

SEEWIESEN

LECTURE SERIES

FALL/WINTER 2018/19

Max Planck Institute
for Ornithology



MAX-PLANCK-GESELLSCHAFT

THURSDAY | February 07th, 2019 | 13.00 | HOUSE 4 LECTURE ROOM

GIORGIO F. GILESTRO

Imperial College London | Host: Rattenborg Research Group

A tale of sleepless flies. How *Drosophila* changes what we know about sleep

Our laboratory studies the neurobiology of behavior in *Drosophila melanogaster*, with a strong emphasis on sleep. In particular, we are trying to uncover the still mysterious function(s) of sleep, using a systems neuroscience approach. The talk will present some of the most recent data of the lab as paradigmatic of what flies can teach us about sleep: using a machine-learning based video-tracking technology, we conducted a detailed high-throughput analysis of sleep in the fruit fly *Drosophila melanogaster*, coupled with a life-long chronic and specific sleep restriction. Our results show that some wild-type flies are virtually sleepless in baseline conditions and that complete, forced sleep restriction is not necessarily a lethal treatment in wild-type *Drosophila melanogaster*. We also show that circadian drive, and not homeostatic regulation, is the main contributor to sleep pressure in flies. We propose a three-partite model framework of sleep function, according to which, total sleep accounts for three components: a vital component, a useful component, and an accessory component.

WHO IS GIORGIO F. GILESTRO?

- 2002 – 2006 PhD Student at Research Institute of Molecular Pathology (IMP), Vienna, Austria
- 2006 – 2009 Postdoc at University of Wisconsin Madison, Madison, WI, USA
- 2010 – 2012 Junior Research Fellow at Imperial College London, London, UK
- 2012 ongoing Lecturer and Lab head at Imperial College London, Department of Life Sciences, London, UK

SELECTED PUBLICATIONS

- Geissmann Q\$, Beckwith EJ\$, and Gilestro GF - Most sleep does not serve a vital function. Evidence from *Drosophila melanogaster* – bioRxiv, 2018 Jul 4 – doi:10.1101/361667 – in press on Science Advances
- Geissmann Q, Garcia Rodriguez L, Beckwith EJ, and Gilestro GF - Rethomics: an R framework to analyse high-throughput behavioural data - bioRxiv, 2018 Apr 21 – doi:10.1101/305664 – in press on PLoS ONE
- Geissmann Q, Garcia Rodriguez L, Beckwith EJ, French AS, Jamasb AR, and Gilestro GF - Ethoscopes: an open platform for high-throughput ethomics - PLoS Biology, 2017 Oct 19; 15(10);e2003026
- Beckwith EJ, Geissmann Q, French AS, and Gilestro GF - Regulation of sleep homeostasis by sex pheromones - eLife, 2017 Sep 12;6:e27445
- Gilestro GF, Tononi G and Cirelli C - Widespread changes in synaptic markers as a function of sleep and wakefulness in *Drosophila* - Science, 2009 Apr 3;324(5923):109-12.

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