This Is Your Brain On Music

Whether you are rocking out to Macklernome Ryan Lewis in your car or reading with Bach in your bedroom, music has a special ability to pump us up or calm us down.

Scientists are still trying to figure out what’s going on in our brains when we listen to music and how it produces such potent effects on the psyche.

We’re using music to better understand brain function in general.

Three studies published this month explore how the brain responds to music. The quest to dissect exactly what chemical processes occur when we put our headphones is far from over, but scientists have come across some clues.

Listening to music feels good, but can that translate into physiological benefits? A meta-analysis of 400 studies in the journal suggested that the answer is yes.

In one study reviewed, researchers studied patients who were to undergo surgery. Participants were randomly assigned to either listen to music or take anti-anxiety drugs. Scientists tracked patient’s ratings of their own anxiety drugs, as well as the levels of the stress hormone cortisol.

The results: The patients who listened to music had less anxiety and lower cortisol than people who took drugs. This points toward a powerful medicinal use for music.

The promise here is that music is arguably less expressive than drugs, and it’s easier on the body and it doesn’t have side effects.

Highlighted evidence showed that music is associated with immunoglobin A, an antibody linked to immunity, as well as higher counts of cells that fight germs and bacteria.
What music we like

So music is good for us, but how do we judge what music is pleasurable? A study published in the journal Science suggests that patterns of the brain activity can indicate whether a person likes what he or she is hearing.

The study authors highlights in their results a brain area call the nucleus accumbens, which is involved in forming expectations.

There is actually a network of activity that predicts whether or not you’re going to buy music as you’re listening to the music.

The more activity in the nucleus accumbens, the more money people said they were willing to spend on any particular song in the “auction” set-up that the researchers designed.

This was an indicator that some sort of reward-related expectations were met or surpassed.

Another brain area called the superior temporal gyrus is intimately involved in the experience of music, and its connection to the nucleus accumbens is important. The genres of music that a person listens to over a lifetime impact how the superior temporal gyrus is formed.

The superior temporal gyrus alone doesn’t predict whether a person likes a given piece of music, but it’s involved in storing templates from what you’ve heard before. For instance, a person who has heard a lot of jazz before is more likely to appreciate a given piece of jazz music than someone with a lot less experience.

Are we all hearing the same thing?

It seems intuitive that different people, based on their personalities, preferences and personal histories of listening to particular music, will have different experiences when exposed to a particular piece of music. Their attention to various details will vary and they might like different things about it.

Despite our idiosyncrasies in listening, the brain experience music in a very consistent fashion across subjects.
Seventeen participants who had little or no music training took part in this study which, is small, but typical for an IMRI study. Participants listened to four symphonies by composer William Boyce of the late Baroque period, which the researchers chose because they reflect western music but were likely to be unfamiliar to subjects.

Among participants, the researchers found synchronization in several key brain areas, and similar brain activity patterns in different people who listen to the same music. This suggests that the participants not only perceive the music the same, but despite whatever personal differences they brought to the table, there’s a level on which they share a common experience.

Brain regions involved in movement, attention, planning and memory consistently showed activation when participants listened to music—these are structures that don’t have to do with auditory processing itself. This means that when we experience music, a lot of other things are going on beyond merely processing sound.

One resulting theory is that these brain areas are involved in holding particular parts of a song, such as the melody, in the mind while the rest of the piece of music plays on.

The results also reflect the power of music to unite people.

It’s not our natural tendency to thrust ourselves into a crowd of 20,000 people, but for a Muse concert or a Radiohead concert we’ll do it. There’s this unifying force that comes from music, and we don’t get that from other things.

Further, researchers might compare how individuals with healthy brains differ in their musical listening compared to people with autism or other brain disorders.

**What’s next?**

The next frontier in the neuroscience of music is to look more carefully at which chemicals in the brain are involved in music listening and performing and in which parts of the brain they are active.

Any given neurochemical can have different function depending on its area of the brain. For instance, dopamine helps increase attention in the frontal lobes, but in the limbic system it is associated with pleasure.
By using music as a window into the function of a healthy brain, researchers may gain insight into a slew of neurological and psychiatric problems.

Knowing better how the brain is organized, how it functions, what chemical messengers are working and how they’re working—that will allow us to formulate treatments for people with brain injury, or to combat diseases or disorders or even psychiatric problems.


