Keep

Microbiology MW 11:30

Professor Briggs

Journal Article Report #2

Part 1

Trypanosoma brucei is a protozoan human pathogen that causes African sleeping sickness. The name of the disease is apt, considering it causes a disruption of the infected host's circadian rhythms. Circadian rhythms are physiological and behavioral patterns set to coincide with our planets roughly 24 hour rotation and its accompanying light-dark cycle. These rhythms influence a myriad of physiological interactions taking place within our complex bodies.

Filipa Rijo-Ferreira, Joseph S. Takahasi and Luisa M. Figuieredo set out to determine whether *T. brucei* have circadian rhythms. To test their hypothesis that parasites have circadian rhythms similar to complex multicellular organisms, the authors used a process called entrainment (imposing an environmental oscillation that causes an organism's physiological processes to mirror the imposed oscillation). Rijo-Ferreira et al. identified parasitic rhythms by entraining *T. brucei* cells with temperature cycles and then monitoring the protozoans' ATP production. The resulting ATP production was indeed synchronous with the imposed temperature oscillations. The authors results supported their hypothesis that *T. brucei*, a parasite, has inherent circadian rhythms. Although this took place in a controlled lab culture setting, the authors' findings may prove useful for disease treatment in an infected host. If scientists are able to decipher a pathogen's circadian rhythms, then treatments can be designed to take advantage of a pathogen that is "sleeping." Another possible application could be disrupting the pathogen's circadian rhythms causing the pathogen to weaken and/or die.

Part 2

Adenosine triphosphate is a molecule that cells use to manage energy requirements. ATP releases its energy when the ATP loses its third phosphate, known as the terminal phosphate. Several methods are used by cells to produce ATP. *T. brucei* is a chemoheterotroph, an organism that generates energy by breaking down organic molecules found in their environment, the human bloodstream. *T. brucei* utilizes oxidative phosphorylation, which includes the electron transport chain to synthesise ATP.

good

Human blood is ideal for oxidative phosphorylation because it is oxygen rich. Oxygen is the final acceptor of electrons in the electron transport chain. *T. brucei* are ideally suited to this environment. This protozoan has a flat body and uses an external flagella to navigate the maze of arteries and arterioles present in the host. Because sexual reproduction takes place inside humans, humans are considered *T. brucei'* definitive host. *T. brucei* is transmitted to humans by a vector, the tsetse fly. The tsetse fly acquires the protozoan by feeding on infected wild animals which are largely unaffected by the parasite.

Part 3

Rijo-Ferreira et al. do not appear to be biased for or against any particular scientific or political agenda. The article is scientifically viable, meaning proper scientific protocol was followed. The authors objectively report their findings without subjecting the reader to superfluous subjective commentary. The images, and charts do not appear to be skewed in any direction. All of the authors facts and sources are cited. There do not appear to be affiliated parties who stand to gain from the authors' conclusions. Rather, the authors are presenting their findings to help further the understanding of *T. brucei.*

6
6
6
5
1
1

+25/

Excellent work.

Can I keep this as an example?