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The birth of the ECS

Which came first, the chicken or the egg?

A cell mutation occurred about 550 million years ago marking the emergence of animals with bones. This split also marks the birth of the ECS. A 2009 NY Academy of Sciences paper put it this way: *“Indeed the endocannabinoid system is a **very ancient signaling system**, being clearly present from the divergence of the protostomian/deuterostomian.”*

This divergence is the genetic marker between non-vertebrate and vertebrate species. Vertebrate reproduction is unimaginable without the **egg**. The proto/deutero split created cells that make eggs. Without this division there would be no chicken – which makes egg the answer.

Even though proof of the ECS exists in the fossil evidence, the Illinois General Assembly is still acting like a protostomian (spineless). I’m a veteran of the medical cannabis war in Illinois. I’ve seen how the system works: consciousness-raising, organizing, financing, testifying, debating, mediating and counting the final votes. All in the effort to show what seems obvious – that this is not just about cannabis. This battle has also demonstrated ***that the right to self-medicate is the same as the right to self-defense.***

Dr. Benjamin Rush was a founder of our country, colleague of George Washington, and namesake of Chicago’s Rush University Medical Center. As a revolutionary he advocated for the constitutional protection of medical freedom. He was blunt: *“Unless we put **Medical Freedom** into the Constitution, the time will come when medicine will organize into an undercover dictatorship.”*

Of course that sounds awful – “an undercover dictatorship.” The exact words “Medical Freedom” did not make it into our Constitution as Rush wanted. Nonetheless, the idea is there in concept and principle. The right to self-defense is a principle and it logically includes defending one’s health. Citizens empowered to recognize new information regarding their wellness and able to act accordingly – that sounds like a working definition for **medical freedom** to me.

More recently, Dennis Peron advocated for the 1996 citizen’s initiative allowing medical cannabis in California. Peron is credited with the bumper-sticker worthy quote *“All cannabis use is medical.”* His point accurately presents cannabinoids as therapeutic and points to the ECS’s role in biology and the development of vertebrate life.

If all use is medical, meaning that herbal ECS supplementation has wellness aspects, then we should find supporting evidence in the science of human reproduction – and we do. A 2002 research paper noted these facts concerning the ECS: *“**Cannabinoid***

receptors and/or AEA [anandamide] are present in mammalian reproductive organs including the testis, epididymis [sperm storage], prostate, ovary, uterus, sperm, preimplantation embryo and placenta, as well as prostatic and mammary carcinomas.”

Another study in 2002 found **anandamide** in the following “reproductive fluids”: human seminal plasma and mid-cycle oviductal and follicular fluids. And in case there is any doubt that the ECS plays a principal role in pregnancy, the same study reported: “**Sperm are sequentially exposed to these reproductive fluids as they move from the vagina to the site of fertilization.**”

Well? ... All the way to the site of fertilization ... that seems to be the moment of ... conception.

Clearly by 2002 the scientific community knew of a connection between the ECS and pregnancy. Jump to 2010 and the work of a British Endocannabinoid Research Group. These white-coats used “*a rapid, highly sensitive, specific and highly reproducible ultra-high-performance liquid chromatography-tandem mass spectrometry method*” for the analysis of compounds that support the ECS. They found anandamide and “**entourage compounds**” in human bio-fluids including plasma, serum, breast milk and amniotic fluids.

Entourage compounds create an “**entourage effect**” and support the ECS without (always) activating cannabinoid receptors. The entourage effect acts by modulating the metabolism of cannabinoids, preventing them from leaving the active system. These compounds have unfamiliar and not easily pronounceable names like **palmitoylethanolamide** (PEA) and **oleoylethanolamide** (OEA) – but you probably can’t get pregnant without them.

With its vital role in pregnancy established, it’s apparent that a malfunctioning or deficient ECS would be bad. ***Hyperemesis gravidarum (HG)*** is an apt example. Pregnancy involves some nausea and vomiting. With HG, these conditions become pernicious and life-threatening for mother and fetus. In *Women and cannabis: medicine, science, and sociology*, there are testimonials from HG diagnosed women who supplemented with herbal cannabinoids – stories of effectiveness in alleviating the pernicious nausea and vomiting. Hearing their words I realized they were only defending themselves and the life inside them. Now I saw them as individuals using cannabinoids in **self-defense** and **self-preservation** – defending and preserving life.

Testimonials aren’t policy. Most state and federal laws work to keep citizen’s from ECS supplementation – yet the scientific evidence points toward supplementation. Someone today seeking to become pregnant – how could they ignore the evidence? How can we?

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Search terms

ECS entourage compounds and effect; ECS and the protostomian/deuterostomian divergence; hyperemesis gravidarum; anandamide; N-acylethanolamides; Dr. Benjamin Rush; Dennis Peron.

Research and selected readings

2011: D Fraga, et al, *Cannabinoids inhibit migration of microglial-like cells to the HIV protein Tat*, *Neuroimmune Pharmacology*, 7 July 2011 [Epub].

2010: P Lam, et al, *Simultaneous measurement of three N-acylethanolamides in human bio-matrices using ultra performance lipid chromatography-tandem mass spectrometry*, *Analytical and Bioanalytical Chemistry*, November 2010:398(5):2089-97.

2010: A El Albini, et al, *Large colonial organisms with coordinated growth in oxygenated environments 2.1 Gyr ago*, *Nature*, July 2010:466(7302):100-4.

2010: J Jueckstock, et al, *Managing hyperemesis gravidarum: a multimodal challenge*, *BMC Medicine*, July 2010:15(8):46.

2010: A Taylor, et al, *Endocannabinoids and pregnancy*, *Clinica Chimica Acta: International Journal of Clinical Chemistry*, July 2010:411(13-14):921-30.

2010: E Raborn and G Cabral, *Cannabinoid inhibition of macrophage migration to the trans-activating (Tat) protein of HIV-1 is linked to the CB(2) cannabinoid receptor*, *Pharmacology and Experimental Therapeutics*, April 2010:333(1):319-27.

2009: P Grimaldi, et al, *The endocannabinoid system and pivotal role of the CB2 receptor in mouse spermatogenesis*, *Proceedings of the National Academy of Sciences USA*, July 2009:106(27):11131-6.

2009: S Fasano, et al, *The endocannabinoid system: an ancient signaling involved in the control of male fertility*, *NY Academy of Sciences*, April 2009:1163:112-24.

2008: T Stincic and R Hyson, *Localization of CB1 receptor mRNA in the brain of chicks (Gallus domesticus)*, *Brain Research*, December 2008:1245:61-73.

2008: M Maccarrone, *CB2 receptors in reproduction*, *British Journal of Pharmacology*, January 2008:153(2):189-98.

2006: M Maccarrone, et al, *Regulation by cannabinoid receptors of anandamide transport across the blood-brain barrier and through other endothelial cells*, *Thrombosis and Haemostasis*, January 2006:95(1):117-27.

2005: M Elphick and M Egertova, *The phylogenetic distribution and evolutionary origins of endocannabinoid signaling*, *Handbook of Experimental Pharmacology*, 2005:168:283-297.

2002: Edited by E Russo, et al, *Women and cannabis: medicine, science, and sociology*, Haworth Press: New York NY: co-published as the Journal of Cannabis Therapeutics, 2002:2(3-4).

2002: H Schuel, et al, *N-Acylethanolamines in human reproductive fluids*, Chemistry and Physics of Lipids, December 2002:121(1-2):211-27.

2001: M Elphick and M Egertova, *The neurobiology and evolution of cannabinoid signaling*, Philosophical Transactions of the Royal Society of London, March 2001:356(1407):381-408.