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- PRESS RELEASE -

## **A new aspect in *Plasmodium falciparum*'s life cycle is revealed: "express" sexual conversion**

*Conversion from the asexual to the sexual phase of the malaria parasite is necessary for its transmission to the mosquito*

**Barcelona, 20 November 2018** -. A study led by the Barcelona Institute for Global Health (ISGlobal), an institution supported by "la Caixa" Foundation, reveals a **new mechanism by which the malaria parasite *Plasmodium falciparum* converts from its asexual to its sexual form**, which can be transmitted to the mosquito. The results, published in **Nature Microbiology**, provide important information on the parasite's lifecycle and will eventually contribute to design strategies aimed at stopping its transmission.

Human to mosquito transmission of the malaria parasite requires that some parasites in the blood stop replicating asexually and convert into sexual forms called gametocytes. This sexual conversion represents therefore an ideal target for stopping parasite transmission. However, the molecular mechanisms by which this process occurs remain poorly characterized.

**Alfred Cortés**, ICREA researcher at ISGlobal, and his team used a protein that is expressed only when the cell "decides" to differentiate into a gametocyte (a moment when it is indistinguishable from the asexual phase). Using the CRISPR-Cas9 gene editing technique, they labelled such protein (called PfAP2-G) with a green fluorochrome, and **re-examined the hypothesis that, between cell commitment and sexual conversion, the parasite needs to undergo a replication cycle**.

Using a culture system in the lab, the team found that **some parasites directly convert into gametocytes**, without an additional replication cycle. "The point at which the parasite decides to become a gametocyte turned out to be earlier than previously thought," explains Cortés. "In fact, although its life cycle was described more than 100 years ago, it continues surprising us," he adds.

"Our results indicate that those parasites activating the expression of PfAP2-G early enough during the cycle can take the rapid route, whereas the others need to go through a replication cycle before converting into gametocytes," explains first author Cristina Bancells. "This rapid route could favour the parasite's survival and transmission in a 'dangerous' situation, for example in the case of drug treatment," she adds. For the authors, **these results provide an extended model for the early steps of sexual differentiation in *P. falciparum***. They also point to the need for further studies to establish how often parasites use one or the other sexual conversion pathway (classical versus "express") *in vivo*.

"Of note, gametocytes are a priority target for public health interventions aimed at reducing malaria transmission, and eventually eliminating it," says Cortés.

### **Reference**

Bancells C, Llorà-Batlle O, Poran A, *et al.* [Revisiting the initial steps of sexual development in the malaria parasite \*Plasmodium falciparum\*](#), Nature Microbiology. DOI: 10.1038/s41564-018-0291-7

## About ISGlobal

The Barcelona Institute for Global Health (ISGlobal), the result of an innovative alliance between the “la Caixa” Foundation, academic institutions and government bodies, was set up to contribute to the work undertaken by the international community to address the challenges of health in a globalised world. ISGlobal is a consolidated hub of excellence based on research and health care that has grown from the work first started in the world of clinical care by the Hospital Clínic and the Parc de Salut MAR and in the academic sphere by the University of Barcelona and Pompeu Fabra University. The core mechanism of its work model is the transfer of knowledge generated by scientific research to practice, a task undertaken by the institute’s Education and Policy and Global Development departments ISGlobal belongs to the Catalan Government’s CERCA network.

## Press ISGlobal

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