Zika Virus: 5 Things You Need To Know

A health worker fumigates an area in Caracas, Venezuela to combat the Aedes aegypti mosquito February 2. The mosquito carries the Zika virus, which has suspected links to birth defects in newborns. The World Health Organization expects the Zika outbreak to spread to almost every country in the America.

A mosquito-borne virus is prompting worldwide concern because of an alarming connection to a neurological birth disorder and its rapid spread across the globe.

World Health Organization Director-General Margaret Chan called it an “extraordinary event” in declaring a public health emergency.

The Zika virus transmitted by the aggressive Aedes aegypti mosquito, has spread to at least 29 countries. WHO estimates 3 million to 4 million people across the Americas will be infected with the virus in the next year. The Center for Disease Control and Prevention is warning pregnant women against travel to those areas; health officials in several of those countries are telling women to avoid pregnancy – in some cases for up to two years.

As long as the mosquito keeps reproducing, each and every one of us is losing the battle against the mosquito.

The U.S. Defense Department is offering voluntary relocation to pregnant employees and their beneficiaries who are stationed in affected areas.

That’s a pandemic in progress, “said Dr. Anthony Fauci, director of the National Institute of Allergy and Infectious Diseases at the National Institutes of Health. “It isn’t as if it’s turning around and dying out: it’s getting worse and worse as the days go by.
What is Zika and why is it so serious?

The Zika virus is a flavivirus, part of the same family as yellow fever, West Nile, Chikungunya and dengue. But unlike some of those viruses there is no vaccine to prevent Zika or medicine to treat the infection.

Zika is commanding attention because of an alarming connection between the virus and microcephaly, a neurological disorder that results in babies being born with abnormally small heads. It causes severe developmental issues and sometimes death. Since November, Brazil has seen more 404 confirmed cases of microcephaly in newborns. Seventeen of those cases have a confirmed link to the Zika virus. There were only 146 cases in 2014. So far, 15 babies have died from the condition, with five linked to Zika. An additional 56 deaths are under investigation, and authorities are investigating 3,670 suspected cases. Other Latin American countries are seeing cases in newborns as well, Colombia reported more than 2,000 pregnant women have tested positive for the virus, while in the united states one Hawaiian baby was born with microcephaly linked to the Zika virus after his mother returned to Brazil. Several states have confirmed the virus in individuals who traveled to areas where the virus is circulating, including Illinois, where health officials are monitoring two infected pregnant women.

The CDC is asking OB-GYNs to review fetal ultrasounds and do maternal testing for any pregnant women who has traveled to one of the 29 countries where Zika is active.

The agency advises health care providers offer testing for the virus to pregnant women who have to those areas within two to 12 weeks after returning home.

Providers should screen pregnant women with symptoms of the virus while they are experiencing illness and should test pregnant women without symptoms at the start of their prenatal care and run a subsequent test in the middle of the second trimester, the CDC said. Providers may want to consider an additional ultrasound beyond the routine second trimester ultra, the agency said.
In most people, symptoms of the virus are mild, including fever, headache, rash and possible pink eye. In fact 80% of those infected never know they have the disease. That’s especially concerning for pregnant women, as the virus has now been shown to pass through amniotic fluid to the growing baby.

**How is Zika spread?**

The virus is most commonly transmitted when an Aedes mosquito bites a person with an active infection and spreads the virus by biting others. Those people become carriers when they have symptoms.

The CDC reported the first case of locally acquired Zika virus in the United States in the latest outbreak, but it was not from a mosquito bite. Instead it was passed via sex.

The case, which Dallas County, Texas health officials announced, involved a patient who had sex with someone who had recently returned from Venezuela infected with the mosquito-borne virus. The patient had not traveled.

The CDC stressed no danger faced the developing fetus in the Texas case and said it planned to provide guidance on sexual transmission with a “focus on the male sexual partners of women who are or who may be pregnant.”

Previously, there had been only two documented cases linking Zika to sex. During 2013 outbreak in French Polynesia, semen and urine samples from a 44-year old Tahitian man tested positive for Zika even when blood sample did not.

The CDC said there have been documented cases of virus transmission during labor, blood transfusion and laboratory exposure. While Zika has been found in breast milk, it’s not yet confirmed it can be passed to a baby through nursing.

For women of childbearing age, the CDC now recommends discussing, “Strategies to prevent unintended including counseling on family planning and the correct and consistent use of effective contraceptive methods in the context of the potential risks of Zika virus transmission with patients.

The CDC also called our local health officials to implement routine testing recommendations for pregnant women with or without symptoms based on local transmission of the virus and their capacity to process them.
Where is the Zika virus now?

