NANYANG TECHNOLOGICAL UNIVERSITY

School of Biological Sciences

Reg. No. 200604393R

Research Theme: **Neurobiology and Parasitology**

Research Project Title: **Behavioral manipulation of the host by the parasites**

Principal Investigator/Supervisor: **Ajai Vyas**

Co-supervisor/ Collaborator(s) (if any): **NA**

Project Description

a) Background:

Toxoplasma is a common parasite of birds, rodents, and humans during the asexual phase of its life cycle. But, having sex for Toxoplasma is limited to cat intestines. It enters cat when an infected rat or bird is eaten up. This creates an interesting problem because rats do not prefer to be eaten up. Toxoplasma blocks the fear of cats from infected rats. This is often taken to mean that infected rats will approach cat without fear and be eaten up at higher rates. Toxoplasma is also sexually transmitted through the male ejaculate in rats. Apropos infected male rats make more testosterone; produce more sexual pheromones; and, become more attractive to uninfected females. These observations suggest a second parasitic manipulation of the host behavior, whereby being infected creates greater avenues for sexual transmission of the parasite itself. We are interested in understanding proximate mechanisms of two parasitic behavioral manipulations described above.
More about this system can be found at:
http://journals.plos.org/plospathogens/article?id=10.1371/journal.ppat.1004935

b) Proposed work:
Current questions include:
1. What are the necessary and sufficient neuroendocrine changes within the host that sustain the behavioral manipulation?
2. Are effects of Toxoplasma on host behavior dimorphic between sexes?
3. How does Toxoplasma breech blood-testes barrier?
4. Is Toxoplasma a sexually transmitted infection in humans?
5. Does Toxoplasma increase predation rates of infected rodents under field conditions?

Supervisor contact:

If you have questions regarding this project, please email the Principal Investigator: avyas@ntu.edu.sg;

SBS contact and how to apply:

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