CURRICULUM VITAE

Surname and name: Arcà Bruno
Citizenship: Italian
Language: Italian, English
Position: Associate Professor Molecular Biology
Department of Public Health and Infectious Diseases – Division of Parasitology
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EDUCATION AND ACADEMIC QUALIFICATION

- Degree in Biological Sciences, University Federico II, Napoli
- PhD in Cellular Biology, University of Pavia
- Teaching Board PhD Course in Genetics and Molecular Biology (Sapienza, since 2014)
- Teaching Board Specialization Course in Infectious and Tropical Diseases (Sapienza, since 2018)
- Scientific habilitation Full Professor 05/E2 (Molecular Biology), ASN 2016
- Scientific habilitation Full Professor 07/H3 (Parasitology), ASN 2016

POSITIONS

• September 1st 2020 to date: Associate Professor of Molecular Biology (BIO11)
• 2011-2020: University Researcher Molecular Biology (BIO11), Dept. of Public Health and Infectious Diseases, Faculty of Farmacy and Medicine, Sapienza University of Rome.
• 2002 – 2011: University Researcher Molecular Biology (BIO11), Dept. of Structural and Functional Biology, Faculty of Science, University Federico II, Napoli.
• 2000-2002: Research Contractor, Dept. of Public Health, I Medical School, University La Sapienza, Roma.
• 1999-2000: EU postdoctoral fellow, European Molecular Biology Laboratory (EMBL), Heidelberg, Germany.
• 1998-1999: EU Return Grant, Dept. of Genetics, General and Molecular Biology, Faculty of Science, University Federico II, Napoli.
• 1996-1998: Fondazione Istituto Pasteur-Cenci Bolognetti Postdoctoral Fellow, Institute of Parasitology, I Medical School, University La Sapienza, Roma.
• 1990-1995: IMBB ed EU postdoctoral fellow, Insect Molecular Genetics Group, Institute of Molecular Biology & Biotechnology (IMBB), Heraklion, Crete, Greece.
• 1989-1990: CNR Fellowship, Institute of Cybernetics, Arco Felice, Napoli.
• 1986-1989: Post-degree training - Dept. of Genetics, General and Molecular Biology, Faculty of Science, University Federico II, Napoli.

EXPERIENCE AND BACKGROUND

Training in Molecular Biology, Molecular Entomology and Insect Transgenesis acquired in Italian (University Federico II; CNR, Arco Felice, Naples) and European (IMBB, Heraklion; EMBL, Heidelberg) research institutions. From 1996 to 2002 is member of the "Malaria" group headed by Prof. Mario Coluzzi (Sapienza University, Rome) where he gets training in Medical Entomology and Malariology. From 2002 to 2011 is Researcher at University Federico II (Naples) where is responsible of the "*Anopheles* Molecular Biology" laboratory at the Department of Structural and Functional Biology, Monte S. Angelo Campus. From 30/12/2011 is Researcher and then Associate Professor of Molecular Biology at Sapienza University of Rome, Department of Public Health and Infectious Diseases, Division of Parasitology.

SCIENTIFIC INTERESTS

Molecular Biology of culicids of publich health importance, with special emphasis on the malaria vector *Anopheles gambiae* and the arboviral vectors *Aedes albopictus* and *Aedes aegypti*. Saliva of culicid vectors and its role in hematophagy, pathogen transmission and pathogen-vector-host interactions. Molecular Biology of arthropod disease vectors. Non-coding RNAs. Malaria and arboviral diseases transmitted by culicids. Vector salivary proteins as epidemiological tools for the evaluation of human exposure to vector bites. Genetic manipulation of insect of medical and economical relevance.

BIBLIOMETRIC INDICES

Author of 63 full-length publications, mostly in peer-reviewed international journals (total Impact Factor 243.7) and of over 100 abstracts presented at national or international Conferences. Bibliometric indexes at September 2020 (Scopus): documents 57; h index 27; total citation 2400; citation/document 42.10.

ACTIVITY AS REVIEWER

Served as reviewer for several International scientific journals as: American Journal of Tropical Medicine and Hygiene, BMC Biology, BMC Molecular Biology, BMC Genomics, BMC Veterinary Research, Epidemiology and Infection, Experimental Parasitology, FEBS Letters, Gene, Insect Biochemistry and Molecular Biology, Insect Molecular Biology, Journal of Insect Physiology, Journal of Molecular Recognition, Journal of Infectious Diseases, Malaria Journal, Medical and Veterinary Entomology, Microbes & Infection, Molecular and Biochemical Parasitology, Parassitologia, Parasite Immunology, PloS Neglected Tropical Diseases, PloS One, PLoS Pathogens, Proceeding of the Natural Academy of Science USA, Trends in Parasitology, Vector-Borne and Zoonotic Diseases.

Served as reviewer for the following international funding agencies:

- Pasteur Institute (2005, Call for proposals on Parasitic Diseases; 2019, Programmes Transversaux de Recherche);
- French National Research Agency (ANR, Calls MIE 2008 e 2009, Call Non-Thematic Programme 2010, 2011 e 2012);
- European Union (FP7-HEALTH-2010-single-stage; FP7-PEOPLE-COFUND, Project I-MOVE 267232, 2012; H2020 Marie Skłodowska-Curie COFUND, LEaDing Fellows Postdoc project, 2018; Infravec2 Selection Panel member, 2018-2019).

Received additional requests that could not be accepted (conflict of interest or overlapping commitments) from MIUR (Call FIRB Programme "Futuro in Ricerca" 2010), from the European Research Council (ERC, Starting Grants 2010), from the German Research Foundation (DFG, 2011), from Czech Science Foundation (2011), from the Romanian National Research Council (CNCS, 2012), from the Executive Agency for Higher Education, Research, Development and Innovation Funding (Romania 2016 funding call "Experimental Demonstrative Project").

