Europass
Curriculum Vitae

Personal information

First name / Surname **Alessia Cappelli**

Nationality Italian

Date of birth September 8th 1980

Gender Female

Work experience

Dicember 2012-Today

Employed as Post-Doc within the research project IDEAS Programme ERC Starting Grant "Yeasts symbionts of malaria vectors: from basic research to the management of malaria control" at the Laboratory of Parasitology, University of Camerino (Tutor: Dott. Irene Ricci).

Main activities and responsibilities

My work was focus on characterization of killer toxins produced by the symbiotic yeasts *Wickerhamomyces anomalus* isolated from *Anopheles stephensi* mosquitoes, vector of malaria. The yeast *W. anomalus* has been detected at all the developmental stages of both malaria (*An. stephensi*, *An. gambiae*) and dengue mosquito vectors (*Ae. aegypti*, *Ae. albopictus*), where it localizes in the midgut and reproductive organs (Ricci et al. 2011). Yeasts of genus *Wickerhamomyces* has been reported to produce a killer toxin against different microorganisms (yeast as *Candida sp.*, *Microsporum spp*. and *Trichophyton spp*., etc.). In particular, I demonstrated the *in vitro* microbial activity of the killer toxin against sensible yeast strains/species. Moreover, experiments *in vivo* showed that cultivated yeasts can easily colonize mosquitoes and then continue with toxin production for at least four weeks. These features are particularly interesting for potential applications of *W. anomalus* in Symbiotic Control strategies for the control of vector-borne diseases. (Cappelli et al. 2014).

July 2009 – July 2012

Employed as Post-Doc within the research project FIRB-IDEAS "Assessment of the potential role of bacteria of the genus *Asaia* as microbial agent for paratransgenic control of malaria vectors" at the Laboratory of Parasitology, University of Camerino (Tutor: Prof. Guido Favia).

Main activities and responsibilities

Project was focused on the symbiosis relationship of bacteria of genus *Asaia* with malaria mosquito vectors. *Asaia* is a extracellular bacterium, found in the gut, the salivary glands, and reproductive organs in different mosquito species, like the malaria mosquito vectors *Anopheles stephensi* and *Anopheles gambiae* or the virus vector *Aedes aegypti*. In particular my work was about *Asaia* circulation in different mosquito species detected by qPCR (*An. gambiae*, *An. stephensi*, *Ae. aegypti*, *Ae. albopictus* and *Culex quinquefasciatus*). Furthermore the aim of my project has been to demostrated a possible competition between *Asaia* and *Wolbachia* bacteria in the *Aedes albopictus* mosquito. The cytoplasmic symbiont *Wolbachia* was detected in several genera including *Aedes*, *Culex*, *Coquillettidia*, and *Mansonia*. It is interesting to note that *Wolbachia* does not infect the natural population of the species *Ae. aegypti*, and, very recently, its presence was detected in only in a few individuals of a natural small population of *An. gambiae* where the presence of *Asaia* was not investigated (Baldini et al. 2014). Recently the data collected by me and my collegues work were published in the article: "Mutual exclusion of *Asaia* and *Wolbachia* in the reproductive organs of mosquito vectors" (Rossi et al. 2015).

Education and training

2006 - 2009 Ph.D in Environmental Sciences and Public Health XXI cycle - Development of Biotechnology for Environmental Sciences and Public Health, University of Camerino. Title of thesis: "*Development of a diagnostic procedure for genetic analysis of genes involved in Monogenic Diseases with autosomal dominant inheritance (MODY2, MODY3 and CADASIL)*" (Supervisor Prof. Cristina Miceli and Dott. Luigi Pianese).

