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Hassan Salem, Ph.D.

Evolutionary Ecology

Emory University, Atlanta

Born in 1986 in Cairo

Studied Botany at Miami University and at the Max Planck Institute for Chemical Ecology, Jena

FELLOWSHIP
College for Life Sciences

PROJECT

Microbial Mediation of Folivory

Numerous adaptations in animals are a direct consequence of symbiotic partnerships with microorganisms. A core aim in my research is to study symbioses across multiple levels of biological organization, from the molecular and physiological mechanisms underlying the initiation and maintenance of these associations to the ecological and genetic consequences of coevolution. Leveraging advances in genomics and transcriptomics, in combination with bioassays and biochemical analyses, I apply these tools to discover bacterial diversity in herbivorous insects and, more significantly, to reveal how microbial metabolic capabilities functionally contribute to the phenotypic complexity of their hosts. To this aim, phytophagous insects are central to my research program, serving as a model to study the role of microbes in mediating folivory in animals and to better understand the evolutionary ecology of an exceptionally diverse phytophagous lineage: leaf beetles (Coleoptera: Chrysomelidae). For my stay at the Wissenschaftskolleg, my aim is to develop the conceptual and experimental framework necessary to uncover the breadth of symbiotic partnerships between leaf-feeding insects and bacteria, as well as to understand the adaptive impact of these partnerships.

Recommended Reading

Salem H., E. Bauer, R. Kirsch, A. Berasategui, M. Cripps, B. Weiss, R. Koga, K. Fukumori, H. Vogel, T. Fukatsu, and M. Kaltenpoth (2017). "Drastic genome reduction in an herbivore's pectinolytic symbiont." Cell 171, 1520-1531.

Salem, H., L. Florez, N. Gerardo, and M. Kaltenpoth (2015). "An out-of-body experience: the extracellular dimension for the transmission of mutualistic bacteria in insects." Proceedings of the Royal Society B: Biological Sciences 282, 20142957.

Salem, H., E. Bauer, A. Strauss, H. Vogel, M. Marz, and M. Kaltenpoth (2014). "Vitamin supplementation by gut symbionts ensures metabolic homeostasis in an insect host." Proceedings of the Royal Society B: Biological Sciences 1796, 20141838.

PUBLICATIONS FROM THE FELLOW LIBRARY

Salem, Hassan (London,2020)

Symbiont digestive range reflects host plant breadth in herbivorous beetles

https://kxp.k10plus.de/DB=9.663/PPNSET?PPN=1733163883

Salem, Hassan (Barsingstoke,2019)

Minimal fermentative metabolism fuels extracellular symbiont in a leaf beetle

https://kxp.k10plus.de/DB=9.663/PPNSET?PPN=1687023484

Salem, Hassan (Oxford [u.a.],2017)

Gut microbiota of the pine weevil degrades conifer diterpenes and increases insect fitness

https://kxp.k10plus.de/DB=9.663/PPNSET?PPN=1024216314

Salem, Hassan ([Cambridge, Mass.],2017)

Drastic genome reduction in an herbivore's pectinolytic symbiont

https://kxp.k10plus.de/DB=9.663/PPNSET?PPN=1024215350

Salem, Hassan (2016)

Potential applications of insect symbionts in biotechnology

https://kxp.k10plus.de/DB=9.663/PPNSET?PPN=1024216721

Salem, Hassan (2015)

Symbiont transmission entails the risk of parasite infection

https://kxp.k10plus.de/DB=9.663/PPNSET?PPN=1024217752

Salem, Hassan (2015)

An out-of-body experience : the extracellular dimension for the transmission of mutualistic bacteria in insects

https://kxp.k10plus.de/DB=9.663/PPNSET?PPN=1024217191

Salem, Hassan (2014)

Transcriptomic immune response of the cotton stainer Dysdercus fasciatus to experimental elimination of vitamin-supplementing intestinal symbionts

https://kxp.k10plus.de/DB=9.663/PPNSET?PPN=102422080X

Salem, Hassan (London,2014)

Vitamin supplementation by gut symbionts ensures metabolic homeostasis in an insect host

https://kxp.k10plus.de/DB=9.663/PPNSET?PPN=1024220230

Salem, Hassan (2013)

Actinobacteria as essential symbionts in firebugs and cotton stainers (Hemiptera: Pyrrhocoridae)

https://kxp.k10plus.de/DB=9.663/PPNSET?PPN=1024219097