MEMBERSHIPS and/or PARTNERSHIPS

- Management Committee COST 857 *Apicomplexan Biology in the post-Genomic Era* (2003-2005).
- Network of Excellence FP6 BioMalPar *Biology and Pathology of the Malaria Parasite* (2004-2009).
- Italian Malaria Network/Centro Interuniversitario di Ricerche sulla Malaria (CIRM-ISS, from 2007)
- Network FP7 Infravec, *Research capacity for the implementation of genetic control of mosquitoes* (2009-2014, http://www.infravec.eu/).

- Network of Excellence FP7 EVIMalaR "European Virtual Institute for Malaria Research" (2009-2015, http://www.evimalar.org).
- Italian Society of Parasitology (SOIPA).
- Editorial Board member, Tropical Medicine and Infectious Diseases.
- Review Editor (Vector Biology section), Frontiers Tropical Diseases.

SCIENTIFIC ACTIVITY
FROM 1996 TO DATE

In the last twenty years the research interests were mainly focused on the salivary glands of the Afrotropical malaria vector *Anopheles gambiae* and of the arboviral vectors *Ae. albopictus* ed *Ae. aegypti*. Saliva of hematophagous insects represents an attractive research target for its role in pathogen-vector-host interactions. Indeed, the salivary secretions of blood feeding insects, in virtue of their biochemical-pharmacological properties, are able to affect host hemostatic, inflammatory and immune responses. More specifically the research work has been focused on the following aspects:

(a) **TRANSCRIPTOMIC AND GENOMIC STUDIES ON THE SALIVARY REPERTOIRES OF ANOPHELINE AND CULICINE MOSQUITOES**. Initially a selective cloning strategy (Signal Sequence Trap) allowed for the isolation of the first *An. gambiae* salivary gland-specific genes (Proc Natl Acad Sci USA 1999, FEBS Letters 2002). Afterwards, transcriptome analyses allowed to characterize the salivary repertoires of *An. gambiae* (J Exp Biol 2005, Insect Biochem Mol Biol 2006), *Aedes aegypti* (BMC Genomics 2007, PloS ONE 2016), *Aedes albopictus* (Insect Biochem Mol Biol 2007) and more recently of Amazonian anophelines (BMC Genomics 2019). In addition, the genome sequence of 16 *Anopheles* species and of *Ae. albopictus* allowed to get genomics and evolutionary insights (Insect Mol Biol 2014, Science 2015, Pathog Glob Health 2015, BMC Genomics 2017). Moreover, comparative analyses allowed for the classification of the main families of salivary proteins of hematophagous insects and the identification of *Anopheles*- and *Aedes*-specific salivary proteins (Adv Insect Physiol 2009, Insect Biochem Mol Biol 2010, Parassitologia, 2006, Curr Opin Insect Sci 2018).

(b) **IDENTIFICATION OF TISSUE-SPECIFIC REGULATORY ELEMENTS**. Promoter regions able to confer sex- stage- and tissue-specific expression in the salivary glands of adult females have been analyzed in transgenic *Drosophila*, *Anopheles stephensi* and *An. gambiae* (J Biol Chem 2000, Insect Mol Biol 2005, BMC Research Notes, 2009).

(c) **FUNCTIONAL ANALYSIS OF SALIVARY PROTEINS**. The function of a large number of Culicid salivary proteins identified so far is presently completely unknown. We are proceeding to functional analysis by expression of recombinant salivary proteins and/or by salivary gland gene silencing through RNAi. Among the *An. gambiae* salivary proteins characterized are the platelet inhibitor apyrase (J Biol Chem 2000), the D7-related gene cluster (Insect Mol Biol 2002), the gSG6 protein (Insect Biochem Mol Biol 2009), the thrombin inhibitor cE5 (Insect Biochem Mol Biol 2012, J Biol Chem 2017, Peptide Science 2018).

(d) **SALIVARY PROTEINS AS MARKERS OF EXPOSURE TO MOSQUITO BITES**. We have studied the human antibody response to the *Anopheles*-specific salivary proteins gSG6 and cE5 and set up ELISA assays to evaluate their possible use as marker of exposure to bites of anopheline mosquitoes and, therefore, as potential indicators of malaria risk (PloS ONE 2008, PloS ONE 2011, Malaria Journal 2011, PloS ONE 2012, Parasite Immunol 2013, PloS ONE 2014, Parasite & Vectors 2014, Microbes & Infection 2015, Sci Rep 2016, Parasite & Vectors 2017). We are currently expanding the methodology to *Aedes* mosquitoes, specifically to *Ae. albopictus* and *Ae. aegypti*.

(e) **CHARACTERIZATION OF THE Ae. albopictus OLFACTORY REPERTOIRE**. The transcriptome analysis of the *Ae. albopictus* olfactory repertoire has been recently completed leading to the