Synopsis of Ph.D During my Ph.D., entitled "Development of Biotechnology for Environmental Sciences and Public Health" (XXI cycle), I worked at Molecular Medicine Laboratory of U.O. Clinical and Microbiology Laboratory (ASUR ZT13, Ascoli Piceno). My study was supported by a convention between the ASUR ZT13 (Ascoli Piceno) and the Doctoral Course in Environmental Sciences and Public Health (University of Camerino). The Molecular Medicine Laboratory was established in 2006 with the aim to become a regional reference centre for the molecular diagnosis of monogenic disease with autosomal dominant inheritance, as some forms of diabetes in young patients, Maturity Onset Diabetes of the Young type 2 and 3 (MODY 2 and 3), and a form of vascular dementia, the cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy (CADASIL). The aim of my job was to develop and validate a methodology, based on direct sequencing, for the molecular diagnosis of MODY2, MODY3 and CADASIL caused by mutations in glucokinase (GCK), Hepatocyte Nuclear Factor 1 A (HNF1A) and NOTCH3 genes respectively. Analysis of GCK and HNF1A genes identified three novel mutations: the missense mutation G170D and the deletion/insertion P432Xfs in GCK and the splicing mutation IVS4nt-1G>T, in HNF1A. For IVS4nt-1G>T the sequence analysis of RT-PCR products demonstrated exon skipping with the use of a cryptic splicing site (Cappelli et al. 2009). A new frameshift mutation in exon 4 of gene GCK, caused by a heterozygous guanine deletion at position 382 (c.382delG, p.E128Xfs), was identified in a 15-year-old male. No mutation was detected in the parents. Polymorphic markers' study excluded false paternity indicating that c.382delG is a novel de novo mutation (Cappelli et al. 2011). Furthermore, I reported the high recurrence of R1006C mutation in ten families all originate from a restricted area of central Italy, the town of Ascoli Piceno and same neighbour villages. A PCR-Restriction Fragment Length Polymorphism (RFLP) assay to analyze the R1006C mutation was also developed. For this mutation, these findings might suggest, the presence of a common ancestor (Cappelli et al. 2009).

November 2006 Authorization to practice the profession of Biologist

2003 - 2005 University of Camerino, Camerino (MC) Italy
Master Degree in "Molecular Biology"
Grade: 110 cum laude
Title of thesis: "Espressione e funzione del recettore TRPV1 in tumori uroteliali umani"

2000 - 2003 University of Camerino, Camerino (MC) Italy
Degree in "Biology" (3 years)
Grade: 110 cum laude
Title of thesis: "Analisi dell'espressione dei recettori neurochininici e vanilloidi nei timociti di ratto mediante real-time PCR"

July 2000 Liceo Sientifico A. Orsini, Ascoli Piceno, Italy
Maturità scientifica

Personal skills and competences

- Manual and automatic DNA and RNA extraction; PCR; RT-PCR; PCR-RLFP; NESTED-PCR; real-time PCR; synthesis of cDNA; acid nucleic electrophoresis in agarose gel; direct sequencing; purification of PCR and sequencing products; cloning with traditional and expression vectors (GFP).
- Cell culture in selective culture medium; counting cells using a microscope counting chamber; isolation and extraction of Rat Thymocytes using Ficoll protocoll; FACS; MMT and SRB assay.
- Bacteria e yeasts culture in universal and selective medium (liquid and agar medium).
- Protein electrophoresis in acrylamide gel; Western Blot; killer activity assay of toxic proteins; use of monoclonal and polyclonal antibodies.
- Preparation of slides and use of optical and fluorescence microscopy.
- Insectary competences: maintenance of several strain of mosquito (*Anopheles stephensi*, *An.gambiae*, *Aedes albopictus* and *Ae. aegipty*), colonization of mosquito using wild type and genetically modified bacteria and yeasts.
- Ability to maintain the life cycle of *Plasmodium berghei* in the murine model.

Excellent use of the Instruments: MagNA Pure LC System Package, Roche (Nucleic acid isolation and purification platform) and 4-capillary ABI 3130 Genetic Analyzer, Applied Biosystems (electrophoresis instrument for sequences), NanoDrop 1000, Thermo Scientific (Spectrophotometer), CFX96 qPCR (Bio-Rad).

Mother tongue(s) Italian

Other language(s) English

Self-assessment	Understanding		Speaking		Writing
European level (*)	Listening	Reading	Spoken interaction	Spoken production	
English	Good	Good	Good	Good	Good

Social skills and competences Ability to work with colleagues from different countries

Organisational skills and competences I have followed the laboratory activity of undergraduate, graduate and PhD students

Computer skills and competences

Operating Systems: Windows,

Word Processing: Office (Word, Excell, Power Point)

Databases and softwares for sequence analysis: Sequence analysis software, SeqScape software, Chromas, NCBI, Ensembl, HGMD data base, VectorBase)

Scientific Graphing: GraphPad Prism, MxPro, Bio-rad CFX Manager

Basic Knowledge of Bioinformatics (Blast, ClustalW, etc.)

