other substance has slightly different antiangiogenic chemicals, so combining them into natural 'cocktails' would work on a greater variety of cancers.

Natural 'Cocktails'

According to Raymond Chang, M.D., medical director of Meridian Medical Group, New York, and clinical assistant professor of medicine at the Albert Einstein School of Medicine, N.Y., there are three main processes at work in angiogenesis: gene expression, enzyme activity and signal processing. Chang agrees that ultimately we will combine natural substances for take advantage of the synergistic effect of different phytochemicals.

I recommend looking up the paper for Current Oncology written by Sagar et al because it has charts for each of three types of promising compounds: one for natural health products with potential direct and indirect antiangiogenic activity, one for natural health products that inhibit COX-2 activity, and one of herbs that specifically inhibit vascular endothelial growth factor (such as the red wine and green tea mentioned by Oak et al).

For example, red wine and green tea polyphenols show a strong inhibitory action on vascular endothelial growth factor (VEGF) (Oak, 2005). Plus ginger root is showing abilities as a cell-cycle arrestor. One could easily drink red wine with one's ginger seasoned stir fry dinner, or a curry dish, for a moderate and digestible 'medicine'. I could drink to that.

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