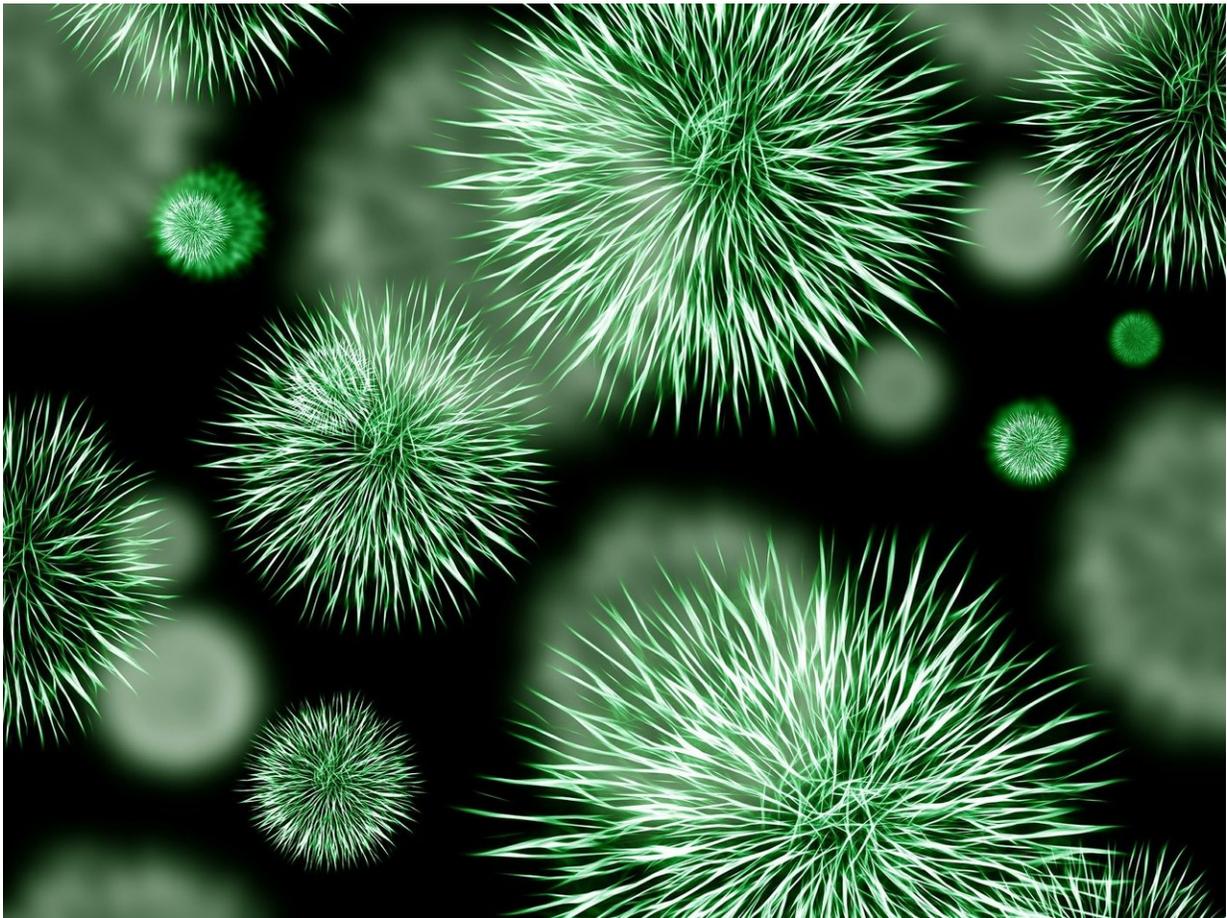


Best of Last Year: The top MedicalXpress articles of 2019

December 13 2019, by Bob Yirka



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It was another good year for medical innovation as [a trio of researchers](#)

[won the Nobel Prize in Physiology or Medicine for work on how cells adapt to oxygen](#). Americans William Kaelin and Gregg Semenza, and Britain Peter Ratcliffe split the 9 million Swedish kronor they won for their study of the function of the EPO gene and its involvement in a low-oxygen-sensing mechanism, opening up new strategies to fight such diseases as cancer and anemia.