The Zika virus is now being locally transmitted in Barbados, Bolivia, Brazil, Cape Verde, Colombia, Costa Rica, Curacao, Dominican Republic, Ecuador, El Salvador, French Guiana, Guadeloupe, Guatemala, Guyana, Haiti, Honduras, Jamaica, Martinique, Mexico, Nicaragua, Panama, Paraguay, Puerto Rico, St. Martin, Suriname, Samoa, Tonga, the U.S. Virgin Islands and Venezuela, according to the CDC and WHO.

Zika has arrived in the United States from travelers returning from these infected areas and, in one case, through sexual transmission. The concern, of course, is whether imported cases could result in more locally transmitted cases within the United States.

The Aedes albopictus, or Asian tiger mosquito, which along with Aedes aegypti transmits Zika virus, is present in many parts of the United States.

If mosquitoes in the United States do become carriers, a model created by Toronto researchers found more than 63% of the U.S. population lives in areas where Zika virus might spread during seasonally warm months. A little more than 7% of Americans live in areas where the cold might not kill off the mosquito in the winter, leaving them vulnerable year-round.

What can you do to protect yourself against Zika?

With no treatment or vaccine available, the only protection against Zika is to avoid travel to areas with an active infestation. If you do travel to a country where Zika is present, the CDC advises strict adherence to mosquito protection measures: Use an EPA-approved repellent over sunscreen, wear long pants and long-sleeve shirts thick enough to block a mosquito bite, and sleep in air-conditioned, screened rooms, among others.

If you have Zika, you can keep from spreading it to others by avoiding mosquito bites during the first week of illness, the CDC said. The female Aedes aegypti, the primary carrier of Zika, is an aggressive biter, preferring daytime to dusk and indoors to outdoors. Keeping screens on windows and doors is critical to preventing entry to homes and hotel rooms.

http://www.cnn/2016/01/26health/zika-waht-you-need-to-know
How to Protect Yourself

The Zika virus is spread when a mosquito bites an infected person, then bites an uninfected person and passes the virus. Most infected people don’t show symptoms. But the virus is suspected of causing microcephaly in babies of infected pregnant women, although a cause-and-effect link hasn’t been definitely established. Microcephaly causes devastating, sometimes-fatal brain damage and can result in miscarriage or stillbirth.

The CDC has warned women who are pregnant or may become pregnant to consider postponing travel to more than 25 countries and territories in Central and South America, and the Caribbean.

In Brazil, the situation is so desperate that they’re trying an experiment: releasing genetically engineered male mosquitoes into the wild. When they breed with females, they pass a self-destruct gene to their offspring that causes them to die before they reach adulthood. Oxitec, the British company that produces that mosquito, claims in tests that it cut wild Aedes populations by as much as 90%.

The company says it has been in talks with the FDA to test its mosquitoes in the Florida Keys, but hasn’t yet received approval to try it here. Supporters say the Oxitec mosquito could end the menace of Zika and other mosquito-borne viruses without the toxic after-effects of pesticides. But critics worry about the unintended consequences of releasing a genetically modified insect into the wild.

While we wait to see if science can save us, warm, wet weather is on the way.

Specialists say the first Aedes mosquitoes will hatch in an area after the temperature has been above 50 degrees for at least 16 days.

To protect yourself, experts agree that the most important thing to do is to get rid of standing water in and around your house. But the mosquitoes aren’t always where you might think.
Here is a list of suggestions to reduce the Zika’s virus:

1. Empty buckets or watering cans. If you have a rain barrel, treat it with a non-toxic product designed to kill mosquito larvae.

2. Drill holes in your trash or recycling bins so they don’t collect water.

3. Even though it’s a pain to disconnect them, unscrew and empty downspout extenders at least once every 5 days. That’s how long it takes mosquito eggs to hatch.

4. If you’ve got plants in containers, empty their drip trays at least once a week. Same goes for outdoor-furniture covers that may hold pockets of water after a rainstorm.

5. Try to cover any outdoor equipment, like a barbecue grill, so it doesn’t collect water in places you can’t see or reach.

6. Aedes mosquitoes like to bite below the knees, so long pants and socks are important. Wear long sleeves as well.

7. Use a mosquito repellent DEET or a slightly less sticky, greasy alternative called picaridin both work well.

Since mosquitoes don’t do well in wind, a draft helps set up a mechanical barrier, and it also helps blow away all the human odors that cue them to your warm-blooded presence.