identification of the four main olfactory gene families: Odorant Receptors (ORs), Odorant Binding Proteins (OBPs), Gustatory Receptors (GRs) ed Ionotropic Receptors (IRs) (BMC Genomics 2017).
(f) **ANALYSIS OF miRNAs FROM SALIVA AND SALIVARY GLANDS OF *An. coluzzii***. We recently analyzed by small RNAseq saliva and salivary glands from *An. coluzzii* adult females and the main findings were: (i) asymmetric distribution of miRNAs between salivary glands and saliva, which suggests that specific miRNAs are selectively conveyed toward the secretory pathway and saliva; (ii) eleven of the most abundant saliva miRNA mimic human endogenous miRNAs targeting host genes involved in vertebrate inflammatory and immune responses (Sci Rep 2019). Analysis in *Aedes* mosquito is in progress.
The research work described above has been part of some EU-funded research networks:
1. TMR Network "Host-Parasite Interactions: Molecular Aspects of Infection and Immunity in Diptera" (1996-2000). Coordinator Prof. F.C. Kafatos (EMBL, Heidelberg, Gemany).
2. RTN Network "Insect Innate Immunity and Critical Stages of Malaria-Mosquito Interaction" (2000-2004). Coordinator Prof. J. Hoffmann (CNRS, Strasbourg, France).
3. Network of excellence BioMalPar "Biology and Pathology of the Malaria Parasite" (2004-2009) (http://www.biomalpar.org, http://www.biomalpar.org/partners_rev.html). Coordinator Dr. A. Scherf (Pasteur Institute, Paris, France).
4. Network of excellence EVIMalaR "European Virtual Institute for Malaria Research" (2009-2015). Coordinator Prof. A. Waters (University of Glasgow, UK) (http://www.evimalar.org)
5. Infravec, "Research capacity for the implementation of genetic control of mosquitoes"(2009-2013). Coordinator Prof. A. Crisanti (Imperial College, London, UK) (http://www.infravec.eu/).

MAIN INTERNATIONAL COLLABORATIONS:
- Dr. C. Bourgouin, Institute Pasteur Paris, France.
- Prof. T. Bousema, Radboud University Medical Centre, Nijmegen, The Netherlands.
- Prof. A. Crisanti, Imperial College, London, UK.
- Prof. C. Drakeley, London School of Hygiene and Tropical Medicine, London, UK.
- Dr. Anna-Bella Failloux, Arboviruses and Insect Vectors, Institute Pasteur Paris, France
- Prof. A. James, Univ. of California, Irvine.
- Prof. A. Kaneko, Karolinska Institute, Stockholm, Sweden.
- Dr. M. Kotsyfakis, Institute of Parasitology, Academy of Sciences of Czech Republic.
- Prof. C. Louis, Inst. of Molecular Biology & Biotechnology, Heraklion, Crete, Greece.
- Dr. G. Lycett, Liverpool School of Tropical Medicine, Liverpool, UK.
- Dr. I. Nebiè, CNRFP, Ouagadougou, Burkina Faso.
- Dr F. Remoue, UR024-Epidémiologie et Prévention, IRD, Dakar, Senegal.
- Dr. J.M.C. Ribeiro, Laboratory of Malaria and Vector Research, NIAID-NIH, MD, USA.
- Dr. S.B. Sirima, CNRFP, Ouagadougou, Burkina Faso.
- Dr. C. Struchiner, Fundacao Oswaldo Cruz, Rio de Janeiro, Brazil.
- Prof. M. Troye Blomberg, Stockholm University, Stockholm, Sweden.

NATIONAL COLLABORATION AND PARTICIPATION TO OTHER RESEARCH PROJECTS
- Prof. P Dimitri (Dept. of Biology and Biotechnology, Sapienza, Rome). Transposons and heterochromatin in *D. melanogaster* (Proc Natl Acad Sci USA 1997; Mol Biol Evol 2003).
- Prof. D Modiano (Dept. of Public Health and Infectious Diseases, Sapienza, Rome). Analysis of the IL-4 promoter in African population with different susceptibility to malaria (Genes and Immunity, 2001, Acta Tropica, 2004). Salivary proteins as epidemiological markers of human exposure to malaria vectors (PloS ONE 2011, 2012 e 2014, Malaria Journal 2011, Parasite & Vectors 2014).
- Prof. M Coluzzi (Dept. of Public Health and Infectious Diseases, Sapienza, Rome) and Prof. V Ascoli (Dept. Experimental Medicine, Sapienza, Rome). Role of hematophagous arthropod bites in

the transmission of HHV8 and expression of Kaposi' sarcoma (Rend. Fis. Acc. Lincei, 2002, Parassitologia 2002, Tumori 2003).
- Prof. Menico Rizzi (DiSCAFF, Univ. Piemonte Orientale, Novara). Biochemical and structural characterization of *An. gambiae* enzymes involved in *Plasmodium* gametogenesis (FEBS J 2005, Proc Natl Acad Sci USA 2006, Insect Biochem Mol Biol 2008).
- Dott. Marta Ponzi (Dept. Of Infectious, Parasitic and Immuno-mediated Diseases, Istituto Superiore di Sanità, Rome). Study of the *An. gambiae* gSG6 and cE5 salivary proteins (Insect Biochem Mol Biol, 2009 e 2012).
- Dr. Marco Salvemini (Dept. Biological Sciences, Federico II, Napoli). Sex determining genes in *An. gambiae* and *Ae. aegypti* (BMC Evol Biol 2011) and analysis of the genome and of the olfactory transcriptome of *Ae. albopictus* (Pathog Glob Health 2015, BMC Genomics 2017).

27 JANUARY 2004
PhD in Cellular Biology, University of Pavia. Thesis: "The D7-related genes of the malaria vector *Anopheles gambiae*: molecular characterization, promoter analysis and possibile blood feeding role."

JULY 1990 - DECEMBER 1995 (IMBB, supervisor Prof. C. Savakis).
During the training period at IMBB (Institute of Molecular Biology & Biotechnology, Heraklion, Crete, Greece) the research work has been focused on the development of a genetic transformation system for insects of medical and agricultural importance using the *D. melanogaster* P element, the site-specific recombination system FLP-FRT from *Saccharomyces cerevisiae* (New Biol 1992) and the transposable element Minos from *Drosophila hydei*. Minos was successfully used to transform both *D. melanogaster* (Proc Natl Acad Sci USA 1995) and the medfly *Ceratitis capitata* (Science 1995). Analysis of the molecular mechanisms of Minos transposition in *D. melanogaster* (Genetics 1997) and its distribution in the genus *Drosophila* (Genetica 2000).

