


 print this page

 close window

## The Brain Chemistry of the Buddha

In 'The God Gene,' geneticist Dean Hamer says human spirituality may have an innate genetic component to it.

Interview by Laura Sheahen

*Dean Hamer is a molecular biologist at the National Institutes of Health, where he heads the Gene Structure and Regulation section at the National Cancer Institute. In his latest book, Hamer says certain brain chemicals affect higher consciousness and spirituality, and that the actions of these chemicals are linked to a gene his team has researched. He spoke to us recently about "The God Gene: How Faith Is Hardwired into Our Genes."*

### What is the God gene?

The God gene refers to the idea that human spirituality has an innate genetic component to it. It doesn't mean that there's one gene that makes people believe in God, but it refers to the fact that humans inherit a predisposition to be spiritual—to reach out and look for a higher being.

### A big part of your research involved a "self-transcendence scale" to rate people's spirituality. What is this scale?

As you can imagine, it's not trivial to separate spirituality from more formal aspects of religion, but some psychologists like Robert Cloninger have tried to do that. They use a scale called "self-transcendence."

Overall, it tries to measure a sense of "at-oneness" with the universe independent of formal religious beliefs. More specifically, it actually looks at three different subscales. One of them is called self-forgetfulness: a measure of people's propensity to completely lose themselves in what they're doing, whether it's weeding the garden or meditating or whatever. People who are self-transcendent put less focus on themselves and more on everything outside of them. They see the connections to things.

A psychic component is called "transpersonal identification," a feeling of a sense of unity with everything else in the universe. Then there's a third scale called mysticism or spiritual acceptance which is more like, do you think mystical experiences have changed your life? Do you believe that science can't explain everything? Do you believe that there might be ESP, for example? Believing that there is more going on than meets the eye.

### So you studied a certain gene to see how it related to this self-transcendence scale?

Right. There was a twin study suggesting that this spirituality scale is at least partially inherited. We were interested in finding out what are the genes. So we did a classical type of study that molecular biologists do: we rounded up a bunch of people and measured their self-transcendence. Then we looked at a bunch of genes and looked for differences. And we found this one gene that was at least correlated with self-transcendence. It's called VMAT2, which stands for 'vesicular monoamine transporter no. 2.' It handles one type of brain chemical, monoamines, that have a lot to do with emotional sensitivity.

### What are some of these brain chemicals? Is serotonin a monoamine?

It is. A lot of people know about serotonin because that's depression, anxiety, feeling bad, etc. Although it's also ecstasy, feeling connected. With every brain chemical, like every personality trait, there's two sides. With depression and anxiety, the opposites are ecstasy, happiness, euphoria.

Norepinephrine is another one, although its functions are a little bit less defined. Dopamine is the third major one.

**So basically this VMAT2 gene, which you have been able to isolate, affects those brain chemicals—which in turn, you feel, affect people's sense of spirituality?**

Exactly. That's the theory. The best interpretation is that the monoamines are affecting higher consciousness. By higher consciousness, I mean the way that we perceive the world around us and our connection to it. We see all of these sites and sounds and smells and data coming in. We make it into sort of a coherent picture like 'that's a person', 'that's a building', etc. Furthermore, we're able to place ourselves precisely in that picture at all times. We know where we fit and we know that we're the same person that we were yesterday. We know that we'll be the same person tomorrow. There's never any discontinuity in who we are. We never think we're somebody else.

**Yet there are stories of holy people who do feel like their own personalities have evolved or changed.**

Exactly, changed. Or they feel like they're not on Earth anymore or they feel like they've reached Nirvana, if you're more of an Eastern type.

All of those are examples of people's consciousness changing, and I don't mean that in a flaky way. I mean it very particularly. Their relationship to the universe is somehow changed, and that's a very deep spiritual experience. I would say that every great religious leader had that type of experience.

Jesus went to the desert, Muhammad had all these flights, and Saul on the road to Damascus became Paul. Moses talked to the burning bush. Buddha spent a long time under a tree, contemplating. That's really the heart and soul of spirituality, changes in consciousness. Monoamines play a very important role in the brain, in connecting ourselves to the world around us.