Driving licence Category B

Brief track-record

Research interests

General and molecular parasitology, genetics, microbiology, cellular biology, molecular biology (and their applications), study of symbiosis in mosquito vectors.

Publications:

10 articles in international journals (2 as first and corresponding author and 2 as first author), 1 chapter and 18 proceedings (two of them published in European Journal of Human Genetics Supplement).
Currently 2 article submitted at Malaria Journal and Scientific Report.
Bibliometric indices: H-index of 6 with a number of total citations of 92 (Google Scholar); H-index of 6 with 66 citations (Scopus). My ORCID ID is: 0000-0003-4553-9360.

Teaching activity:

I have acted as co-supervisors of 10 undergraduate students of the bachelor in Biology, Biology of Nutrition and Biosciences and Biotechnology, 1 students of the Master degree in Biology and 6 PhD students in Development of Biotechnology for Environmental Sciences and Public Health.
I have been teaching assistant in the Laboratory practice course for the Bachelor Program in Biosciences and Biotechnology.

Review activity:

I have been serving as referee for the journals: Recent Patents on CNS Drug Discovery, Neurology International, International Journal of Insect Science, Gene and Diabetes Research and Clinical Practice.

Publications

Mancini MV, Spaccapelo R, Damiani C, Accoti A, Tallarita M, Petraglia E, Rossi P, **Cappelli A**, Capone A, Valzano M, Picciolini M, Diabaté A, Facchinelli L, Ricci I, Favia G. Paratransgenesis to control malaria vectors: a semi-field pilot control. Submitted to Scientific Report

Valzano M, Cecarini V, **Cappelli A**, Capone A, Bozic J, Cuccioloni M, Epis S, Petrelli D, Angeletti M, Eleuteri AM, Favia G, Ricci I. A yeast strain associated to Anopheles mosquitoes produces a toxin able to kill the malaria parasite. Submitted to Malaria Journal

Rossi P, Ricci I, **Cappelli A**, Damiani C, Ulissi U, Mancini MV, Valzano M, Capone A, Epis S, Crotti E, Chouaia B, Scuppa P, Joshi D, Xi Z, Mandrioli M, Sacchi L, O'Neill SL, Favia G. (2015) Mutual exclusion of Asaia and Wolbachia in the reproductive organs of mosquito vectors. Parasites & Vectors, 8:278

Cappelli A, Ulissi U, Valzano M, Damiani C, Epis S, Gabbrielli MG, Conti S, Polonelli L, Bandi C, Favia G, Ricci I. (2014) A Wickerhamomyces anomalus Killer Strain in the Malaria Vector Anopheles stephensi. PLoS One, 9:e95988.

DeFrecee C, Damiani C, Valzano M, D'Amelio S, **Cappelli A**, Ricci I, Favia G. (2014) Detection and isolation of the α-proteobacterium Asaia in Culex mosquitoes. Medical and Veterinary Entomology, 28:438-442

Ricci I, Valzano M, Ulissi U, Epis S, **Cappelli A**, Favia G. (2012) Symbiotic Control of Mosquito Borne Disease. Pathog Glob Health, 106:380-385.

Cappelli A, Silvestri S, Tumini S, Carinci S, Cipriano P, Massi L, Staffolani P, Pianese L. (2011). A new de novo mutation in the GCK gene causing MODY2. Diabetes Research and Clinical Practice, 93:41-43

Ricci I, Mosca M, Valzano M, Damiani C, Scuppa P, Rossi P, Crotti E, **Cappelli A**, Ulissi U, Capone A, Esposito F, Alma A, Mandrioli M, Sacchi L, Bandi C, Daffonchio D, Favia G. (2011). Different mosquito species host Wickerhamomyces anomalus (Pichia anomala): perspectives on vector-borne diseases symbiotic control. Antonie Van Leeuwenhoek, 99: 43-50.

Ricci I, Damiani C, Rossi P, Capone A, Scuppa P, **Cappelli A**, Ulissi U, Mosca M, Valzano M, Epis S, Crotti E, Daffonchio D, Alma A, Sacchi L, Mandrioli M, Bandi C, Favia G. (2011). *Mosquito symbioses: from basic research to the paratransgenic control of mosquito-borne diseases*. Journal of applied entomology, 135:487-493

Bianchi S, Rufa A, Ragno M, D'eramo C, Pescini F, Pantoni L, **Cappelli A**, Perretti A, Zicari E, Zolo P, Inzitari D, Dotti MT, Federico A. (2010). *High frequency of exon 10 mutations in the NOTCH3 gene in Italian CADASIL families: phenotypic peculiarities*. Journal of Neurology, 257:1039-1042.