JULY 1989 - JUNE 1990 (CNR, supervisor Dr. L. De Petrocellis).
As CNR fellow (Arco Felice, Napoli) studies the effect of 5-azacytidine treatment on head regeneration in *Hydra vulgaris* pointing out the induction of several novel mRNAs during tentacle regeneration (unpublished). Constructs a cDNA library from regenerating *Hydra* and collaborates to studies on the effect of diacylglycerol on tentacle regeneration in *Hydra vulgaris* (Comp Biochem Physiol 1991).

SEPTEMBER 1986 - JUNE 1989 (Federico II University, supervisor Prof. L. Fucci).
Post-degree training in the Molecular Biology laboratory (Dept of Genetics and Molecular Biology, Federico II University, Naples). Participates to studies on the hemoglobin switch in chicken embryos.

23 JULY 1986
Degree in Biological Sciences. Thesis in Botany: "Proline accumulation in response to water and salt stress: role and possible association to stress resistance." Grade: 110/110. Tutor: Prof. A Virzo De Santo.

RESEARCH FUNDS AS TEAM-LEADER OR PRINCIPAL INVESTIGATOR

- 1996-2000. EU FP4 TMR Research Network "Insect-Parasite interaction: molecular aspects of infection and immunity in Diptera" (FMRXCT96-0017). Coordinator: Prof. FC Kafatos (EMBL, Heidelberg). Amount: 241.200 ECU/EURO. Duration: 48 months. Role: Team-leader, PI: Prof. M. Coluzzi.
- 1998-1999. EU Return Grant "Trapping cDNAs encoding secreted and membrane proteins from the *Anopheles gambiae* salivary glands" (BIO4CT98-5020). Amount: 39.576 ECU/EURO. Duration: 12 months. Role: PI.
- 2000-2002. WHO/TDR "Isolation and molecular characterization of salivary gland-specific promoters from the African malaria vector *Anopheles gambiae*" (ID 980619). Amount: 120.000 US$. Duration: 36 months. Role: Team-leader, PI: Prof. M. Coluzzi.
- 2000-2004. EU FP5 Research Training Network "Insect innate immunity and the critical stages of malaria-mosquito interactions" (HPRN-CT-2000-00080). Coordinator: Prof. J. Hoffmann (CNRS, Strasbourg). Amount: 200.000 ECU/EURO. Duration: 48 months. Role: Team-leader, PI: Prof. M. Coluzzi.
- 2003-2005. PRIN 2003 "Caratterizzazione biologica, genetica e molecolare di popolazioni di laboratorio e di campo di Anofelini vettori di malaria" (2003062554_003). Coordinator: Prof. M. Coluzzi (Sapienza, Roma). Duration: 24 months. Role: Team leader (Federico II, Napoli), PI of Sapienza Research Unit Prof. V. Petrarca.
- 2004-2009. EU FP6 Network of Excellence "Biology and Pathology of Malaria Parasite" (BioMalPar) (LSHP-CT-2004-503578). Coordinator: Dr. A. Scherf (Pasteur Institute, Paris, France). Amount: 200.000 EURO. Duration: 60 months. Role: PI at Univ. Federico II (Napoli) along with Prof. Mario Coluzzi (Sapienza, Roma).
- 2007-2009. Fondazione Compagnia di San Paolo (Torino), Network Italiano sulla Malaria "Malaria da Plasmodium falciparum: Aspetti Molecolari, Fisiopatologici, Farmacologici, Genetici ed Epidemiologici delle Interazioni fra Parassita, Vettore ed Ospite Umano". Coordinator: Prof. Paolo Arese (Università di Torino). Amount: 60.000 EURO. Duration: 34 months. Role: PI.
- 2009-2013. EU FP7 Infrastracture "Research capacity for the implementation of genetic control of mosquitoes" (228421). Coordinator: Prof. Andrea Crisanti (Imperial College, London). Amount: 126.000 EURO. Duration: 48 months. Role: PI.
- 2012. Finanziamenti di Ateneo 2012 "Toward a functional analysis of the salivary repertoires of the mosquito vectors *Anopheles gambiae* and *Aedes albopictus*" (C26A12SLP3). Amount: 3500 EURO. Duration: 12 months. Role: PI.
- 2013-2016. PRIN 2010-2011 "La risposta infiammatoria della cute ad agenti infettivi e danno tissutale: analisi trascrittomica, post-trascrittomica e studi funzionali a livello della singola cellula" (2010C2LKKJ_004). Coordinator: Prof. Barbara Camilloni (University of Perugia). Amount: 135000 EURO. Duration 36 months. Role: Team-leader, PI: Prof. D. Modiano.
- 2014. Finanziamenti di Ateneo 2014 "Exploring the olfactory repertoire of the tiger mosquito *Aedes albopictus*" (C26A14AKKH). Amount: 3000 EURO. Duration: 12 months. Role: PI.
- 2015. Finanziamenti di Ateneo 2015 "Characterization of the salivary microRNA repertoire of the African malaria vector *Anopheles gambiae*" (C26A159YJT). Amount: 4000 EURO. Duration: 12 months. Role: PI.
- 2016. Finanziamenti di Ateneo 2016 "Transcriptome profiling of the immune repertoire of the tiger mosquito *Aedes albopictus*, a competent vector for several arboviruses". Amount: 10000 EURO. Duration: 12 months. Role: Participant. PI: Prof. F. Lombardo.
- 2016. Finanziamenti di Ateneo for Visiting Professors 2016. Research Visit of Dr. Josè M.C. Ribeiro (Head Laboratory of Malaria and Vector Research, NIAID-NIH, Rockville MD USA). Duration: 30 days. Amount: 5000 EURO. Role: PI.
- 2017. FFABR 2017 Finanziamento delle attività base di ricerca. Amount: 3000 EURO

