

**BIOGRAPHICAL SKETCH**

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NAME: Gabrieli, Paolo

ORCID\_ID: 0000-0002-4996-2468

POSITION TITLE: Associate Professor of Zoology

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

| INSTITUTION AND LOCATION                 | DEGREE<br>(if<br>applicable) | Completion<br>Date<br>MM/YYYY | FIELD OF STUDY                      |
|------------------------------------------|------------------------------|-------------------------------|-------------------------------------|
| Università degli Studi di Pavia, Italy   | Bachelor's<br>Degree         | 07/2005                       | Biological Sciences                 |
| Università degli Studi di Pavia, Italy   | Master's<br>Degree           | 07/2007                       | Applied and<br>Experimental Biology |
| Università degli Studi di Pavia, Italy   | PhD                          | 02/2011                       | Cellular Biology                    |
| Università degli Studi di Perugia, Italy | Postdoctoral                 | 11/2013                       | Mosquito Reproductive<br>Biology    |
| Imperial College, London (UK)            | Postdoctoral                 | 05/2014                       | Mosquito Reproductive<br>Biology    |
| Università degli Studi di Pavia, Italy   | Postdoctoral                 | 01/2019                       | Insect Biology and<br>behaviour     |

**A. Personal Statement**

I am an Associate Professor of Zoology, and my research focuses on the biology of insects, with a particular emphasis on mosquitoes. The ultimate goal of my work is to identify novel strategies to combat the spread of mosquito-borne diseases. My academic background spans multiple biological disciplines, including biochemistry, molecular biology, and genetics, which is evident from my education. This multidisciplinary foundation is reflected in my published studies, which integrate techniques from various fields to address key questions about the life traits of mosquitoes. As a Principal Investigator (PI) or co-Investigator on several university, local, national, and international funded grants, I have laid the groundwork for this research by studying the molecular and cellular components of the mosquito proboscis, as well as its interactions with mosquito saliva and host factors. Notably, my team, collaborators, and I discovered a previously unknown feedback mechanism that enables the tiger mosquito (*Aedes albopictus*) to regulate blood feeding efficiently within a brief timeframe (approximately one minute). Throughout these studies, we developed specialized protocols and acquired the biological and technical expertise necessary to advance the proposed research project. In summary, I bring the expertise, leadership, training, and motivation required to successfully execute the proposed work.

Ongoing and recently completed projects that I would like to highlight include:

(PI: Coordinator; co-PI: co-coordinator; R.U.: Research Unit).

- 2024-2025: Fondazione INFACCT-AH MCA.  
Title: TOXMOS: TOXic males for MOSquito Control  
150.000 €; PI
- 2023-2025: PRIN2022. 20225HNCZK.  
Title: SMACK: The Saliva-Mediated feedbaCK signal affecting mosquito biting  
218.795 €; PI
- 2023: European Synchrotron Radiation Facility (ESRF) LS-3255  
Title: The evolution of non-biting mosquitoes: morphological analysis by X-ray tomography meets genomics  
48 hours of Synchrotron access; PI
- 2022: European Synchrotron Radiation Facility LS-3215  
Title: The mosquito endoscopy, or how do mosquitoes orient proboscis in the human skin  
48 hours of Synchrotron access; PI
- 2019/2022: MUR PRIN 2017  
Title: Stopping mosquito bites through targeting of novel secondary messengers in the insect's saliva  
366.000 €, R.U.
- 2019/2022: NATO Science for Peace and Security.  
Title: Novel compounds to limit the mosquito-borne pathogens and associated infections in tropical and subtropical scenarios  
300.000 €, R.U.
- 2019: SLS 20190514  
Title: The use of tomographic microscopy to uncover the morphology and the biogenesis of the mouthparts of Aphids and Mosquitoes  
24 hours of Synchrotron access; PI
- 2018/2021 Fondazione Cariplo: 2017-0798.  
Title: A thorough understanding of the molecular players causing the Skeeter Syndrome  
250.000 €; PI

## **B. Positions, Scientific Appointments, and Honors**

- 10/2023-present: Università degli Studi di Milano. Associate Professor; SSD BIOS-03 (ex BIO-05; Zoologia)
- 2023 – present: Member, Unione Zoologica Italiana (UZI)
- 10/2020-09/2023: Università degli Studi di Milano. Researcher (Rtd-B); SSD: BIOS-03 (ex BIO-05; Zoologia)
- 03/2020-09/2020: Università degli Studi di Milano. Research contract (project “Cariplo-Giovani ricercatori 2017”; PI (2017-0798))
- 03/2019-09/2019: Università degli Studi di Milano. Research contract (project “Applicazione di strumenti biotecnologici per il controllo delle infezioni”\_ Prof. Claudio Bandi)
- 02/2018-01/2019: Università degli Studi di Pavia. Assegno di ricerca (project: “Cariplo-ERC 2016”, PI (2016-0952))
- 03/2016- present: Università degli Studi di Pavia. Visiting Research Fellow. Laboratory of Biocrystallography (prof. Federico Forneris)
- 02/2015-01/2018: Università degli Studi di Pavia. Assegno di ricerca di tipo A (Dipartimento di Biologia e Biotecnologie).
- 06/2014-12/2014: “Borsa di studio Fondazione Buzzati Traverso”, Università degli Studi di Pavia.
- 12/2013-05/2014: Imperial College, London, UK. Research Associate. Laboratory prof. Flaminia Catteruccia
- 09/2012-06/2013: Harvard School of Public Health, Boston, MA, USA. Visiting Research Fellow. Laboratory prof. Flaminia Catteruccia
- 04/2011-11/2013: Università degli Studi di Perugia. Assegno di ricerca (project: ERC StG 2010\_Prof. Flaminia Catteruccia (ERC-2010-StG\_20091118)).
- 11/2010-03/2011: Università degli Studi di Pavia. Borsa di studio (Dipartimento di Biologia Animale).

