THE UNIVERSITY of EDINBURGH

# *News Release*

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## Enzyme discovery paves way to tackling deadly parasite diseases

An enzyme found in all living things could hold the key to combatting deadly diseases such as sleeping sickness, a study suggests.

Research into the enzyme, which helps cells convert nutrients into energy, has shown that it is activated in different ways in various species.

Researchers say this discovery creates an opportunity to design drugs that block activity of the enzyme – known as pyruvate kinase – in species that cause infection. Blocking the enzyme would effectively kill the parasite, without affecting the same enzyme in the patient.

Findings from the study could lead to new treatments for diseases spread by parasites – including sleeping sickness and Chagas disease – that affect millions of people in the developing world.

Researchers say the finding could ultimately help tackle a range of healthcare problems, including antibiotic resistance and some forms of cancer.

Scientists used a range of analytical techniques to discover how pyruvate kinase functions in parasites, mammals and bacteria.

They found that the enzyme becomes active in all species in a similar way. A small sugar molecule binds to the enzyme to kick-start the process of nutrient absorption. But each species has a unique mechanism for activating the enzyme, providing opportunities to design drugs that block its activity in individual species.

The study is published in the first edition of the journal *Royal Society Open Science*.
The work was funded by the Medical Research Council, Wellcome Trust, Scottish University Life Sciences Alliance and Biotechnology and Biological Sciences Research Council.

Professor Malcolm Walkinshaw, Chair of Structural Biology at the University of Edinburgh, who led the study, said: “With this discovery, we’ve found an Achilles heel for sleeping sickness and many other conditions. Fresh discoveries about this key enzyme – pyruvate kinase – could enable the design of treatments to tackle disease without harm to the patient.”

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