

The Lucky Gene

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We C.A.R.E. About Care

About Kris



Kris Mastrangelo, OTR/L, LNHA, MBA
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- Owns and operates
- **Harmony Healthcare International (HHI)**
- Nationally recognized, premier Healthcare Consulting firm specializing in **C.A.R.E.**

Compliance,
Audit and Analysis,
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Genetic Variation

- Scientists have demonstrated that a genetic variation in the brain makes some people **inherently less anxious**, and more able to **forget fearful** and unpleasant experiences

Genetic Variation

- In short, some people are prone to be less anxious simply because they won the genetic sweepstakes
- About **20% of adult Americans** have this **mutation**. Those who do may also be **less likely** to become **addicted** to marijuana and, possibly, other drugs.

Anandamide: Bliss Molecule

- Don't need the calming effects that marijuana provides
- This lucky genetic mutation produces higher levels of **anandamide** – the so-called bliss molecule and our own natural marijuana – in our brains

Case Study

- Patient XX
 - Depressed and lethargic
 - Cannabis
 - Daily for at least 15 years
 - Things are more interesting, and he can tolerate disappointments without getting too upset
 - Cognitively dulled by his chronic marijuana use

Case Studies (continued)

- Helping him control his anxiety
- **Stopped using cannabis**
- More alert, reactive and, **alas more anxious**
- Using cannabis to effectively quell his chronic anxiety

Anandamide: Bliss Molecule

- The **endocannabinoid system**, so named because the active drug in cannabis, **THC**, is **closely related to the brain's own anandamide**, is the target of marijuana and has long been implicated in anxiety

Anandamide: Bliss Molecule

- Anandamide is, aptly, taken from the Sanskrit word ananda, meaning bliss because, **when it binds to the cannabinoid receptor, it is a calming effect**

Anandamide: Bliss Molecule

- We all have anandamide, but those who have won the **lucky gene** have more of it because **they have less of an enzyme called FAAH**, which deactivates anandamide
- It is a **mutation in the FAAH gene** that leads to more of the bliss molecule anandamide bathing the brain

Effects of this “Mutation” (FAAH)

- People with the variant FAAH gene are **less anxious**
- Are thus **less inclined to like marijuana**
- They actually experience a **decrease in happiness** when smoking marijuana, compared with those with the normal FAAH gene, who find it pleasurable

Effects of this “Mutation”

- If you naturally have more of the real thing you understandably **have little use for marijuana**

Effects of this “Mutation”

- Lower anxiety and protection against cannabis dependence – and possibly to addition to some other drugs

Who Carries this “Mutation”?

- 21% of Americans of European descent,
- 14% of Han Chinese living in China
- and 45% of Yoruban Nigerians have been found to carry this gene variant

Drug Issues In U.S.

- **44% of Americans** age 12 and older report having used marijuana at some point during their lives, according to the National Institute on Drug Abuse

Effects of this “Mutation”

- Cannabinoid findings are a small part of the larger story that is not yet totally clear
- For example, there is evidence that a **genetic variation in the mu opioid receptor**, the target of morphine, OxyContin and other opiates, has a protective effect against **opiate addiction**

Further Brain Research

- Greater **connectivity** between the *prefrontal cortex, the executive control* center, and the amygdala, which is critical to processing fear, than the animals with the normal FAAH gene.
- A **stronger connection between these two brain regions** is known to predict lower anxiety and greater emotional control

Fear Extinction

- Those with this **cannabinoid mutation**, forget about previous dangers more easily and move around the world with less anxiety
- Learning more efficiently how to be **unafraid after dangerous situation**

Pharmacy Initiative

- These findings also suggest intriguing new **therapeutic targets** for drug abuse in general
- **Cannabinoid** circuit directly influences the dopamine reward pathway, which is the shared target of commonly abused **drugs, like cocaine, opiates and alcohol**

Pharmacy Initiative

- Thus, it is possible that a **medication that targets the endocannabinoid** system could be beneficial in treating addition to cannabis, and other drugs, too

Pharmacy Initiative

- What we really need is a drug that can **boost anandamide** – our bliss molecule – for those who are genetically disadvantaged

Nature Versus Nurture

- **Environment** plays a critical role and can sometimes even trump genetics
- For example, primates who are genetically at low risk for drug abuse can easily be converted to compulsive drug users just by exposing them to **cocaine or by putting them in crowded, stressful situations**

Nature Versus Nurture

- All walking around with a **random and totally unfair assortment of genetic variants** that make us more or less content, anxious, depressed or prone to use drugs

Long Term Effects

- Cannabis swamps and overpowers the brain's cannabinoid system, and there is evidence that chronic use may not just relieve anxiety **but interfere with learning and memory**

References

- New York Times, March 6th, 2015, Richard A. Friedman “The Feel-Good Gene”

Thank You

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