Parasite study paves way for infection therapies

October 10 2017

Fresh insight into how a harmful parasite harnesses the energy it needs to function could point towards therapies to prevent potentially fatal diseases.

New understanding of the infectious parasite, known as leishmania – which is spread by biting sandflies – points towards ways to limit its impact. The findings could help curb related infections, which cause a million cases of disease and kill 20,000 to 30,000 people around the world each year.

Crystal imaging

Researchers used sophisticated imaging techniques to show how drugs could be designed to kill the parasite by targeting a key enzyme linked to its metabolism. A team from the University of Edinburgh studied how activity in this enzyme, called LmFBPase, is controlled by another molecule known as AMP.

Using crystal structures, they revealed the biological mechanism by which AMP prevents the enzyme from functioning. Scientists compared this to the equivalent process in humans, and found that it works in a slightly different way.

Treatment opportunity

AMP binds differently to the enzyme in humans compared with in parasites. These differences provide opportunities to develop drug molecules that would target the enzyme in parasites, but would have no effect on people. The study, published in the *Journal of Molecular Biology*, was supported by Wellcome, the Scottish University Life Sciences Alliance and the Biotechnology and Biological Sciences Research Council.

"Our detailed studies show how drugs might be developed to target these deadly parasites, without causing additional harm to affected people," says Professor Malcolm Walkinshaw.

More information: Meng Yuan et al, Structures of Leishmania Fructose-1,6-Bisphosphatase Reveal Species-Specific Differences in the Mechanism of Allosteric Inhibition, *Journal of Molecular Biology* (2017). DOI: 10.1016/j.jmb.2017.08.010

Provided by University of Edinburgh