

CURRICULUM VITAE

DR ANASTASIA ACCOTI

ACADEMIC QUALIFICATIONS:

2019 - PhD System Biology of immunity and infective diseases, Genomic and genetic of the host-vector relationship (XXXI cycle), Department Experimental Medicine, University of Perugia, Italy. Primary advisor: Prof Roberta Spaccapelo. Co-advisors: Prof Guido Favia.

2015 – Master of Applied Biology, (Major: Microbiology, Genetics), Polytechnic University of Marche, Italy Advisor: Prof Guido Favia

2012 - Bachelor of Biological Science, Polytechnic University of Marche, Italy Advisor: Prof Vincenzo Caputo

EMPLOYMENT HISTORY:

- February 2020 – December 2020 – Post-doctoral Researcher, Department of Molecular Microbiology & Immunology, Bloomberg School of Public Health, Johns Hopkins University, Baltimore, Maryland, United States. Advisor: Prof George Dimopoulos.
- October 2018 – October 2019 - Post-doctoral Researcher, Department of Experimental Medicine, University of Perugia. Advisor: Prof Roberta Spaccapelo
- April 2015-July 2015 -Scholarship fellow, Department of Biosciences and Veterinary Medicine at University of Camerino, Italy Advisor: Prof Guido Favia

EXPERTISE:

I have a strong background in mosquito microbiota and mosquito immunity. In fact, during my doctoral thesis on '*Symbiotic based study for advance knowledge and control of Mosquito-Borne-Disease*, I examined the impact of the *plasmodium* infection in mosquito microbiota, with a special look into the mosquito saliva. I was involved mainly in two projects, the first project, was to improve the information of the mechanism that determine the multiple and complex interaction between parasite, vector, mosquito symbionts and the vertebrate host. Initially, analyzing the relative abundance of the microbial community in *Anopheles gambiae* and *stephensi* laboratory reared (midgut, salivary glands and saliva), or infected with *P. berghei* or not, with two approaches (16s Metagenomic analysis and Maldi-TOF analysis). Afterwards, using a *Serratia* strain model isolated from *Drosophila* (Db-11GFP strain), I investigated its ability to be horizontal and vertical transmitted in *Anopheles* mosquitoes and its contribution in the mosquito saliva using in vitro (immobilized mosquitoes) and in vivo techniques (mouse model). The other project was focused on the potentiality of transgenic *Anopheles gambiae* line (Vg-WSP) expressing the *Wolbachia* Surface Protein, to affect *P. berghei*

development through the immune stimulation made by the WSP transgenic expression. This project not only highlighted the potential to artificially reduce malaria infection in mosquitoes using single *Wolbachia*-derived antigens, instead of the entire organism, and may help unravel the resistance mechanism underlying the field application of these symbionts.

In my first year of Post Doc at the University of Perugia I engineered *Anopheles* symbiont, *Serratia* (Ag-dsRED) and characterized its ability to re-colonize *Anopheles* organs, also analysing its contribution in the mosquito saliva through the bite back in the animal model (mouse).

Then, I performed a RNA-seq analysis (Infravec2) of the Vg-WSP transgenic line and WT mosquitoes to reveal the mechanism of *Plasmodium berghei* resistance made by the *Wolbachia* Surface Protein transgenic expression in *An. gambiae* Vg-WSP line. Moreover, I set up and followed the metagenomic analysis of the bacterial contribution of *An. gambiae* mosquito males during mating.

Finally, I continued the collaboration with the researcher associate Mathew Pierce, regarding the investigation of the JNK involvement during *Plasmodium berghei* infection, analysing fecundity and parasite load in JNK-knock down mosquitoes.

In my current position at the John Hopkins Bloomberg School of Public Health I am focus on the discovery of potential entomopathogenic fungi. Within this framework, I have isolated fungi from different environments and tested them to see their ability to kill *An. gambiae* and *Ae. Aegypti*. Moreover, I probed into the killing mechanisms of these fungi and investigated whether the mosquitocidal activities could be a result of potential toxic fungus-produced metabolites, or the actual infection by live fungi.

I also contributed to the advancement of a project developed by the Prof Eric Caragata regarding *Wolbachia*, an insect endosymbiont and its interaction with the host immune system, knocking down immune genes of *Aedes aegypti* *Wolbachia* infected mosquitoes (Wbm) that were probably elicited by *Wolbachia* bacterium

My technical skills developed during the years are the generation of DsRNA for RNA interference, common techniques of molecular biology (DNA and RNA Extraction with kits and traditional methods, PCR amplification, Purification of nucleic acids, DNAsi treatment, RNA Retro-transcription, Mini-preparation of plasmidic DNA), Spectrophotometer, Qubit measurement.

Preparation of samples for 16S Next generation sequencing, Metagenomic data Analysis, RNA Sequencing and data analysis, Real time PCR and data analysis. Bacteria, Fungi and Cells culture on selective media, manipulation of microorganism associated with vector insects, bacterial electroporation, bacterial conjugation, fluorescent microscopy.

Daily activities and maintenance procedures of different WT and transgenic mosquito species (*Anopheles* sp, *Aedes* sp. *Culex* sp.), included blood feeding with membrane feeders, both in cages and in semi-field environments. Dissection and collection of mosquito organs (saliva, midgut salivary glands reproductive organs), intra-thoracic injection of adult mosquitoes. Analysis of the *Plasmodium berghei* infection both in mosquitoes (oocysts and sporozoites count) and in mice (parasitemia/gametocytemia). Analysis of the mosquito fitness (Longevity, Fecundity, Fertility, Larval and Pupal development).