Cappelli A, Ragno M, Cacchiò G, Scarcella M, Staffolani P, Pianese L (2009). *High recurrence of the R1006C NOTCH3 mutation in central Italian patients with cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy (CADASIL)*. Neuroscience Letters, 462:176-178

Cappelli A, Tumini S, Consoli A, Carinci S, Piersanti C, Ruggiero G, Simonella G, Soletti F, Staffolani P, Pianese L (2009). *Novel mutations in GCK and HNF1A genes in Italian families with MODY phenotype*. Diabetes Research and Clinical Practice, 83:72-74

Chapter book

Ricci I, Scuppa P, Damiani C, Rossi P, Capone A, De Freece C, Valzano M, **Cappelli A**, Mosca M, Ulissi U, Favia G. (2012). *Facing malaria parasite with mosquito symbionts*. In Malaria Parasites. Ed. Intech Open access publisher ISBN 979-953-307-072-7 by Omolade Okwa Lagos State University, Nigeria.

Abstract of journal

Ricci I, Damiani C, Rossi P, Capone A, Valzano M, **Cappelli A**, Bozic J, Mancini MV, Favia G. Symbionts and mosquito vectors: work in progress at UNICAM. XXVIII Congresso SOIPA (p. 61). Roma, Italia, 24-27 giugno 2014.

Mancini MV, Bozic J, Capone A, **Cappelli A**, Damiani C, Epis S, Rossi P, Valzano M, Bandi C, Ricci I, Favia G. Bacterial symbiotic control of mosquito vectors: from bench to field. XXVIII Congresso SOIPA (p. 183). Roma, Italia, 24-27 giugno 2014.

Bozic J, Capone A, Valzano M, **Cappelli A**, Damiani C, Rossi P, Mancini MV, Favia G, Ricci I. Using symbiotic yeasts associated to mosquitoes to prevent plasmodial infection in malaria vectors: current status and future strategies for symbiotic control of mosquito borne disease. XXVIII Congresso SOIPA (p. 184). Roma, Italia, 24-27 giugno 2014.

Capone A, Bozic J, **Cappelli A**, Damiani C, Rossi P, Valzano M, Epis S, Favia G, Ricci I. Engineering of the yeast Wickerhamomyces anomalus, symbiont of mosquito species relevant to public health, for paratransgenic control strategies. XXVIII Congresso SOIPA (p. 185). Roma, Italia, 24-27 giugno 2014.

Valzano M, **Cappelli A**, Ulissi U, Damiani C, Capone A, Bozic J, Cecarini V, Favia G, Ricci I. A killer yeast strain is harbored in malaria vectors: new insights in the mosquito biology and possible implications in the malaria transmission blocking. XXVIII Congresso SOIPA (p. 213). Roma, Italia, 24-27 giugno 2014.

Capone A, Ricci I, Damiani C, Rossi P, Scuppa P, Valzano M, **Cappelli A**, DeFreece C, Ulissi U, Favia G. Mosquito/microbiota interactions: from basic research to biotechnological perspectives in mosquito borne disease control. XXVII Congresso Nazionale della Società Italiana di Parassitologia. 26-29 June 2012 Alghero, Italy.

Damiani C, Ricci I, **Cappelli A**, Ulissi U, Rossi P, Capone A, Scuppa P, Mosca M, Valzano M, Crotti E, Epis S, Esposito F, Sacchi L, Mandrioli M, Bandi C, Daffonchio D, Favia G. *Acetic acid bacteria in malaria vectors: a possible strategy for malaria control?* XXVI Congresso Nazionale della Società Italiana di Parassitologia. 22-25 June 2010 Perugia, Italy.

Rossi P, Damiani C, Ricci I, **Cappelli A**, Ulissi U, Capone A, Scuppa P, Mosca M, Valzano M, Esposito F, Sacchi L, Bandi C, Daffonchio D, Favia G. *Bacterial symbionts in Aedes aegypti and Aedes albopictus*. XXVI Congresso Nazionale della Società Italiana di Parassitologia. 22-25 June 2010 Perugia, Italy.

