

B-CARYOPHYLLENE AND CANCER

Beta-caryophyllene (BCP) is a major terpene of various plant essential oils reported for important pharmacological effects, including anticancer activity. It is extracted from several edible plant spices, such as black pepper, rosemary, and cinnamon. BCP is also a prominent component of hemp as well as being a phyto-cannabinoid itself because of its CB2R connection. The FDA has approved this substance as a flavor enhancer and in cosmetics. BCP is a safe, non-toxic, natural compound (E. Russo). Many investigations have established the potential utility of BCP in cancer therapies.

Here is a compilation of the many different mechanisms by which BCP helps treat cancer:

1. Induction of apoptosis by intracellular signaling, mitochondrial & DNA disruption
2. DNA protection and epigenetic changes for normal cells
3. Inhibition of angiogenesis, lympho-angiogenesis, migration, metastasis, pro-inflammatory mediators & nuclear receptors, pro-cancerous proteins
4. Concentrates chemo drugs, sensitizing, toxicity enhancing, and synergizing effects
5. Modulation of cancer receptors, enzymes, & transport molecules
6. Control of cancer cell cycles, inflammation, and glutathione levels
7. Regulation of gut/membrane permeability, metabolism, and microbiome
8. Modulation of oxidative stress, ROS, REDOX, autophagy and glutathione levels
9. Reduction of pain, anxiety, depression, sleep, & neurologic impairment
10. Partnering synergistically with CBD and other cannabinoids

BCP has been shown in preclinical studies and anecdotal cases to offer a broad range of chemo-preventive power by acting as gene-protective, cytoprotective, suppressive, and chemo-sensitizing agents. BCP also modulates intracellular processes affecting cancer proliferation and sensitivity to chemotherapy and radiotherapy including epigenetic DNA changes. BCP has demonstrated important pharmacological effects, including antioxidant, anti-inflammatory, heart protective, gastro-intestinal protective, kidney protective, antimicrobial, and immune-modulatory activity. BCP is exceptionally safe, has no significant drug interactions and can be immediately effective for many symptoms. BCP should play an important role in all aspects of oncology including prevention, adjunctive treatment, and symptom control as well as recurrence protection.

The most effective formulation is liposomal BCPLus® Endocannabinoid Activator because of its enhanced bioavailability and experience. A standard serving size is 1 mL twice a day with or without food. It is best taken sublingual for one minute before swallowing to get immediate and sustained benefits. And, also recommended is a full spectrum CBD product as essential for an active malignancy.

For local manifestations of pain use topical BCPLus® GEL. GEL is a formulated a BCP terpene blend in deanol, a soothing, and skin rejuvenator that delivers almost immediate pain relief, anti-inflammatory effect on joints, and skin healing. Because of its CB2 anticancer mechanisms BCPLUS Gel is likely an effective cancer treatment adjuvant.

References

- Russo. Taming THC: potential cannabis synergy and phytocannabinoid-terpenoid entourage effects. DOI:10.1111/j.1476-5381.2011.01238.x
- Fidyk et al. β -caryophyllene and β -caryophyllene oxide-natural compounds of anticancer and analgesic properties. 2016. doi: 10.1002/cam4.816.
- Dahham et al. The Anticancer, Antioxidant and Antimicrobial Properties of the Sesquiterpene BCP from the Essential Oil of *Aquilaria crassna*. 2015. doi:10.3390/molecules200711808
- Di Sotto et al. Chemopreventive Potential of Caryophyllane Sesquiterpenes. 2020. doi:10.3390/cancers12103034

B-CARYOPHYLLENE AND CANCER

Case Study 1

The patient is a 73 old divorced man who is in good health prior to experienced a epileptic seizure in July 2021. MRI and biopsy diagnosed a large glioma in his left brain. He underwent radiation therapy and began treatment with steroids, blood thinners and statins. He responded poorly to continued therapy both physically and cognitively. In Feb 2022 the glioma increased in size showing a midline shift of 1.0 cm and he suddenly became bedridden, could no longer walk and displayed loss of memory. At this time he was assigned to in-home hospice and continued to deteriorate. In June he started a full spectrum crude cannabis (THC>20%) and liposomal BCP (BCPLus®) whereupon he began making huge weekly strides of improvements mentally, physically, hair growth and bowel function. Clinically he has progressed to a normal neurologic and mental status exam despite a December MRI showed hyperintense signal involving the white matter with areas of encephalomalacia with chronic blood products. It did, however, note a decreased midline shift to 0.5cm. At this time he is full time employed as a sheriff's deputy department. He is fully engaged in strength training and brisk walking. His duties include being on his feet 8-10 hours per day. His sleep is solid and he is now feeling appropriate interest in a feminine relationship. Blair comment: Short of biopsy it is unclear about the current status of his glioma but because of his extraordinary physical, cognitive and performance recovery his tumor is in decline. This case emphasizes the metabolic and musculoskeletal benefits of BCP as well as a healthy libido enhancement.

Case Study 2

A 65 year old health plan executive man in good health had an elevated prostate specific antigen (PSA). Conservative management was recommended. He also has allergy symptoms and an elevated eye pressure consistent with early glaucoma. Therapy was begun with oral and vaporized CBD but PSA levels vasculated and biopsy was positive for cancer in several specimens. He continued with CBD and topical BCP but repeat and PSA showed the same. In March 2022 he started on liposomal BCP (BCPLus®) 30mg twice daily. Then in June an MRI showed one lesion 1.3 x 1.5 x 1.3 ml but biopsy was now negative for cancer in 12 specimens. Furthermore, his asthma is completely controlled with normal peak flows and his intraocular eye pressure is now low normal. Now he continues with maintenance dose of both CBD and BCP once per day.

Case Study 3

In 2019 a 79-year-old woman in good health was diagnosed with fist size estrogen positive breast cancer and placed on an aromatase inhibitors (letrozole) associated with severe arthralgia, fatigue, and osteoporosis. Despite the pain she continued on this therapy until March 2020 when she discontinued tapered and discontinued the drug. In March 2021 she admitted to discontinuing the drug and underwent an MRI to look for metastasis and lymph node involvement. Shortly after her MRI with contrast she suffered a stroke immobilizing her left side. The MRI did not show any metastasis or lymph node involvement but the lesion appeared to be enlarged in the left breast. At this time she began a full spectrum CBD product, resumed her aromatase inhibitor and engaged in stroke rehabilitation. In August 2021 she began liposomal BCP (BCPLus®) along with topical GEL and was able to discontinue all blood pressure medication and she had no further pain from the aromatase inhibitor. Her recovery from the stroke accelerated to independent self care. In addition her cognitive facilities recovered with normal interactions, humor, reading and computer tasks. The breast tumor has

B-CARYOPHYLLENE AND CANCER

shrunk and flattened with skin healing over the mass. In addition there is now ultrasound evidence of tumor disintegration with pain or enlarged lymph nodes. Blair comment: This woman experienced a complication due to the adverse effects of chemotherapy that has been completely rectified by BCP and CBD. In addition cannabinoid therapy facilitated her stroke recovery, cognitive function and pain control as well as preventing tumor extension and metastasis in combination with letrozole.