- 2017-2020. PRIN 2015 "Symbiosis as tool for Malaria epidemiology and control" (2015JXC3JF_002). Coordinator: Prof. Guido Favia (University of Camerino). Amount: 173333 EURO. Duration: 36 months. Role: Team-leader, PI: Prof. D. Modiano.
- 2018. Finanziamenti di Ateneo 2018 "The host-parasite interface: characterization of non-coding RNAs in exosomes of anisakid nematodes of human health concern". Amount: 10000 EURO + 23000 EURO (Assegno di Ricerca). Duration: 12 months. Role: Participant. PI: Prof. S. D'Amelio.
- 2018-2021. Ministry of Defence, Piano Nazionale della Ricerca Militare E.F. 2017 "Sistema integrato per la sorveglianza dei patogeni trasmessi da vettori (SENSOR)". Amount: 442250 EURO. Duration: 36 months. Role: Team-leader, PI: Dott. M. Pombi.
- 2019. Finanziamenti di Ateneo 2019 "Micro-RNAs from mosquito saliva:additional players in vector-host-pathogen interactions?". Amount: 10740 EURO. Duration: 12 months. Role: PI.

TEACHING ACTIVITY

- From 2002 to 2011 teaches in the Master Degree in Biology (Federico II University, Naples): Molecular Biology I (2002/2003); Molecular Biology II (2004/2005); Advanced Molecular Biology (2005/2009); Applied Molecular Biology (2005/2009); Molecular Biology and Bioinformatics (2009/2010, 2011/2012).
- From 2012/2013 up to date teaches:
  (i) Basics of Biology - Applied Biology, Degree "B" in "Tecniche della Prevenzione nell'Ambiente e nei Luoghi di Lavoro" (Polo di Rieti, Sapienza University, Rome);
  (ii) Biochemical Basis of Diagnostic Sciences - Molecular Biology, Degree "F" in "Tecniche di Laboratorio Biomedico" (Polo di Rieti, Sapienza University, Rome).
- From 2018/2019 teaches Molecular Biology Master Degree in Pharmacy, Sapienza University, Rome.
- Other:
- Laboratory of MOLECULAR BIOLOGY (2002-2004) and BIOLOGY II – MOLECULAR BIOLOGY (2004-2005, 2006-2007) at Master Degree in General and Applied Biology, Federico II University, Naples.
- SEMINARS ON EVOLUTIONARY BIOLOGY, Master Degree in General and Applied Biology, Federico II University, Naples. (2003-2004).
- Lecture in the framework of PhD in ADVANCED BIOLOGY, Federico II University, Naples (2006-2011).
- Lecture in the framework of SCUOLA DI SPECIALIZZAZIONE IN MICROBIOLOGIA E VIROLOGIA, Sapienza University, Rome (1999-2001, 2011-2014).
- Lectures in VIROLOGY AND MOLECULAR PARASITOLOGY (teacher: Prof.ssa A. della Torre), Master Degree in Medical Biotechnologies, Sapienza" University, Rome (2013-2017).

STUDENT SUPERVISION AND TRAINING

Supervised several students in the preparation of their Bachelor or Master thesis (University Federico II Naples, Sapienza University of Rome), 1 master student from University Paris Sud (Paris, France), 6 PhD students from Sapienza University of Rome and 3 postdoctoral fellows. Co-supervised 1 PhD student in the framework of the EU-funded EVIMalaR's International PhD Programme (PhD student head office University of Montpellier, France).

PhD THESIS REVIEWER AND COMMITTEE MEMBERSHIP

University of Perugia, PhD Programme in "Patogenesi Molecolare, Immunologia e Controllo degli Agenti Trasmissibili che Causano le Principali Malattie Associate alla Povertà (Malaria, AIDS e Tubercolosi)"

- 2016, XXVIII cycle. PhD candidate Carla Siniscalchi: "Development of gene drive systems based on TALENs and ZFNs as alternatives to HEGs for vector control"

Role: reviewer and committee member

- 2017, XXVIII cycle. PhD candidate Alessi Cagnetti: "Characterizing and engineering of the *An. gambiae* Y chromosome for vector control"

Role: reviewer and committee member

University of Perugia, PhD Programme in "Systems Biology in Immunity and Infectious Pathologies"

- 2017, XXX cycle. PhD candidate Francesco Papa: "Hematophagous lifestyle drives rapid evolution of female biased genes in the genus of *Anopheles* malaria mosquitoes"

Role: reviewer

- 2017, XXX cycle. PhD candidate Chrysanthi Taxiarchi: "Cellular resolution of the transcriptional profile of mosquito spermatogenesis and its potential application for vector control"

Role: reviewer

- 2018, XXXI cycle. PhD candidate Anastasia Accoti: "Symbiotic based study for advance knowledge and control of mosquito-borne diseases"

Role: reviewer

Charles University, Faculty of Science, Prague (CZ) PhD Programme in "Parasitology"

- 2019. PhD candidate Mgr. Petra Cikrtova: "Characterization and antigenic properties of salivary yellow-related proteins in phlebotomine sand flies"

