

Parasites too engage in sex

Scientists uncover clues hidden in the parasite's genomic code

10-09-19



Dit is de omschrijving

Trypanosoma cruzi is the parasite responsible for Chagas disease, found in Latin America, the US and increasingly among Latin American migrants in Southern Europe. Around eight million people are currently affected by the disease, which can cause irreversible damage to the heart and digestive tract. An international group of scientists have sequenced and analysed the whole genome of the single-celled parasite Trypanosoma cruzi and resolved 30 years of heated debate to show that it indeed can be sexually active. This study was published in Nature Communications and was led by the University of Glasgow. Genomics scientists at the Institute of Tropical Medicine (ITM) in Antwerp helped deciphering and interpreting the complex genetic code.

Chagas disease is mostly spread by insects known as Triatominae, or "kissing bugs", but can also be transmitted by contaminated fruit, blood transfusion and from mother to child during pregnancy. While treatment can cure patients if given early enough, once the disease is established it is less effective.

Sex in biological organisms is important for many different reasons, primarily to evolve and most organisms do engage in sexual activity of one sort or another. By studying a large group of parasites found in a small area in Ecuador, and sequencing the whole genome of those they found, the researchers were able to spot the tell-tale signatures that sexual activity leaves in the genes.

"Sex is evident for many species, but remains difficult to establish for the tiniest organisms on Earth. Thanks to technological advances we can now determine the genetic code and make predictions about their sexual activity," says genomics expert Dr Frederik Van den Broeck from ITM's Unit of Molecular Parasitology, who contributed to the study.

Lead author of the research, Dr Philipp Schwabl from the University of Glasgow, says: "There has been a lot of argument among scientists about whether *T. cruzi* is sexual or not. It turns out people weren't looking in the right places. We sampled and analysed, in unprecedented detail, the parasites found in a small geographic area in Ecuador. Remarkably, we discovered that some groups of parasites can be highly sexual. However, it also seems other groups of parasites from very nearby sites can behave very differently – seemingly completely abstinent."

"These parasites can exert different strategies to reproduce. It remains unclear why, but our research at ITM has shown similar patterns in *Trypanosoma congolense*, the major agent of Animal African Trypanosomiasis and in *Leishmania*, the parasite responsible for leishmaniasis. These studies on the fundamental biology of parasites are relevant to predict the role of sex in spreading epidemiologically relevant traits such as drug resistance," concludes Dr Frederik Van den Broeck.

The study, 'Meiotic sex in Chagas disease parasite *Trypanosoma cruzi*' is published in Nature Communications. <https://www.nature.com/articles/s41467-019-11771-z>