

# GIULIA BERNARDINI

## Curriculum Vitae

### PLACE OF WORK:

University of Siena

Dept. of Biotechnology, chemistry and pharmacy, “Dipartimento di Eccellenza 2018-2022”, via A. Moro 2, 53100, Siena, Italy,

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### WORKING EXPERIENCE:

2019-today: Associate Professor of Biochemistry, Dept. of Biotechnology, chemistry and pharmacy;

2018-today: Delegate for the Placement of the Dept. of Biotechnology, chemistry and pharmacy;

2018-today: Member of the Technological Facilities Committee at Dept. of Biotechnology, chemistry and pharmacy;

2017-2018: Delegate for the Third Mission and member of the Research Committee at Dept. of Biotechnology, chemistry and pharmacy;

2016-2019: Fixed-term research assistant (RTD-B) in Biochemistry (SC 05/E- Biochimica e biologia molecolare sperimentali e cliniche, SSD BIO/10 Biochimica) at the Department of Biotechnology, chemistry and pharmacy of University of Siena.

2015-2016: Post-doc at the Department of Biotechnology, chemistry and pharmacy of University of Siena, in the group directed by Prof. Annalisa Santucci. Research project: Physiopathological mechanisms of rare metabolic diseases

2013-2014: Teaching and research contract at the Department of Biotechnology, chemistry and pharmacy of University of Siena, SSD: BIO/10.

2012-2013: Post-doc at the Department of Biotechnology, chemistry and pharmacy of University of Siena, in the group directed by Prof. Annalisa Santucci. Research project: Identification of urinary biomarkers by means of post-genomic approaches for the development of novel diagnostic devices

2011-2012: Post-doc at Department of Biotechnology of University of Siena, in the group directed by Prof. Annalisa Santucci. Research project: Phosphoproteomics to study human osteosarcoma.

2009-2011: Fellowship Piano di marketing territoriale della provincia di Siena “Borsa di ricerca per l’attrazione di ricercatori in azienda”. SELDI-ToF/MS applied to the discovery of urinary biomarkers of infection for the development of new diagnostic devices.

2006 May-July: Stage at the University of New South Wales, Sydney, in Marc Wilkins’ laboratory. She worked on MS-based approaches for determination of proteins PTMs.

2005-2009 Post-doc at the Department of Molecular Biology of University of Siena, in the group directed by Prof. Annalisa Santucci. Research project: Study of Post-Translational modifications by Post-Genomic techniques.

### EDUCATION BACKGROUND:

2004 University of Siena, PhD degree in Pharmaceutical Science.

Title of the thesis “Proteomic analysis of *Neisseria meningitidis* serogroup A. Supervisor: Prof. Paola Martelli, Co-supervisor: Prof. Annalisa Santucci

2001-2004 PhD student at the Department of Molecular Biology of the University of Siena, in the laboratory directed by Prof. Paola Martelli under the supervision of Prof. Annalisa Santucci. The project was conducted in collaboration with Prof. Mark Achtman (Max Planck Institute, Berlin, Germany) and Dr. Guido Grandi (Molecular Biology Department Director of Chiron Research Centre, Siena, Italy).

2001 University of Siena, degree in Pharmaceutical Chemistry and Technology, Faculty of Pharmacy. Title of the thesis "Production and characterization of polyclonal antibodies against RGL2 protein". Supervisor: Prof. Lorenza Trabalzini.

2000-2001 Training in the Department of Molecular Biology of the University of Siena, in the laboratory directed by Prof. Paola Martelli under the supervision of Prof. Lorenza Trabalzini. She collaborated within a research project concerning the study of the role of low molecular weight G proteins in regulation of platelet function.

## RESEARCH ACTIVITY AND INTERESTS:

### Pathogen microorganisms

- Proteomics and Immunoproteomics of Meningococcus serogroup A and B for the development of innovative vaccines and for epidemiological studies;
- Proteomic and immunoproteomic analysis of *Helicobacter pylori* related to different gastric and extragastric pathologies;
- Proteomics of *Legionella pneumophila* for urinary biomarker discovery.

### *Saccharomyces cerevisiae*

- Phenotypic and functional analysis of enological yeasts;
- Study of response to oxidative stress in eucariotic cell.