Role: reviewer and committee member

PUBLICATIONS

1) Geraci G, **Arcà B**, Cirotto C, Fucci L. (1991). The hemoglobins in the ontogeny of the chicken embryo. In *Macromolecules in the functioning cell*. Proceedings of the 6th Soviet-Italian Symposium (A.A. Bayev, A.D. Mirzabekov, M.Y.Timofeeva, eds). Pushchino 1991, **6**: 106-125.
2) De Petrocellis L, Di Marzo V, **Arcà B**, Gavagnin M, Minei R, Cimino G. (1991). Effect of diterpenoidic diacylglycerols on tentacle regeneration. *Compar Biochem and Physiol* **100C**, 3: 603-607.
3) Konsolaki M, Sanicola M, Kozlova T, **Arcà B**, Savakis C, Gelbart WM, Kafatos FC. (1992). FLP-mediated Intermolecular recombination in the Cytoplasm of Drosophila embryos. *New Biol* **4**: 551-557.
4) Loukeris TG, **Arcà B**,Livadaras I, Dialektaki G, Savakis C. (1995). Introduction of the transposable element *Minos* into the germline of *Drosophila melanogaster*. *Proc Natl Acad Sci* USA **92**: 9485-9489. [abstract]
5) Loukeris TG, Livadaras I, **Arcà B**, Zabalou S, Savakis C. (1995). Gene transfer into the Medfly, *Ceratitis capitata*, with a *Drosophila hydei* transposable element. *Science* **270**: 2002-2005. [abstract]
6) **Arcà B**, Savakis C. (1997). The polymerase chain reaction (PCR) and RT-PCR. In *The molecular biology of insect disease vectors: a method manual*. (J.M. Crampton , C.B. Beard and C. Louis, eds), pp. 244-260. Chapman & Hall, London. ISBN 978-94-010-7185-7.
7) **Arcà B**, Zabalou S, Loukeris TG, Savakis C. (1997) Mobilization of a *Minos* transposon in *Drosophila melanogaster* chromosomes and chromatid repair by heteroduplex formation. *Genetics* **145**, 267-279. [abstract]
8) Dimitri P, **Arcà B**, Berghella L, Mei E. (1997). Genetic instability of heterochromatin following transposition of the Line-like *I factor* in *Drosophila melanogaster*. *Proc Natl Acad Sci* USA **94**: 8052-8057. [abstract]
9) **Arcà B**, Lombardo F, Capurro M, della Torre A, Dimopoulos G, James AA, Coluzzi M (1999) Trapping cDNAs encoding secreted proteins from the salivary glands of the malaria vector *Anopheles gambiae*. *Proc Natl Acad Sci* USA **96**: 1516-1521. [abstract]
10) **Arcà B**, Lombardo F, Capurro M, della Torre A, Spanos L, Dimopoulos G, Louis C, James AA, Coluzzi M. (1999) Salivary gland-specific gene expression in the malaria vector *Anopheles gambiae*. In *The Malaria Challenge after One Hundred Years of Malariology - Parassitologia* **41**: 483-487.
11) Lombardo F, Di Cristina M, Spanos L, Louis C, Coluzzi M, **Arcà B.** (2000) Promoter sequences of the putative *Anopheles gambiae apyrase* confer salivary gland expression in *Drosophila melanogaster. J Biol Chem* **275**: 23861 23868. [abstract]
12) **Arcà B**, Savakis C. (2000) Distribution of the transposable element *Minos* in the genus *Drosophila*. *Genetica* **108**, 263-267. [abstract]
13) **Arcà B**, Lombardo F, Lanfrancotti A, Coluzzi M. (2001) Malaria: prospettive biotecnologiche di lotta al vettore. *Atti dell'Accademia di Medicina di Torino* 2001, 226-239.
14) Luoni G, Verra F, **Arcà B**, Sirima BS, Troye-Blomberg M, Coluzzi M, Kwiatowski D, Modiano D. (2001) Antimalarial antibody levels and IL4 polymorphism in the Fulani of West Africa. *Genes and Immunity* **2**: 411-414. [abstract]
15) **Arcà B**, Lombardo F, Lanfrancotti A, Spanos L, Veneri M, Louis C, Coluzzi M. (2002) A cluster of four *D7-related* genes is expressed in the salivary glands of the african malaria vector *Anopheles gambiae*. *Insect Mol Biol* **11**: 47-55. [abstract]
16) Lanfrancotti A, Lombardo F, Santolamazza F, Veneri M, Castrignanò T, Coluzzi M, **Arcà B.** (2002) Novel cDNAs encoding salivary proteins from the malaria vector *Anopheles gambiae*. *FEBS letters* **517**: 67-71. [abstract]

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62) Buezo Montero S, Gabrieli P, Severini F, Picci L, Di Luca M, Forneris F, Facchinelli L, Ponzi M, Lombardo F, **Arcà B**. (2019). Analysis in a murine model points to IgG responses against the 34k2 salivary proteins from *Aedes albopictus* and *Aedes aegypti* as novel promising candidate markers of host exposure to *Aedes* mosquitoes. *PLoS Negl Trop Dis.* **13**(10):e0007806. [abstract]
63) Buezo Montero S, Gabrieli P, Montarsi F, Borean A, Capelli S, De Silvestro G, Forneris F, Pombi M, Breda A, Capelli G, **Arcà B**. (2020). IgG antibody responses to the *Aedes albopictus* 34k2 salivary protein as novel candidate markers of human exposure to the tiger mosquitoes. *Front Cell Infect Microbiol.* **10**:337. [abstract]

