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An ecologist's perspective on sexually transmitted diseases (STDs): Host manipulation by STD agents as an explanation of silent infection modes and behavioral changes in HIV-infected MSM**Martin Heil**

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Sexually transmitted diseases (STDs) such as Syphilis, Hepatitis B and C, or the Human Immunodeficiency Virus (HIV), maintain an asymptomatic, 'silent' mode of infection over extended time periods. Moreover, increased sexual activity, promiscuity and risk-taking sexual practices have been observed among HIV-infected men, particularly men who have sex with men (MSM). Both features complicate early diagnosis and therapy, favour transmission rates and represent a major driver of the world-wide increase in STD infection rates. I propose the 'host manipulation hypothesis' as a framework to understand phenotypic and behavioural in human hosts to STDs. A manipulation of host phenotypes by parasites has been suggested as an evolutionary explanation of seemingly odd phenomena like the 'fatal' attraction of *Toxoplasma*-infected mice to cat urine, enhanced risk-taking behavior in *Toxoplasma*-infected men, or the attraction of Plasmodium-vectoring mosquitoes to people with Malaria. A literature survey revealed that STDs are under-represented in the literature on fatigue and sickness behaviour, as compared to non-sexually transmitted human infections. Evidently, STD agents would gain significant adaptive benefits when they employ mechanisms that suppress host sickness behaviour (including decreased sexual activity) or avoid the rejection of infected partners during mating. Moreover, reports on enhanced testosterone levels in mammals infected with *Toxoplasma gondii* or Feline Immunodeficiency Virus (FIV) provide attractive models of molecular mechanisms that could underlie the intriguing behavioural changes in HIV-infected MSM. I hope that this ecologist's perspective will motivate interdisciplinary research aimed at an understanding of the specific effects of STDs on human hosts.

Biography

Martin Heil obtained his Doctoral degree in Ecology from Würzburg University, Germany, performed Postdoctoral studies in France, was Junior Group Leader at the Max-Planck-Institute for Chemical Ecology in Jena, Germany, and Chair of the Department of General Botany at Essen University, Germany. In 2007, he moved to CINVESTAV Irapuato, Mexico, where he leads the Plant Ecology Lab. He is on the editorial boards of *Trends Plant Sci.*, *J Ecol.*, *J Chem. Ecol.*, *Front Plant Sci.* and *Oecologia*. He has published 130 journal articles to which Research Gate registers over 8000 citations (h-index 42).

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