### C. Contributions to Science

Over the years, I have worked on several research topics (55 published papers in international peer-reviewed journals, 1 book chapter; *h-factor* based on Scopus: 20).

However, two main research topics characterized my investigations.

**MOSQUITO REPRODUCTION:** A central theme of my research has been insect reproduction, particularly in mosquitoes. This line of research has included studies on the reproductive behavior of *Ceratitis capitata* an agriculturally significant species, and *Glossina fuscipes fuscipes*, one of the tsetse fly species responsible for transmitting African trypanosomiasis. During my postdoctoral years at the University of Perugia, Harvard School of Public Health, and Imperial College, my research centered on the reproduction of the African malaria mosquito *Anopheles gambiae*. These studies led to the development of a technique for mosquito population control through chemical sterilization, as reported in a patent for which I am co-inventor. In recent years, this research has progressed independently, focusing on how reproductive stimulation, larval nutrition, and blood meal-seeking behavior influence mosquito biology.

- Bascunà P, **Gabrieli P**, Mameli E, Catteruccia F. (2020) Mating-regulated atrial proteases control reinsemination rates in *Anopheles gambiae* females. *Sci Rep.* 10(1):21974.
- Dittmer J & **Gabrieli P** (2020) Transstadial metabolic priming mediated by larval nutrition in female *Aedes albopictus* mosquitoes. *J Insect Physiol*, 3:104053
- Dittmer J, Alafndi A, **Gabrieli P** (2019) Fat body-specific vitellogenin expression regulates hostseeking behaviour in the mosquito *Aedes albopictus*. *PLoS Biol*, 17(5): e3000238
- Childs LM, Cai FY, Kakani EG, Mitchell SN, **Gabrieli P**, Buckee CO, Catteruccia F (2016) Disrupting Mosquito Reproduction and Parasite Development for Malaria Control. *PloS Path*, 12: e1006060
- **Gabrieli P**, Scolari F, Di Cosimo A, Savini G, Fumagalli M, Gomulski LM, Malacrida AR, Gasperi G (2016) Sperm-less males modulate female behaviour in *Ceratitis capitata* (Diptera: Tephritidae). *Insect Biochem and Mol Biol*, 79: 13- 26
- **Gabrieli P**, Kakani EG, Mitchell N, Mameli E, Want E, Mariezcurrena Anton A, Serrao A, Baldini F, Catteruccia F (2014) Sexual transfer of the steroid hormone 20E induces the postmating switch in *Anopheles gambiae*. *Proc Natl Acad Sci U S A*, 111(46):16353-16358
- Shaw WR, Teodori E, Mitchell SN, Baldini F, **Gabrieli P**, Rogers DW, Catteruccia F (2014) Mating activates the heme peroxidase HPX15 in the sperm storage organ to ensure fertility in *Anopheles gambiae*. *Proc Natl Acad Sci USA*, 111(16): 5854-5859

**MOSQUITO SALIVA and PROBOSCIS:** In recent years, I have been developing an independent line of research, supported by numerous national and international collaborations, to study MOSQUITO SALIVA and PROBOSCIS. The primary objective of this project is to explore the biology and functions of saliva to develop innovative control techniques or strategies to reduce the transmission of diseases carried by these blood-feeding dipterans. By pursuing these projects, the candidate I have expanded my technical expertise into additional branches of biology, including Structural Biology and tomography.

- Cayrol B, Arnoldi I, Novak V, Epis S, Brilli M, Rahbé Y, Uzest M, **Gabrieli P** (2024) The development of the piercing mouth during the last molt of the diseases-transmitting aphids and mosquitoes as revealed by synchrotron X-ray microtomography. *Entomologia Generalis* 44(4): 1069 – 1079
- Arnoldi I, Villa M, Mancini , Varotto-Boccazzi I, Yacoub M-R, Asperti C, Mascheri A, Casiraghi S, Epis S, Bandi C, Dagna L, Forneris F, **Gabrieli P** (2023) IgE response to Aed al 13 and Aed al 14 recombinant allergens from *Aedes albopictus* saliva in humans. *World Allergy Organization Journal*, 16 (11), 100836.
- Arnoldi I, Mancini G, Fumagalli M, Gastaldi D, D'Andrea L, Bandi C, Di Venere M, Iadarola P, Forneris F, **Gabrieli P** (2022) A salivary factor binds a cuticular protein and modulates biting by inducing morphological changes in the mosquito labrum. *Current Biology*, 32 (16), pp. 3493-3504.e11.

**Complete List of Published Work in ORCID:** <https://orcid.org/0000-0002-4996-2468>