

## #4

### “DSI for Dummies”

#### *Getting to know cannabinoid history*

We’ve all seen those “\_\_\_\_\_ for Dummies” books. They’re popular because they explain in detail complex subjects so that anyone can understand. That’s what we’re trying to do here, and with your ECS, we are going to help you overcome some of your federally imposed ignorance.

Of course, herbal cannabinoids have always been around. The scientific study of these substances began more than a hundred years ago. Beginning in 1896, some white-coats in Boston named Wood, Spivey, and Easterfield, isolated and named the first plant cannabinoid. Working with Indian hemp resin, also known as “charas,” the authors described a “physiologically active substance” which they named Cannabinol (CBN).

About four decades go by with no advancement in the science, but many changes in the law. The Marihuana Tax Act of 1937 effectively began federal cannabis prohibition. – But the science continued. In 1939, one of America’s leading organic chemists, Roger Adams, obtained a red oil extract made from Minnesota wild hemp supplied by the US Treasury Department. Adams, originally from Boston and a descendent of founder John Adams (VPOTUS 1 and POTUS 2), was working at the University of Illinois in Champaign-Urbana. He is credited with the 1940 isolation and identification of the second plant cannabinoid – Cannabidiol (CBD).

It was twenty-four years until the next major discovery. In 1964, while working at Hebrew University in Jerusalem, Raphael Mechoulam identified the compound *delta-9-Snuffleupagus* – which became widely known as THC.

The identification of three plant cannabinoids is only half the initial history; finding the receptors completes this phase. Up until this point, it was thought that cannabis worked like alcohol. This all changed in 1988. Entering the brains of rats, scientists attached radioactive tags to synthetic cannabinoids and watched where they landed. They made an amazing discovery! They found two types of cannabinoid receptors in the body and named them “CB1” and “CB2.” This discovery contrasts with alcohol, which has no receptors, is not part of a physiological system, and can easily induce alcohol poisoning.

Finding cannabinoid receptors in animals led scientists to an obvious question: what fits in them? This time they found the answer quickly. In 1992, the first endogenous cannabinoid was found by two scientists working in Mechoulam’s Jerusalem laboratory. They discovered “*anandamide*” and named it after the Sanskrit word for *bliss*.

This history lesson brings us to the present topic – DSI. Let’s break it down to its basics. DSI is an acronym for **D**epolarized-induced **S**uppression of **I**nhibition. This is

one of the ways cells talk back to each other. This form of communication is the chemical process called “retrograde signaling.” Imagine, like humans in conversation, cells have to let other cells know how things are going. Retrograde signaling filters and harmonizes this communication. It is when the receiving cell “talks back” and confirms to the sending cell that a message was received; the receiving cell also gives feedback on the original message. Think of this moment as a nod of understanding in a conversation, only at a cellular level.

In 2004, a *Scientific American* article titled “The Brain’s Own Marijuana,” put it this way – **“endogenous cannabinoids participate in retrograde signaling, a previously unknown form of communication in the brain.”** The phrase “previously unknown” explains a lot. That is why most Americans don’t know anything about DSI, retrograde signaling, or the ECS. We’ve all been unaware and uninformed to a degree; – not to mention the lack of any major media coverage in the United States in response to these breakthrough discoveries.

We’ve already covered some amazing topics in this book. First, we discussed the three types of cannabinoids: endogenous, herbal and synthetic. We explained the importance of the ECS in successful fertility and pregnancy. We talked about how cannabinoids play a key role in the modulation of temperature and heart rate when jogging.

The beginning of this essay was a fill in the “\_\_\_\_\_” moment about DSI. This previously unknown signaling system appears to be fundamental to the evolution of species.

Now, about that *DSI for Dummies* book ...

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### ***Search terms***

DSI, retrograde signaling and cannabinoids; charas and cannabiniol; Roger Adams and cannabidiol; Raphael Mechoulam, THC and anandamide; Sesame Streets’ Snuffleupagus; DSE and cannabinoids; POTUS 2 John Adams.

### ***Research and selected readings***

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