

study and found that CBD tremendously reduced the frequency and severity of chronic seizures while increasing the quality of life in humans with epilepsy. CBD is not only limited to the treatment of epilepsy but also shows efficacy for a wide array of different human disorders, ranging from cancer to chronic neuropathic pain, which reflects the broad spectrum of molecular targets. With the legalization of cannabis for medicinal purposes globally, an increase in pre-trials and clinical trials are anticipated and should facilitate exploration of the unknown therapeutic functions of phytocannabinoids.

**Keywords:** Cannabis, Cannabinoids, Cannabidiol, Epilepsy

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### CANNABINOID SYNTHESIS AND ACCUMULATION IN GLANDULAR TRICHOMES OF CANNABIS SATIVA

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Glandular trichomes are known to be the sites of cannabinoid accumulation in *Cannabis sativa*. They cover the surface of the aboveground plant parts but are most abundant on the floral bracts of pistillate plants. This study conducted to determine where the cannabinoids are synthesized and localized at the whole-plant level and at the cellular level using micromanipulation and transmission electron microscopy. According to their external features, three types of glandular trichomes are recognized: bulbous, capitate-sessile, and capitate-stalked trichomes. The gland head consist of disc cells containing cytoplasm and a non-cellular intrawall secretory cavity. The lipoplasts in the disc cells of globose heads synthesize lipophilic terpenes that migrate through the plasma membrane and into the cell wall adjacent to the secretory cavity. They subsequently pass through the cell wall and accumulate in the secretory cavity in the form of secretory vesicles. Numerous vesicles of different sizes and densities are localized in the secretory cavity. In conclusion, lipophilic terpenes and phenols, when released from their respective lipoplasts and vacuole compartments, accumulate in the plasma membrane/cell wall interface, where enzymes combine these precursors into cannabinoids. Mature glands possess the highest concentration of major cannabinoids, such as CBD in the fiber strains and THC in the drug strains of *Cannabis sativa*.

**Keywords:** Cannabis, cannabinoid, glandular trichome, lipoplast, secretory cavity, terpene

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### PRINCIPLE OF SAAM FIVE ELEMENT ACUPUNCTURE

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Saam five element acupuncture (SA) was developed by Saam Doin in the 17th century during Chosun Dynasty of Korea. It is often called as four-needle technique or five element acupuncture in other countries. The principle is originated from Nanjing (The classic of difficulties) Chapter 69. For example, if liver meridian is in deficiency, reinforce the water as mother to boost its child wood. Saam added reducing the metal as wood's controller to block metal's suppressing effect on wood. On the contrary, if liver meridian is in excess, reduce the child fire to consume wood energy by fire in the nourishing cycle. Saam added reinforcing the metal to strengthen metal's control over wood. In my opinion, there can be three ways to select the target treatment meridian; the pathway of meridian, five element theory, and six energy system. SA is a meridian-based approach using five element points. Its strength is a holistic and systematic balancing of organ functions rather than pure stimulation on the local lesion. It is a treasure of Korean acupuncture which needs to be inherited and developed for more active application to various disorders.

**Keywords:** Saam, Five Element, Acupuncture

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### A REVIEW OF CLINICAL RESEARCHES ON SAAM ACUPUNCTURE

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Saam acupuncture (SA) is a unique acupuncture treatment based on traditional Korean medical principles. The traditional theory about yin and yang, five elements, meridians are used in the application of SA. In particular, it uses the combination of five shu points for deficiency and excess of the meridians. After the diagnosis is made, the doctor principally selects four acupuncture points located below the elbow and knee joint and this makes SA an especially convenient and strong effective tool to patients. SA is a popular and safe treatment intervention widely applied in clinical practice to manage various conditions including musculoskeletal pain, mental disorder, and chronic, functional diseases. There are several previous studies related to SA for peripheral neuropathy, hwa-byung, amyotrophic Lateral Sclerosis, and so on. Pubmed and Korean databases were searched for clinical studies about SA treatment, and published articles related to SA and clinical trials, case studies are presented in this review.

**Keywords:** Saam acupuncture treatment, effect and safety, clinical evidence, review

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### EDITORIAL-IN-CHIEF MEETING OF JAMS, JOP, IMR AND JAR

Pan-Dong Ryu, South Korea: *Journal of Acupuncture and Meridian Studies(JAMS)*

Hyun-Min Yoon, South Korea: *Journal of Pharmacopuncture(JoP)*

Myeong Soo Lee, South Korea: *Integrative Medicine Research(IMR)*

Ho Sueb Song, South Korea: *Journal of Acupuncture Research(JAR)*

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### AN INTRODUCTION TO TAEGEUK ACUPUNCTURE

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Taegeuk acupuncture treatment which was suggested by Dr. Lee Byung-haeng for the first time in 1974, is based on Korean original Constitutional theory, Sasang Constitutional Medicine. In Dongeui-Susebowon, written by Dr. Lee Jema in 1894, he emphasized the function of heart by saying that heart is Taegeuk at the center among the five viscera organs and rules the other four organs. The name Taegeuk acupuncture was originated from the importance of heart as Taegeuk in Dr. Lee Jema's theory. Sasang Constitution means four types of constitution comprised of Tae-Yang, So-Yang, So-Eum and Tae-Eum. Tae-Yang has a characteristic of metal, So-Yang is fire, So-Eum is water, and Tae-Eum is wood. There are three main acupuncture points related to different characteristics and dominant organ functions of each constitution. One is among Heart meridian five shu points, and it is used for reinforcing method to restrain the dominant characteristic of each constitution. Another point is yuan-source (primary) point on the weak organ's meridian for reinforcement. The other is yuan-source (primary) point on the strong organ's meridian for reduction. For instance, in case of Tae-Yang, by reinforcing HT8 which has a characteristic of fire among heart meridian five shu points, we can reduce excessive metal-dominant characteristic of Tae-Yang. Since Tae-Yang has a decreased function of liver system, we choose LR3 for reinforcement, and LU9 for reduction of an excessive function of lung system. Therefore, the three main acupuncture points for Tae-Yang consist of HT8(+), LR3(+), and LU9(-). In a clinical practice, LI4, LI11 and ST36 are additionally chosen as representatives of acupoints on the upper and lower extremity. However, the treatment effects seem similar whether or not you choose the three additional points. Therefore, when you treat pediatric patients or patients who are afraid of needles, you can use only the three main points for the treatment. Its clinical applications are psychogenic diseases (e.g. anxiety, depressive mood disorder, Hwa-byung, sleep disorder, etc.), autonomic nerve system disorders, poor blood circulation, chronic pain syndrome (e.g. fibromyalgia), chronic fatigue syndrome, and so on. It can be an effective treatment measure for refractory conditions which show poor response to conventional treatments and other acupuncture techniques. This is because, Taegeuk acupuncture helps patients' own natural healing process by restoring the balance of the human body, regardless of the