





Antigenic variation in *Giardia lamblia* is regulated by RNA interference

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RESUMEN

Giardia lamblia (also called *Giardia intestinalis*) is one of the most common intestinal parasites of humans. To evade the host's immune response, *Giardia* undergoes antigenic variation - a process that allows the parasite to develop chronic and recurrent infections. From a repertoire of ~190 variant-specific surface protein (VSP)-coding genes, *Giardia* expresses only one VSP on the surface of each parasite at a particular time, but spontaneously switches to a different VSP by unknown mechanisms. Here we show that regulation of VSP expression involves a system comprising RNA-dependent RNA polymerase, Dicer and Argonaute, known components of the RNA interference machinery. Clones expressing a single surface antigen efficiently transcribe several VSP genes but only accumulate transcripts encoding the VSP to be expressed. Detection of antisense RNAs corresponding to the silenced VSP genes and small RNAs from the silenced but not for the expressed *vsp* implicate the RNA interference pathway in antigenic variation. Remarkably, silencing of Dicer and RNA-dependent RNA polymerase leads to a change from single to multiple VSP expression in individual parasites.

TIPO DE DOCUMENTO: Artículo

DOI: <https://doi.org/10.1038/nature07585>

PALABRAS CLAVE: Argonaute protein. Complementary RNA. Dicer. Membrane protein. RNA polymerase.

TEMAS: R Medicina > R Medicina (General)

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Salud