And a team at the University of Manchester found that [a sex drug was 'effective' as a heart failure treatment](#). They found that the drug Tadalafil, normally used for erectile dysfunction, reduced heart failure rates in sheep and suggested that the same will likely be true for humans. They noted that some patients already taking the drug for erectile dysfunction were likely already seeing the heart benefits.

Also, a group of researchers at the U.S. Food and Drug Administration announced that [newer diabetes drugs are linked to a 'flesh-eating' genital infection](#). They discovered that people taking SGLT2 inhibitors were slightly more susceptible to Fournier gangrene, an infection that attacks the genitals or anus and kills the tissue. Because of its rarity, there are no plans to discontinue the drug.

And last March, *The Lancet* published a report claiming that [high-potency marijuana could be 'strongly linked' to psychosis](#). The team behind the report claimed that marijuana with high levels of THC was a clear factor in several [mental health disorders](#) and that it could sometimes lead to psychosis in users. The researchers also noted that such incidents are becoming more common as more countries loosen marijuana usage laws.

Also, a group at the University of Sydney found evidence that high-protein diets could lead to a reduced lifespan, weight gain and a negative impact on mood. They acknowledged that excessive consumption of branched-chain amino acids could deliver on promises of an increase in

muscle, but suggest its drawbacks might outweigh its benefits. They further suggested that [people put down the protein shake and instead seek a variety of protein sources for better for health.](#)

And a team at Arizona State University reported that [autism symptoms were reduced nearly 50 percent two years after a fecal transplant.](#) The research was based on a theory that autism might be related to conditions in the [gut microbiome.](#) Transplanting a healthy microbiome into someone with autism, the team suggested, could lead to reduced symptoms.

Also, a team at the University of California, Berkeley, found that [with a single gene insertion, blind mice could regain their sight.](#) The gene insertion was done with a mouse model experiencing retinal degeneration due to induced genetic problems. A programmed virus was injected into retinal ganglion cells making them regain their sensitivity to light.

And in a study led by a team at the University of Exeter, researchers found [that two hours a week is a key dose of nature for health and wellbeing.](#) They found that people who spend at least two hours a week in a natural outdoor environment reported being healthier and exhibited higher psychological well-being than did those who did not venture outdoors on a regular basis. They noted that the threshold was 120 minutes, and it did not matter if it was across small spans of time or all at once.

The FDA approved [a \\$2M medicine,](#) the most expensive ever marketed. The medicine is called Zolgensma and is prescribed for spinal muscular atrophy, a rare disorder that destroys a baby's muscle control and kills nearly all of those with the most common type of the disease within a couple of years. The actual price for treatment was listed as \$2.125 million—out-of-pocket costs for patients were expected to vary based on

insurance coverage.

And a team at Vanderbilt University found that [women's hormones play a role in drug addiction and higher relapse rates](#). In their study with rats, they found that females were more willing to "pay" more in the presence of triggers to get a dose of cocaine when their hormone levels were higher. They also made stronger associations with a trigger and were more likely to keep pushing a lever to get any amount of cocaine.

Also, a team at the University of Pennsylvania found [a link between the onset of dementia and a hormone-blocking prostate cancer treatment](#). In studying a health database with 154,000 older patients, the researchers found 13 percent of them who were given the treatment developed Alzheimer's, as compared to just 9 percent for patients who did not receive the treatment. They suggest that finding such a connection in such a large database was significant.

And a team with members from Flinders, SAHMRI, and McMaster University in Canada discovered [how gut bacteria negatively influence blood sugar levels](#). They reported that the microbiome can worsen metabolism by signaling to cells in the gut that produce serotonin. They noted that such signals could drive up serotonin levels, which was previously shown to be the case in obese people, and the rise in blood serotonin caused significant metabolic problems.

