



HEALTH

Mind-Altering Cat Parasite Just Got Linked to a Whole Lot of Neurological Disorders

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The brain-dwelling parasite *Toxoplasma gondii* is estimated to be hosted by at least 2 billion people around the world, and new evidence suggests the lodger could be more dangerous than we think.

While the protozoan invader poses the greatest risk to developing foetuses infected in the womb, new research suggests the parasite could alter and amplify a range of neurological disorders, including epilepsy, [Alzheimer's](#), and [Parkinson's](#), and also [cancer](#).

"This study is a paradigm shifter," [says one of the team](#), neuroscientist Dennis Steindler from Tufts University.

"We now have to insert infectious disease into the equation of neurodegenerative diseases, epilepsy, and neural cancers."

The findings are part of an emerging field of research looking into how *T. gondii*, which is usually transmitted to humans via contact with cat faeces (or by eating uncooked meat), [produces proteins](#) that alter and manipulate the brain chemistry of their infected hosts.

While healthy adults are generally considered not at risk from the parasite – with the exception of pregnant women, who are advised to stay well clear of cat litter – the organism has previously been tied to [behaviour-altering disorders](#), and evidence suggests it can also [rewire how our immune system functions](#).

Other research has been [doubtful](#) of some of the claims around the parasite, suggesting *T. gondii*'s correlations to neurological conditions aren't quite as established as some reports would have you think.

In the new study, though, a team of more than 30 researchers from 16 institutions assessed how *T. gondii*'s secreted proteins could impact the neural chemistry of human hosts, triggering changes in the brain that could lead to neurodegenerative diseases.

"We suspect it involves multiple factors," [says one of the researchers](#), Rima McLeod from the University of Chicago.

"At the core is alignment of characteristics of the parasite itself, the genes it expresses in the infected brain, susceptibility genes that could limit the host's ability to prevent infection, and genes that control susceptibility to other diseases present in the human host."

To find this, the researchers analysed data from the [National Collaborative Chicago-Based Congenital Toxoplasmosis Study](#), which since 1981 has monitored 246 infants with congenital toxoplasmosis, the infection caused by *T. gondii*.

The results showed that fragments of microRNA and proteins found in children with severe toxoplasmosis matched up with biomarkers found in patients with a range of neurodegenerative conditions, including Alzheimer's and Parkinson's.

They also found the parasite might increase the risk of epilepsy due to altering communication between brain cells called GABAergic neurons, and discovered links between *T. gondii* and almost 1,200 human genes that play a role in various cancers.

To be clear, the researchers aren't saying the brain parasite is definitively what's behind people developing these debilitating illnesses, but it's possible that *T. gondii*'s protein-based meddling in the brain environment could possibly influence or enable pre-existing susceptibilities in some people to these kinds of diseases.

"We hypothesise that disease occurs in the presence of the relevant susceptibility genes, parasite genotype and other innate and

environmental factors such as other infections, the microbiome, or stress that influence immune responses," the authors write in their [paper](#).

It's a disturbing finding – especially since previous estimates have suggested *T. gondii* could infect as much [as half of the global population](#) – but there's no sense in getting alarmed until we know a lot more about what's going on here.

It will fall to future studies to examine the parasite's potential impact on our neural pathways further – and in doing so, new discoveries could lead to some positive upsides to this sobering research.

"At the same time," [says Steinler](#), "we have to translate aspects of this study into preventive treatments that include everything from drugs to diet to lifestyle, in order to delay disease onset and progression."

The findings are reported in [Scientific Reports](#).