Basic knowledge of Standard Operating Procedures for University Animal House and related maintenance of murine malaria model (Intraperitoneal and cardiac puncture)

REFERENCES

George Dimopoulos, Professor at Johns Hopkins Bloomberg School of Public Health, Molecular Microbiology and Immunology department, gdimopo1@jhu.edu 443-287-0128

Roberta Spaccapelo, Associate Professor of Microbiology at University of Perugia Department of Experimental Medicine roberta.spaccapelo@unipg.it 0755858359

Guido Favia, Full professor of Parasitology at University of Camerino, Department of Biosciences and Veterinary Medicine at University of Camerino, guido.favia@unicam.it 0737403230

PUBLICATIONS:

SUBMITTED (2 December 2020) and CURRENTLY UNDER MINOR REVISION

A Accoti, CS Engadhi and G Dimopoulos, "Discovery of novel entomopathogenic fungi for Mosquito Borne Disease control." *Frontiers in Fungal Biology* deadline submission 2 December 2020

IN PREPARATION

A Accoti, C Damiani, E Nunzi, MV Mancini, G Favia and R Spaccapelo "Mosquito microbiota contribution from the mosquito salivary glands to the vertebrate host" *E life*. 2021

IN PREPARATION

A Accoti, S Epis, C Bandi A. Crisanti, G Favia and R Spaccapelo "Transgenic *Anopheles gambiae* mosquitoes expressing a *Wolbachia* surface protein for fighting Malaria" *Developmental and Comparative Immunology*. 2021

PUBLISHED

MV Mancini, C Damiani, **A Accoti**; M Tallarita, E Nunzi; A Cappelli J Bozic, R Catanzani, P Rossi; M Valzano; A Serrao; I Ricci, R Spaccapelo and G Favia. "Estimating bacteria diversity in different organs of nine species of mosquito by Next Generation Sequencing" *BMC microbiology*. 2018 doi: 10.1186/s12866-018-1266-9

MV Mancini, R Spaccapelo, C Damiani, **A Accoti**, M Tallarita, E Petraglia, P Rossi, A Cappelli, A Capone, M Valzano, M Picciolini, L Facchinelli, I Ricci and G Favia, "Paratransgenesis to control malaria vectors: a semi-field pilot study" *Parasit Vectors*. 2016 doi: 10.1186/s13071-016-1427-3

SELECTED PRESENTATIONS AND POSTERS

A Accoti, S Epis, C Bandi A. Crisanti, G Favia and R Spaccapelo “Transgenic *Anopheles gambiae* mosquitoes expressing a *Wolbachia* surface protein for fighting Malaria”. 1ST Woman in Malaria Conference 22-23-24 March 2021 (Poster)

A Accoti, CS Engadhl and G Dimopoulos “Discovery of novel entomopathogenic fungi for Mosquito Borne Disease control.” Entomology 2020—ESA’s Virtual Annual Meeting - 11-25 November 2020 (Poster)

A Accoti, CS Engadhl and G Dimopoulos “Discovery of novel entomopathogenic fungi for Mosquito Borne Disease control.” John Hopkins Bloomberg School of Public Health Post Doc Forum- 13 July 2020 (Presentation)

A Accoti, S Epis, C Bandi G Favia and R Spaccapelo “Transgenic *Anopheles gambiae* mosquitoes expressing a *Wolbachia* surface protein for fighting Malaria” Embo Workshop Kolymbari 2019, Molecular and Population Biology of Mosquitoes and Other Disease Vectors, Kolymbari, Greece 22-26 July 2019 (Poster)

A Accoti, S Epis, C Bandi G Favia and R Spaccapelo “*Wolbachia* Surface Protein expression in *Anopheles gambiae* is able to elicit the mosquito immune system and decrease the *P. berghei* infection” ECE 2018, XI European Congress of Entomology, 2-6 JULY 2018, NAPLES, Italy (Presentation)

A Accoti, F Papa, M Fortunato, C Boncompagni, E Nunzi and R Spaccapelo. The mosquito’s microbiota as a weapon against Malaria. EMBL Conference: BioMalPar XIII: Biology and Pathology of the Malaria Parasite, 29 - 31 May 2017, Heidelberg, Germany (Poster)

A Accoti, G Peruzzi, F Papa, M Fortunato, S Epis, G Favia and R Spaccapelo. Transgenesis and Paratransgenesis: Alternative approaches for fighting Malaria, XXIII IMN Congress, 19-20 January 2017, Rome, Italy (Poster)

A Accoti, G Peruzzi, M Fortunato, S Epis, C Bandi and R Spaccapelo. Transgenic *Anopheles gambiae* mosquitoes expressing a *Wolbachia* surface protein for fighting Malaria, Winter School on Biotechnology, 23-26 January 2016 (Poster)

MENTORING EXPERIENCE:

During my years as a researcher I was always involved in following bachelor and master students, I trained insectary technician and young PhD students. These experiences helped me to learn how to work in a group team and to expand my mentoring skills.

TRAINING COURSES:

Chemical Waste Management, John Hopkins Bloomberg School of Public health, (2020)

Fire Safety and Hazard Communication, John Hopkins Bloomberg School of Public health, (2020)

JHHS - Prevention of Discrimination and Harassment in the Workplace for Staff - John Hopkins Bloomberg School of Public health, (2020)

Laboratory Safety Preparatory Course, John Hopkins Bloomberg School of Public health, (2020)

Bloodborne Pathogens, John Hopkins Bloomberg School of Public health, (2020)

Animal Care and Use, John Hopkins Bloomberg School of Public health, (2020)
Conflict of Interest and Commitment, John Hopkins Bloomberg School of Public health, (2020)

Title IX and Harassment Prevention Training, John Hopkins Bloomberg School of Public health, (2020)

Correct approach to the animal experimentation. University of Perugia (2017)

Training of health and safety at work (art 37, comma 14-bis 2008 n° 81). University of Perugia (2016)