Sara D'Imperio

Date of birth: 31 January 1990

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EXPERIENCE and RESEARCH

Coordinator of genetic cardiomyopathy counseling 2022 - Present

Department Arrhythmology and Electrophysiologist, IRCCS Policlinico San Donato

I address patients' various medical requests to members of our team. Furthermore, I deal with nutritional education, administrative aspects and post-discharge patient management. The main aim is to offer a point of reference in addition to the doctor so that the patient can undertake a healthy and balanced lifestyle while respecting his clinical conditions.

Biologist and Nutritionist 2021 – Present

Novara, Arona, Borgomanero and online

I assess the individual needs of the patient based on their medical history and personal preferences to develop tailored meal plans. To develop a personalized meal plan, an honest and detailed conversation with the patient is required to assess not only the medical history, but also to ensure that the patient will adhere to a certain diet. It is very difficult to change one's lifestyle and habits. In addition to the genetic background and medical diagnosis, the work-life balance of each patient (time to cook?), his/her desire to lose weight, and the patients' attitude are fundamental indications for the development of an adequate meal plan. Once I gathered all the necessary information, I write a detailed meal plan and then follow the patient, modify the plan if necessary, and encourage the patient to follow it.

Biologist, Nutritionist and Clinical Scientist 2021 – Present

Department Arrhythmology and Electrophysiologist, IRCCS Policlinico San Donato

I study the impact that nutrition and eating habits can have in the development of cardiac arrhythmias, as well as in overall cardiovascular health and well-being. Furthermore, I also specifically study the role of genetics in relation to various eating habits. The goal is to better understand how patients can improve their eating habits to minimize the risk of cardiovascular disease and how to adapt diets to the specific needs of each patient. To better do my job, I use the most up-to-date studies and research.

PhD Student, *Dept. of Biotechnology and Translational Medicine, Laboratory of Stem Cells for Tissue Engineering, University of Milan; IRCCS Policlinico San Donato; and University Vita-Salute San Raffaele* 2017- 2020

The major aim of my PhD project was to develop new functional assays for the study of the activity of sodium, calcium, and potassium ion channels in a high-throughput manner. I have studied the physiology, molecular biology, pharmacology, and genetics of cardiac arrhythmia, focusing particularly on Brugada Syndrome and Long QT Syndrome. I have used patient / family data for scientific research to better understand the mechanisms of cardiac arrhythmias and why the molecular mechanisms reveal different differences among families. I have used genetic information from patients to study the effects of specific mutations in the lab.

My PhD Project is part of the Research Funding "Development of a diagnostic test for the Brugada syndrome". Prof. Luigi Anastasia co P.I. with Prof. C. Pappone. Private Investors. Total Budget: Euro 2.042.780,33.

Teaching Assistant in Biochemistry, *Dept. Biomedical Sciences for Health University of Milan* 2017-2019

I delivered lectures and facilitated effective learning for 60+ undergraduate students.
I developed multiple training exams to test the students' ability to apply the instructed material. I clarified difficult topics to individual students.

Research and Development Associate Scientist, *Lattice Biologics, Ltd.* 2016- 2017
Scottsdale, AZ, USA

I worked as an Associate Scientist for Lattice Biologics, a start-up based in Scottsdale Arizona. The focus of my job was developing a 3D environment with human extracellular matrix with the purpose to mimic the tissue microenvironment for expanding human-derived stem cells. I was also co-author on a Provisional Patent we filled in February 2017 titled "Methods of Processing Biological Liquid Allografts and Methods of Use". This product called AmnioBoost™ is a minimally processed amniotic fluid supplement for the treatment of joint pain associated with osteoarthritis. I contributed to develop manufacturing processes and compose SOPs for processing technicians. On a weekly basis, I performed biochemistry and molecular biology assays, such as Western Blot, Protein quantifications, SDS- electrophoresis, DNA extraction and quantification, and PCR.
The entire product development experience was a valuable lesson in translating our research to the manufacturing process and bringing a product to market. I was able to work with the entire staff to solve problems, manage projects, communicate with physicians in the field, and achieve compliance with quality control and regulatory standards.

Graduate Student Researcher, *Dept. of Molecular Biology & Biochemistry Laboratory of Christopher C.W. Hughes* 2014-2016
UC Irvine, Irvine, CA

My thesis was focused on the "Evaluation of vascular network formation in pancreatic extracellular matrix". I utilized a vascularized, micro-organ-a-chip to evaluate the vascular network formation and function in pancreatic-specific ECM within a 3D environment, emulating the native pancreas. The cross-disciplinary nature of my studies allowed me to achieve competence with a variety of analytical laboratory techniques and cellular biology techniques, such as propagating human primary cells, e.g. endothelial progenitor cells, and human fibroblasts. I also acquired expertise on the fabrication of microfluidic devices made from polydimethyl siloxane (PDMS).