An international team of researchers working at University Hospital Zurich found that [broken heart syndrome could be linked with cancer](#). They found that of 1,604 patients with broken heart syndrome in the International Takotsubo Registry, 267 patients, or one in six (average age 69.5 years and 87.6 percent female) had cancer. Those that developed cancer were also more likely to have experienced an emotional trigger for the syndrome.

And a team at Marshall University [tied walnuts to a gene expression related to breast cancer](#). They found that consumption of two ounces of walnuts a day for about two weeks significantly changed gene expression in confirmed breast cancers—and that consumption of walnuts slowed breast cancer growth and/or reduced the risk of mammary cancer in mice.

A study led by the Silent Spring Institute in collaboration with the Public Health Institute found that [dental flossing and other behaviors could be linked with higher levels of toxic chemicals in the body](#). They measured 11 different PFAS chemicals in blood samples taken from 178 middle-aged women enrolled in the Public Health Institute's Child Health and Development Studies, and by comparing chemical blood levels with behaviors, were able to find links between the two.

An international team of researchers studying progress in nanotechnology, nanomedicine, AI and computation found evidence that [a future 'human brain/cloud interface' will give people instant access to vast knowledge via thought alone](#)—they predict the development of neural nanorobots that could serve as a relay between the neocortex and a "synthetic neocortex" in the cloud.

A team at the Australian National University announced [a groundbreaking genetic discovery that showed why Lupus develops](#). They reported that they were able to show, for the first time, how rare gene variants that occur in less than 1 percent of the population can lead to lupus, and how those variants drive the disease in the body.

And in another study carried out by a team at the University of California, the researchers found that [smoking electronic cigarettes can damage brain stem cells](#). Using cultured mouse neural stem cells, the researchers identified the mechanism underlying EC-induced stem cell toxicity as "stress-induced mitochondrial hyperfusion," or SIMH.

A team with members from Curtin University and the Australian National University found evidence that [red meat as part of a healthy diet could be linked to a reduced risk of multiple sclerosis](#). In studying data on 840 Australians as part of an effort to better understand the risks or benefits of the Mediterranean diet, the researchers found a link between the diet and a reduced risk of a first episode of CNS demyelination, a common precursor to MS.

And a team led by a group at MIT developed [a capsule that releases insulin in the stomach as a possible replacement for injections for patients with type 2 diabetes](#). Approximately the size of a blueberry, each capsule contained a small needle made of compressed insulin, which was injected after the capsule reached the stomach.

Also, EPFL, a spin-off called Amazentis, and the Swiss Institute of Bioinformatics announced that [a pomegranate compound with anti-aging effects has passed human trials](#). The compound contained Urolithin A, which is a metabolite of biomolecules found in pomegranates and other fruits. Officials claimed that the compound slowed down skeletal muscle strength loss typically associated with aging by 50 percent.

And a team at South Australian Health & Medical Research Institute carried out a study that [showed why high-protein diets are unhealthy](#). In their study using worms and fruit flies, they were able to see how diet influenced the speed of protein synthesis—and how speeding up protein synthesis tended to produce more errors that lead to shorter lifespans.

Also, a team at Johns Hopkins University School of Medicine reported that [Parkinson's disease has origins in the gut](#). In their experiments with mice, the team found evidence of Parkinson's disease originating among cells in the gut and traveling up the body's neurons to the brain. More specifically, they found misfolded alpha-synuclein being transmitted from the gut to the brain in mice along the vagus nerve.

And a team led by a group at Michigan Medicine found [a 'mystical' psychedelic compound in normal brains](#). A molecule called dimethyltryptamine is typically associated with a brewed concoction made from the vine plant *Banisteriopsis caapi* that produces hallucinogenic episodes. The team at UM found that it exists naturally in the mammalian brain.

And finally, a team led by a group at the University of Buffalo found [that it may be possible to restore memory function in people with Alzheimer's disease](#). They report that by focusing on epigenetic changes, it was possible to reverse memory decline in an animal model of AD—and they also identified the epigenetic factors that contribute to memory loss from the disease.

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