INVITED SEMINARS AND ORAL PRESENTATIONS

1) "Trasformazione genetica di *Drosophila melanogaster* mediante l'elemento trasponibile *Minos* di *Drosophila hydei*: " Stazione Zoologica Anton Dohrn, Napoli, 23 Settembre 1993. **Invited seminar** Prof. R. Di Lauro.
2) "Molecular Characterization of *Minos*-mediated Germline Transformants in *D.melanogaster*." XXXIX Congresso della Associazione Genetica Italiana. Senigallia (Ancona), 29 Settembre – 1 October 1993.
3) "Mobilizzazione dell'elemento trasponibile *Minos* in *Drosophila melanogaster*: meccanismi molecolari di trasposizione e prospettive per la trasformazione genetica di non-drosofilidi." Dipartimento di Biologia Animale, Università di Siena, 20 Dicembre 1994. **Invited seminar** Prof. R. Dallai.
4) "Application of the Signal Sequence Trap to the salivary glands of the African malaria vector *Anopheles gambiae".* European Molecular Biology Laboratory, Heidelberg - Germany, 8 Dicembre 1997. **Invited seminar** Prof. F.C. Kafatos.
5) "Trapping cDNAs coding for receptors and secreted proteins from the salivary glands of the malaria vector *Anopheles gambiae*." XX Congresso della Società Italiana di Parassitologia. Roma, 17-20 Giugno 1998.
6) "Salivary gland-specific gene expression in the malaria vector *Anopheles gambiae*." Malariology Centenary Conference: *The Malaria Challenge after One Hundred Years of Malariology* . Roma, Accademia dei Lincei , 16-19 Novembre 1998. **Invited speaker.**
7) "Identificazione di geni specificamente espressi nelle ghiandole salivari del vettore di malaria *Anopheles gambiae*." Dipartimento di Genetica e Biologia Molecolare, Università di Roma "La Sapienza", 21 Marzo 2000. **Invited seminar**, Prof. P. Dimitri.
8) "Malaria: prospettive biotecnologiche di lotta al vettore." Accademia Medica di Torino – 13 Aprile 2000. Tavola rotonda su: "*La ricerca malariologica in Italia oggi. Risultati e prospettive.*" **Invited speaker.**
9) "A cluster of *D7-related* genes is expressed in the salivary glands of the African malaria vector *Anopheles gambiae*." XXI Congresso della Società Italiana di Parassitologia. Padova-Legnaro, 20-24 Giugno 2000.
10) "A molecular study on the salivary glands of the malaria vector *Anopheles gambiae*: isolation of cDNAs encoding secreted proteins by the Signal Sequence Trap technique." Applied Genetics Department, Université Libre de Bruxelles, 14 Settembre 2000. **Invited seminar**, Prof. A. Bollen.
11) "Toward a more detailed understanding of the salivary glands of the malaria vector Anopheles gambiae". Institute Pasteur, Parigi, 22 Marzo 2002. **Invited seminar**, Dr. Paul Brey.
12) "Toward a better understanding of composition and functions of the salivary secretions of the African malaria mosquito *Anopheles gambiae*". XXII Congresso della Società Italiana di Parassitologia. Grugliasco (Torino), 11-14 Giugno 2002.
13) "The *Anopheles gambiae D7-related* are a cluster of salivary genes involved in blood feeding and belong to the insect odorant-binding protein superfamily". 4° Convegno Federazione Italiana Scienze della Vita, Riva del Garda (TN), 20-23 Settembrer 2002.
14) "Unraveling the complexity of the *An. gambiae* salivary secretions". Giornate scientifiche dell'Istituto Pasteur-Fondazione Cenci Bolognetti "*Microbi e Parassiti tra Biologia di Base e Applicazione*", Roma 4-5 Novembre 2002. **Invited speaker**
15) "Toward the understanding of function and complexity of the *Anopheles gambiae* salivary glands." EMBO workshop on: "*Molecular and population biology of mosquitoes*", 13-19 August 2003, Kolymbari, Crete, Greece.
16) "Toward a functional analysis of salivary proteins from the African malaria vector *Anopheles gambiae*: a work in progress." XXIII Congresso della Società Italiana di Parassitologia. Vietri sul Mare (Salerno) 9-12 Giugno 2004.