**From a brain chemistry standpoint, what was happening in Jesus', Buddha's and Muhammad's brains during these spiritual experiences?**

I think that what happened in Buddha's brain is that by focusing really hard and concentrating the front part of his brain (the attention-orientation region) on his meditation, breathing, etc., that he sort of relaxed another part of the brain, probably a back part of the brain, and that there's a change in the flow of monoamines. And then his whole sense of orientation of himself relative to the universe just relaxed or changed. And bingo.

**So when we're "in the zone," in a Zen state where we forget about the self—that's the same thing you described with Buddha, but to a lesser extent, going on in our brains?**

Exactly. A very mild form of that. The monoamines, depending on the exact levels in your brain, probably make it a little easier or more difficult for that to occur also.

**Is there a way for people to increase their spirituality levels?**

Probably practice is the best. Even though we're saying there's a genetic predisposition, it's still very clear that practice makes perfect and that people can change their level of spirituality by working at it.

There's actually an experiment that I cited—I think it was by a graduate student in England, I'm not even sure if it's been published—but he or she actually gave the self-transcendence questionnaire to people with different levels of meditation experience, and showed that the self-transcendence scale changed as people meditated. Everything else about their

personality remained just the same.

**So just sitting down, praying or meditating or whatever, can actually change—**

The brain, yeah. I also think some people just have an easier time doing that than others. If you look at tennis players, some people are just going to be better tennis players than others, but nobody's a good tennis player unless they practice a lot.

**But in one part of your book, you talk about studies with identical twins and that also seems to bear out your ideas that there is some genetic basis, it's not just practice.**

Yes, the twin studies are really the original basis for saying self-transcendence is at least partially genetic. And what was interesting about it is not only is it partially genetic, but the part that is not genetic is not from social learning, it's not that people get this from their parents or even from their schools or their ministers or churches or anything else. It's just sort of genes and plus just the random stuff that happens in people's lives. The same type of twin studies have actually been used to look at more classic, formal religious beliefs like, do you believe the Bible is true? Do you think that abortion is a sin? And how often do you go to church? As you might expect, those type of beliefs and attitudes have really no genetic basis.

**Meaning they're very conditioned by the environment.**

Right.

**You're careful to say in the book that you don't want to speculate on whether God exists, this is purely about how the human brain functions when it's having spiritual experiences. Why?**

There's a natural tendency for believers to see this type of data as evidence that there is a higher power who made people in such a way that they would believe. But there's also a natural tendency for disbelievers to say, "This proves that it's all just in your mind."

I really can't overemphasize that this kind of data can't really support either of those views. It's purely about how the mind perceives things and works. Whether or not those beliefs are true, whether they come purely from within or whether they come from without, we just absolutely can't say. I don't think people should use this type of information in that way.

**What do you hope people take away from the book?**

One is that this idea of being "spiritual without being religious" gets clichéd a lot, but it's true. They really are different aspects of human personality.

Spirituality is a great thing. It gives people a connection to others and to the world around them; it's a wonderful talent of human beings that can enrich our life.

But when it comes to religion, to me the important thing is that it's not anything innate about humans. A lot of religious ideas aren't here because they're good for us—and probably they're not here because that's what God believed.

They're just here because they're ideas that replicate themselves easily. So they too can be changed: ideas like 'my religion is the only religion,' 'your religion is bad and you should die for it,' 'I'm going to heaven and you're going to hell,' 'we should have a war because we don't like your religion,' etc. They're terrible ideas. They are very powerful but they're not unchangeable. So that's my long lesson one.

Lesson two is that I hope this book will make religion a little bit more respectable in academic

circles. It used to be that academics was all about religion. Then, especially after World War II, religion became very unpopular in academic circles. It became very flaky to talk about religion at all, except in a religion department.

But in fact, it's a very important part of people's lives. It's a lot more important to most people than evolution or nuclear physics or anything like that. People spend a lot of time on religion and praying and believing and it affects everything. I just hope that this sort of helps to reopen the the academic-scholarly scientific study of religion. It's a very important part of our lives.