Cappelli A, Silvestri S, Staffolani P, Consoli A, Pianese L (2008). *A novel splicing mutation in the HNF1a gene in an Italian family with MODY3 disease*. European Journal of Human Genetics, Vol 16 Supplement, p 268

Pianese L, **Cappelli A**, Scarcella M, Cacchiò G, Staffolani P, Ragno M (2008). *Screening for CADASIL in central Italian patients*. European Journal of Human Genetics, Vol 16 Supplement,p 242.

Abstract in Congress

Ragno M, **Cappelli A**, Cacchiò G, Scarcella M, Di Marzio F, Staffolani P, Pianese L. *Analisi mutazionale del gene Notch3 in 60 famiglie provenienti da una ristretta area geografica: alta ricorrenza della mutazione R1006C in 10 famiglie CADASIL.* XLIX Congresso nazionale SNO. 13-16 May 2009 Palermo, Italy.

Ragno M, Pianese L, Scarcella M, Cacchiò G, **Cappelli A**, Caporale CM. *The clinical phenotype in 9 CADASIL families with mutation CGC-TGC at codon 1006 in the exon 19 Notch3 gene.* XXXVIII Congresso Società Italiana di Neurologia. 13-17 Ottobre 2007 Firenze, Italy.

Posters in Congress

Cappelli A, Ragno M, Cacchiò G, Scarcella M, Silvestri S, Staffolani P, Pianese L. *High recurrence of the R1006C Notch3 mutation in central italian patients with Cerebral Autosomal Dominant Arteriopathy with Subcortical Infarcts and Leukoencephalopathy (CADASIL)*. 59° Congresso Nazionale AIPaCMeM. 12-15 May 2009 Tivoli (RM), Italy. **Award to scientific work by President of Regione Marche della AIPaCMeM**

Pianese L, **Cappelli A**, Scarcella M, Cacchiò G, Staffolani P, Ragno M. *Screening for CADASIL in central Italian patients*. 58° Congresso Nazionale AIPaCMeM. 10-13 Giugno 2008 Caserta, Italy

Cappelli A, Silvestri S, Staffolani P, Consoli A, Pianese L. *A novel splicing mutation in the HNF1A gene in an italian family with MODY3 disease*. 58° Congresso Nazionale AIPaCMeM. 10-13 Giugno 2008 Caserta, Italy. **Poster awarded with honours.**

Cappelli A, Ragno M, Scarcella M, Cacchiò G, Caporale CM, Staffolani P, Pianese L. *Screening mutazionale del gene Notch3: due mutazioni frequenti nel territorio di Ascoli Piceno*. 57° Congresso Nazionale AIPaCMeM. 27-30 Novembre 2007 Caserta, Italy

Pianese L, **Cappelli A**, Soletti F, Simonella G, Staffolani P. *Analisi mutazionale dei geni GCK e HNF1a in pazienti con quadro clinico riconducibile a diabete mellito tipo Mody*. 57° Congresso Nazionale AIPaCMeM. 27-30 Novembre 2007 Caserta, Italy

Cappelli A, Ragno M, Scarcella M, Cacchiò G, Caporale CM, Staffolani P, Pianese L. *Screening mutazionale del gene Notch3: due mutazioni frequenti nel territorio di Ascoli Piceno*. X Congresso Nazionale SIGU 14-16 novembre 2007 Montecatini Terme (PT), Italy.

Other Poster

Ricci I, Ulissi U, Mosca M, Damiani C, Scuppa P, **Cappelli A**, Favia G. Antimicrobial toxins are produced by symbiotic yeasts in the midgut of some malaria vectors. (Istituto Superiore di Sanità, Rome, Italy, 11 Jan. 2011).

Courses and Workshops

INFRAVEC Workshop. *Bioinformatic Workshop for Vector Biologists*. 16-17 July 2012 Hinxton, Cambridge, United Kingdom

Reducing Plasmodium transmission and malaria burden by integrated vector control A multi-disciplinary and multi-cultural training workshop. 6-11 July 2009 Camerino, Italy,

English Course at Wall Street Institute. Jan-Sep 2007:

Stage at "Laboratorio di Neuropatologia del Policlinico Gian Battista Rossi (Borgo Roma)" 02-06 Oct 2006 Verona, Italy

Camerino, lì 05.11.2015

Alessia Cappelli