### Rare Diseases

- Osteosarcoma: proteomics of OS primary cells and cells lines to investigate the cancer related processes; evaluation and characterization of antiproliferative and pro-apoptotic molecules;
- Alkaptonuria: studies on the disease mechanisms and on the ochronotic process by means of *in vitro* and *ex vivo* cells and tissue models; development of novel therapeutic approaches.
- Lesch-Nhyan: studies on the disease mechanisms; development of novel therapeutic approaches.
- Systemic scleroderma: studies on the disease mechanisms.

### Nutraceuticals

- Extraction, chemical and biochemical characterization, and evaluation of biological activity of algal compounds (*Padina pavonica*, *Chetomorpha linum*, etc);
- Extraction, chemical and biochemical characterization, and evaluation of biological activity of compounds from chestnut shells and leaves;
- Evaluation of biological activity of home-made beer.

### Others

- Study of post-translational modifications by post-genomic and mass spectrometry techniques.
- Proteomic analysis to evaluate biocompatibility of biomaterials

## PROFESSIONAL SKILLS:

Bacteria and yeast culture techniques; Two-hybrid screening; DNA cloning; PCR and qRT-PCR; Expression and purification of recombinant proteins; Electrophoresis of proteins on polyacrylamide gel (SDS-PAGE, IEF, 2D-PAGE); Immunoblotting; Mass Spectrometry (MALDI-ToF, SELDI-ToF, ESI-Triple quadrupole); Bioinformatics (sequences analysis, access to/searching in databases, use of proteomic “tools” and software (Melanie II 2D-PAGE, PDQuest, ImageMaster 2D Platinum).

## LANGUAGES:

Italian: native language

English: First Certificate in English (University of Cambridge ESOL Examinations), B2 level of the ‘Common European Framework of Reference for Languages’ (CEFR).

## TEACHING ACTIVITY:

Molecular biology; biochemistry; advanced biochemical methodologies; cellular biochemistry; applied biochemistry; enzymology.  
Supporting Teaching Activity for undergraduate and PhD students’ thesis preparation.

## REVIEWER ACTIVITY

### Journals

*Expert Opinion on Medical Diagnostics (EODG), Proteomics, PROTEOMICS - Clinical Applications, Molecular and Cellular Proteomics, Molecular Medicine, Journal of Pediatric Infectious Diseases, Helicobacter, Journal of Zhejiang University-SCIENCE B, Journal of Proteomics, International Journal of Molecular Sciences, Journal of Nanobiotechnology. Pesticide Biochemistry and Physiology, Archives of Dermatological Research, MEEGID-Infection, Genetics and Evolution, Helicobacter, Expert Review of Proteomics, Data in Brief, Journal of Agricultural and Food Chemistry, Water, Journal of Agricultural and Food Chemistry, Nanotechnology, Cellular Physiology and Biochemistry.*

### Research proposal

-ERA-NET PathoGenoMics”, 2nd joint call (transnational call 2008): “Applied pathogenomics: Prevention, diagnosis, treatment and monitoring of infectious diseases in humans”.  
-H2020-FETOPEN-1-2016-2017-RIA.  
-H2020 FETOPEN-01-2018-RIA.

## ORGANIZATION OF MEETINGS, WORKSHOPS AND SCHOOLS

2015 Focus sulla prima malattia genetica: l'Alcaptonuria, Siena 1 ottobre 2015.

2016 La malattia di Lesch-Nyhan: nuove prospettive nell'approccio diagnostico, terapeutico e assistenziale, Siena 15 ottobre 2016

2019 11th International Workshop on Alkaptonuria, Siena 29 gennaio 2019

## RESEARCH ACTIVITY

Author of over 90 articles published in scientific journals with Impact Factor (IF) and 4 book chapters.

h-index: 30 (Scopus, January 2024), 34 (Google Scholar, January 2024)

Total citations: 2534 (Scopus, January 2024), 3520 (Google Scholar, January 2024)

Author of 2 patents.

## PARTICIPATION IN RESEARCH PROJECTS FUNDED THROUGH COMPETITIVE CALLS

*As a member of the research group:*

2006 - Identification of new molecules with antiproliferative features for novel therapeutic strategies for the treatment of human osteosarcoma. FMPS-Fondazione Monte dei Paschi di Siena.

2006 - Clinical translation of preclinical knowledge in the field of muscle–skeletal tissue engineering for biological reconstruction of human material loss following traumatical and pathological events. FMPS-Fondazione Monte dei Paschi di Siena.