Undergraduate Student Researcher, *Biomedical Embryology Laboratory* 2012-2013
University of Milan, Milan, Italy

During my Bachelor Degree studies, the objective of my research project was to evaluate the "Damage and Repair of DNA and the comparison of the different methods of cryopreservation of whole ovaries." We compared conventional slow equilibrium cooling and directional freezing. I independently managed the preparation of 10 whole ovary samples on a weekly basis, including the injection of the cleansing saline solution and DMSO (dimethyl sulfoxide). I acquired and perfected skills to utilize the Microtome in preparing sample slices, 5-9 micron thick, and I also trained second-year undergraduates in sample staining (hematoxylin and eosin).

EDUCATION

Master in Functional Medicine and Nutrition 2023 - present
Scuola di Medicina e Nutrizione Funzionale

Post Doc, specializing in the physiology of nutrition in cardiac arrhythmias 2023
IRCCS Policlinico San Donato
Advisors: Prof. Carlo Pappone and Dr. Michelle Monasky

Master in Human Nutrition 2021
Istituto per l'alta formazione - Nutrifor

Doctor of Philosophy in Biochemical Sciences 2020
University of Milan (Università degli Studi di Milano)

- Ph.D. Thesis: "Development of functional assays for the study of sodium, calcium, and potassium ion channels activity in Brugada Syndrome"

Master of Science Biotechnology 2016
University of California Irvine, Irvine, CA

- Master's Thesis: "*Evaluation of vascular network formation in pancreatic extracellular matrix*"

Bachelor of Science in Veterinary Biotechnology 2013
University of Milan (Università degli Studi di Milano), School of Veterinary Medicine

- Undergraduate Thesis: *"Damage and Repair of DNA and the comparison of the different methods of cryopreservation of whole ovaries"*

PUBLICATIONS

Ghiroldi A, Ciconte G, Creo P, Tarantino A, Melgari D, D'Imperio S, Piccoli M, Cirillo F, Micaglio E, Monasky MM, Frosio A, Locati ET, Vicedomini G, Rivolta I, Pappone C, Anastasia L. Alterations of the Sialylation Machinery in Brugada Syndrome. Int J Mol Sci. 2022 Oct 29;23(21):13154. doi: 10.3390/ijms232113154. PMID: 36361941; PMCID: PMC9655504.

Monasky MM, Micaglio E, **D'Imperio S**, Pappone C. The Mechanism of Ajmaline and Thus Brugada Syndrome: Not Only the Sodium Channel! Front Cardiovasc Med. 2021 Dec 23;8:782596. doi: 10.3389/fcvm.2021.782596. PMID: 35004896; PMCID: PMC8733296.

D'Imperio S, Monasky MM, Micaglio E, Ciconte G, Anastasia L, Pappone C. Brugada Syndrome: Warning of a Systemic Condition? Front Cardiovasc Med. 2021 Oct 15;8:771349. doi: 10.3389/fcvm.2021.771349. PMID: 34722688; PMCID: PMC8553994.

D'Imperio S, Monasky MM, Micaglio E, Negro G, Pappone C. Impact of Dietary Factors on Brugada Syndrome and Long QT Syndrome. Nutrients. 2021 Jul 21;13(8):2482. doi: 10.3390/nu13082482. PMID: 34444641; PMCID: PMC8401538.

D'Imperio S, Monasky MM, Micaglio E, Negro G, Pappone C. Early Morning QT Prolongation During Hypoglycemia: Only a Matter of Glucose? Front Cardiovasc Med. 2021 May 11;8:688875. doi: 10.3389/fcvm.2021.688875. PMID: 34046442; PMCID: PMC8144311.

Monasky MM, Micaglio E, Ciconte G, Rivolta I, Borrelli V, Ghiroldi A, **D'Imperio S**, Binda A, Melgari D, Benedetti S, Mitrovic P, Anastasia L, Mecarocci V, Ćalović Ž, Casari G, Pappone C. Novel *SCN5A* p.Val1667Asp Missense Variant Segregation and Characterization in a Family with Severe Brugada Syndrome and Multiple Sudden Deaths. Int J Mol Sci. 2021 Apr 29;22(9):4700. doi: 10.3390/ijms22094700. PMID: 33946750; PMCID: PMC8125150.

