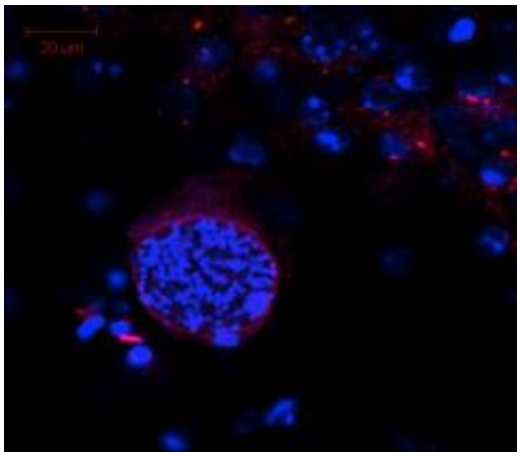
Research supports toxoplasmosis link to schizophrenia

11 March 2009



This is a toxoplasma cyst outlined in red fluorescent cyst dye in mouse brain section. Hundreds of parasites are visible in the cyst as blue dots (nuclei stained blue) and in surrounding brain tissue. Image courtesy of E. Prandovszky

Scientists have discovered how the toxoplasmosis parasite may trigger the development of schizophrenia and other bipolar disorders.

The team from the University of Leeds' Faculty of Biological Sciences (UK) has shown that the parasite may play a role in the development of these disorders by affecting the production of dopamine - the chemical that relays messages in the brain controlling aspects of movement, cognition and behaviour.

Toxoplasmosis, which is transmitted via cat faeces (found on unwashed vegetables) and raw or undercooked infected meat, is relatively common, with 10-20% of the UK population and 22% of the US population estimated to carry the parasite as cysts. Most people with the parasite are healthy, but for those who are immune-suppressed - and particularly for pregnant women - there are significant health risks that can occasionally be fatal.

Dr Glenn McConkey, lead researcher on the project, says: "Toxoplasmosis changes some of the chemical messages in the brain, and these changes can have an enormous effect on behaviour. Studies have shown there is a direct statistical link between incidences of schizophrenia and toxoplasmosis infection and our study is the first step in discovering why there is this link."

The parasite infects the brain by forming a cyst within its cells and produces an enzyme called tyrosine hydroxylase, which is needed to make dopamine. Dopamine's role in mood, sociability, attention, motivation and sleep patterns are well documented and schizophrenia has long been associated with dopamine, which is the target of all schizophrenia drugs on the market.

The team has recently received $250,000 (£160,000) to progress its research from the US-based Stanley Medical Research Institute, which focuses on mental health conditions and has a particular emphasis on bipolar illnesses.

Dr McConkey says: "It's highly unlikely that we will find one definitive trigger for schizophrenia as there are many factors involved, but our studies will provide a clue to how toxoplasmosis infection - which is more common than you might think - can impact on the development of the condition in some individuals.

"In addition, the ability of the parasite to make dopamine implies a potential link with other neurological conditions such as Parkinson's Disease, Tourette's syndrome and attention deficit disorders, says Dr McConkey. "We'd like to extend our research to look at this possibility more closely."

Source: University of Leeds