2008 - Studio proteomico e clinico della fisiopatologia dell'alcaptonuria ed allestimento di una terapia per il trattamento dell'ocronosi. Toscana Life Sciences Foundation, bando Orphan\_1. Progetto coordinato dalla Professoressa Annalisa Santucci.

2008 - Identification, characterization and evaluation of novel molecules with antiproliferative activity on human osteosarcoma. ISTITUTO TOSCANO TUMORI (ITT), bando 2008. Progetto coordinato dalla Professoressa Annalisa Santucci.

2008/2009 - Studio proteomico e clinico della fisiopatologia dell'alcaptonuria e creazione di un'associazione di pazienti. FMPS-Fondazione Monte dei Paschi di Siena. Progetto coordinato dalla Professoressa Annalisa Santucci

2010 - Identificazione e analisi preclinica di molecole terapeutiche per il trattamento dell'alcaptonuria FMPS-Fondazione Monte dei Paschi di Siena. Progetto coordinato dalla Professoressa Annalisa Santucci

2010 - Preclinical study of therapeutic agents for the treatment of ochronotic arthropathy. TELETHON\_grant GGP10058. Progetto coordinato dalla Professoressa Annalisa Santucci.

2011 - URIMARK: Realizzazione di sistemi ad elevata automazione per il monitoraggio di malattie infettive mediante il dosaggio di marcatori urinari. Regione Toscana, POR CREO FESR 2007-2013\_ ATTIVITA' 1.1 - LINEA DI INTERVENTO 1.1.C.

2012 - DEVELOPAKURE: Clinical Development of Nitisinone for Alkaptonuria. FP7-HEALTH-2012-INNOVATION-1.

2014 - BEERBONE: Studio degli effetti del silicio della birra della Val d'Orcia per il trattamento dell'osteoporosi e dell'osteoartrosi, Regione Toscana PROGETTI DI RICERCA NEL SETTORE NUTRACEUTICA-Annualità 2014. Progetto coordinato dalla Professoressa Annalisa Santucci.

2016 – OPENRICCIO: Ottenimenti di Prodotti Evoluti e Nuovi cosmetici e Ricognizioni Interattive per Catasto Castanicolo Ordinario. PROGETTO SOTTOMISURA 16.2- PSR 2014-2020 della Regione Toscana-Annualità 2015

*As Principal Investigator*

2010-2011: Progetto URIMARC II-Applicazione della tecnologia SELDI-ToF per l'individuazione di marcatori urinari per lo sviluppo di nuovi sistemi diagnostici. Borsa di ricerca per l'attrazione di ricercatori in azienda”, bando 2008. Piano di marketing territoriale della Provincia di Siena.

2009-2010: Progetto URIMARC-Applicazione della tecnologia SELDI-ToF per l'individuazione di marcatori urinari per lo sviluppo di nuovi sistemi diagnostici. Borsa di ricerca per l'attrazione di ricercatori in azienda”, bando 2008. Piano di marketing territoriale della Provincia di Siena.

#### COLLABORATIONS WITH RESEARCH GROUPS

-Professor Paola Migliorini, UO di Immunoallergologia clinica, Università degli Studi di Pisa. Biochemical studies of neutrophil extracellular traps (NET).

-Professor Nicola Giordano, Dipartimento di Scienze mediche, chirurgiche e neuroscienze, Università di Siena. Biochemical studies of systemic scleroderma.

-Professor Natale Figura, Università di Siena. Biochemical studies of *Helicobacter pylori*.

-Professor Bruno Annibale, Dipartimento di Scienze medico-chirurgiche e di medicina traslazionale, Università degli Studi di Roma “La Sapienza”. Biochemical studies of *Helicobacter pylori*.

-Dottors Lisa Vaccari e Alessandra Gianoncelli, Elettra - Sincrotrone Trieste. Molecular characterization of the ochronotic pigment.

#### COLLABORATIONS WITH COMPANIES

- Novartis Vaccines and Diagnostic srl (Siena, Italia). Proteomic and immunoproteomic characterization of recombinant bacterial antigens.

- Diesse Diagnostica Senese Spa (Siena, Italia). Development of diagnostic tools for *Legionella pneumophila* based on urinary antigens.

- ARETA International, (Gerenzano (VA), Italia). Proteomic and immunoproteomic characterization of polyclonal and monoclonal antibodies.

- ICP-Textinfine, (Mosta, Malta). Evaluation of the biological activity of algal natural extracts on bone cells.

- Entomon s.a.s (Firenze, Italia). Proteomic characterization of insect derivatives.