17) "A cluster of Antigen 5 family members expressed in the salivary glands of the African malaria vector *Anopheles gambiae*." XXIII Congresso della Società Italiana di Parassitologia. Vietri sul Mare (Salerno) 9-12 Giugno 2004.
18) "The *Anopheles gambiae* salivary glands: transcriptome analysis and tissue-specific promoters." First Annual BioMalPar Conference on the Biology and Pathology of the Malaria Parasite. 2-4 March, 2005, EMBL, Heidelberg, Germany.
19) "The *Anopheles gambiae* salivary transcriptome: toward a functional analysis". EMBO workshop on: "*Molecular and population biology of mosquitoes and other disease vectors*, 24-31 July 2005, Kolymbari, Crete, Greece.
20) "Le ghiandole salivari del vettore di malaria *Anopheles gambiae*: verso un'analisi funzionale". Dottorato di Ricerca in Biologia Cellulare e Molecolare, Università dell'Aquila. 9 Marzo 2006. **Invited seminar**, Prof. M. Giorgi.
21) "At the interface between parasite and host: the salivary glands of the malaria vector *Anopheles gambiae*". Giornate scientifiche dell'Istituto Pasteur-Fondazione Cenci Bolognetti.: "*Hosts, Symbionts and Parasites: Molecular and Pharmacological Approaches",* Roma, 26-27 Ottobre 2006. **Invited speaker**
22) "The mosquito salivary glands: Transcriptome, RNAi and Salivary antigens." BioMalPar Cluster 3&4 Meeting, St. Catherine's College, 14-15 December 2006, Oxford, UK.
23) *"*gSG6, an Anopheles protein with a role in blood feeding." Third International Meeting on "*Molecular and population biology of mosquitoes and other disease vectors*" 13-20 July, 2007 – Kolymbari, Crete, Greece
24) "Contribution of Molecular Biology to Medical Entomology and future perspectives". Third Joint Workshop on "*History of Medical Entomology"* Accademia Nazionale dei Lincei, 11-12 October 2007 – Rome, Italy. **Invited speaker**
25) *"Anopheles gambiae* salivary proteins: markers of exposure to bites of anopheline mosquitoes?" BioMalPar Cluster 3 & 4 Meeting 5-7 December, 2007 - Mt. Ste Odile, France
26) " Humoral response to mosquito salivary proteins as serological indicator of exposure to disease vectors: IgG response to the *Anopheles gambiae* gSG6 and malaria". EMBO Workshop on "*Molecular and population biology of mosquitoes and other disease vectors*, 19-26 July 2009, Kolymbari, Crete, Greece.
27) "The *Anopheles gambiae* gSG6 salivary protein: a serological marker of exposure to African malaria vectors". International Conference EDEN 2010 *Emerging Vector-borne Diseases in a Changing European Environment* 10-12 May 2010, Montpellier, France.
28) "The anopheline gSG6 salivary protein: toward the development of a serological marker of exposure to African malaria vectors" Laboratory of Malaria and Vector Reasearch – NIAID-NIH, Rockville, MD (USA) July 1st 2010. **Invited seminar** Dr. Jose Ribeiro.
29) "*Anopheles gambiae* salivary proteins as serological markers of exposure to Afrotropical malaria vectors" EVIMalaR Cluster 3 Workshop, 25-27 October 2010, Stockholm, Sweden.
30) "*Anopheles* salivary proteins: useful tools for malaria epidemiological studies". *Fightmal Dissemination Workshop* 5 January 2011, London School of Hygiene and Tropical Medicine, London, UK. **Invited speaker**
31) "*Anopheles gambiae* salivary glands:parasite-vector-host interactions and implications for malariology". *Italian Malaria Network – Il contributo della ricerca italiana alla lotta contro la Malaria*. 11 January 2011, Istituto Superiore di Sanità, Rome, Italy. **Invited speaker**
32) "*Anopheles* salivary antigens as markers of human exposure to malaria vectors". IV Annual Meeting COST Action BM0802 *Life or Death of Protozoan Parasites* – II Annual meeting Italian Malaria Network (IMN) CIRM-Centro Universitario Ricerca sulla Malaria. 19-21 January 2012, Università di Milano, Milano, Italy. **Invited speaker**

33) "Function and antigenicity of mosquito salivary proteins". *XXIV International Congress of Entomology*. 19-25 August 2012, Daegu, Korea. Insect Immunology, Physiology and Neurobiology: Symposium on Salivary proteins. **Invited speaker**
34) **"***Anopheles gambiae* salivary proteins as a tool to evaluate spatial and temporal variation of human exposure to malaria vectors." EVIMalaR Cluster 3 Meeting, 3-5 December 2012, Rome, Italy.
35) **"**Positive selection drives accelerated evolution of mosquito salivary genes associated with blood feeding". XXVIII Congresso Nazionale della Società Italiana di Parassitologia (SoIPa). 24-27 June 2014, Roma, Italy.
36) "Differential antibody response to the *Anopheles gambiae* gSG6 and cE5 salivary proteins in individuals naturally exposed to bites of malaria vectors". EMBO Conference on "*Molecular and population biology of mosquitoes and other disease vectors*, 24-29 July 2015, Kolymbari, Crete, Greece.
37) "The salivary repertoires of anopheline mosquitoes: functions, evolution and potential applications". *XXV International Congress of Entomology*, Symposium on "Arthropod Saliva: From Basic Science to Practical Applications", September 25-30 2016, Orlando, Florida, USA. **Invited speaker**
38) **"**An RNAseq analysis of small RNAs from *Anopheles coluzzii"*. EMBO Conference "*Molecular and population biology of mosquitoes and other disease vectors: vector and disease control*", 24-28 July 2017 Kolymbari, Crete (Greece).
39) "Salivary antigens as epidemiological tools to evaluate human exposure to *Aedes albopictus*". Accademia Nazionale di Entomologia, Seduta Pubblica *Approcci genomici e molecolari per il controllo di specie invasive di insetti di interesse agrario e sanitario*, 8 June 2018, Florence (Italy). **Invited speaker**
40) **"**Salivary miRNAs from anopheline mosquitoes: additional players in vector-host-parasite interactions?". XXX Congresso Nazionale della Società Italiana di Parassitologia (SoIPa). 26-29 June 2018, Milano, Italy.
41) "Salivary miRNAs from anopheline mosquitoes: additional players in vector-host-parasite interactions?". XI European Congress of Entomology, 2-6 July 2018, Naples, Italy. **Invited speaker**

ABSTRACTS IN NATIONAL OR INTERNATIONAL CONFERENCES

1) Fucci L., Lancieri M., **Arcà B.** e Geraci G. Effetto di ioni sulla sintesi "in vitro" di globine in cellule eritroidi di embrioni di pollo. Atti AGI-SIBBM. Padova, 5-9 October 1987: p.112.
2) Geraci G., **Arcà B.**, Cirotto C. and Fucci L. The hemoglobins in the ontogeny of the chicken embryo. VI Simposium USSR-Italy. Macromolecules in the functioning cell. Leningrad, 21-25 June 1988: p. 142.
3) **Arcà B.**, Fucci L., Maharajan V. e De Petrocellis L. Induzione di nuovi mRNA in *Hydra attenuata* dopo trattamento con 5-Azacitidina. Atti XXV Convegno Scientifico SIBBM. Martina Franca, 12-14 October 1988: p. 119.
4) **Arcà B.**, Fucci L., Marino G. and De Petrocellis L. 5-Azacitydine treated Hydra: analysis of protein synthesis during head regeneration. 19th FEBS Meeting. Roma, 2-7 July 1989.
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