Cirillo F, Piccoli M, Ghiroldi A, Monasky MM, Rota P, La Rocca P, Tarantino A, **D'Imperio S**, Signorelli P, Pappone C, Anastasia L. The antithetic role of ceramide and sphingosine-1-phosphate in cardiac dysfunction. J Cell Physiol. 2021 Jul;236(7):4857-4873. doi: 10.1002/jcp.30235. Epub 2021 Jan 11. PMID: 33432663.

Ciconte G, Monasky MM, Santinelli V, Micaglio E, Vicedomini G, Anastasia L, Negro G, Borrelli V, Giannelli L, Santini F, de Innocentiis C, Rondine R, Locati ET, Bernardini A, Mazza BC, Mecarocci V, Ćalović Ž, Ghiroldi A, **D'Imperio S**, Benedetti S, Di Resta C, Rivolta I, Casari G, Petretto E, Pappone C. Brugada syndrome genetics is associated with phenotype severity. Eur Heart J. 2021 Mar 14;42(11):1082-1090. doi: 10.1093/eurheartj/ehaa942. PMID: 33221895; PMCID: PMC7955973.

Ghiroldi A, Piccoli M, Creo P, Cirillo F, Rota P, **D'Imperio S**, Ciconte G, Monasky MM, Micaglio E, Garatti A, Aureli M, Carsana EV, Menicanti L, Pappone C, Anastasia L. Role of sialidase Neu3 and ganglioside GM3 in cardiac fibroblasts activation. Biochem J. 2020 Sep 18;477(17):3401-3415. doi: 10.1042/BCJ20200360. PMID: 32869836.

Monasky MM, Micaglio E, Vicedomini G, Locati ET, Ciconte G, Giannelli L, Giordano F, Crisà S, Vecchi M, Borrelli V, Ghiroldi A, **D'Imperio S,** Di Resta C, Benedetti S, Ferrari M, Santinelli V, Anastasia L, Pappone C. Comparable clinical characteristics in Brugada syndrome patients harboring SCN5A or novel SCN10A variants. Europace. 2019 Oct 1;21(10):1550-1558. doi: 10.1093/europace/euz186. PMID: 31292628.

Micaglio E, Monasky MM, Ciconte G, Vicedomini G, Conti M, Mecarocci V, Giannelli L, Giordano F, Pollina A, Saviano M, Crisà S, Borrelli V, Ghiroldi A, **D'Imperio S**, Di Resta C, Benedetti S, Ferrari M, Santinelli V, Anastasia L, Pappone C. SCN5A Nonsense Mutation and NF1 Frameshift Mutation in a Family With Brugada Syndrome and Neurofibromatosis. Front Genet. 2019 Feb 15;10:50. doi: 10.3389/fgene.2019.00050. PMID: 30828344; PMCID: PMC6384234.

PUBLISHED ABSTRACTS

Micaglio E, Ciconte G, Monasky MM, Vicedomini G, Mecarocci V, Giannelli L, Giordano F, Pollina AV, Saviano M, Crisà S, Borrelli V, Ghiroldi A, **D'Imperio S**, Di Resta C, Benedetti S, Ferrari M, Santinelli V, Anastasia L, Pappone C. Familial association of both molecularly confirmed type 1 Neurofibromatosis and Brugada syndrome. European Journal of Human Genetics volume 27, pages 1814–1920 (2019).

The 52nd European Society of Human Genetics (ESHG) Conference. Gothenburg, Sweden, 2019.

Liudmila Zakharova, **Sara D'Imperio**, Guy S. Cook, and Christopher A. Bradley. A novel platform for engineering the tumor 3D microenvironment. Tissue Engineering. 2017 Dec 3-6. Volume 23 Supplement 1 Page S66-S67 Poster. Society for NeuroOncology, Scottsdale, Arizona.

Liudmila Zakharova, **Sara D'Imperio**, Christopher A. Bradley, Guy S. Cook. Characterization Of Tissue- And Age-Specific ECM-based Gels For 3D Cell Microenvironment. Tissue Engineering. Meeting: TERMIS – Americas Conference and Exhibition, Charlotte, NC:

PATENTS

US Patent WO/2018/156746, *"Methods of Processing Biological Liquid Allografts and Methods of Use".* International Application No. PCT/US2018/019195. Inventors: Christopher A. Bradley, **Sara D'Imperio**, Liudmila Zakharova, Guy S. Cook. Applicants: Lattice Biologics LTD. International Classification: A61K 35/32, A61K 35/50, A61L 15/40, A61L 2400/06, A61L 2430/06, A61L 2430/34

POSTERS

Sara D'Imperio, Andrea Ghiroldi, Pasquale Creo, Giuseppe Ciconte, Emanuele Micaglio, Michelle M. Monasky, Gabriele Vicedomini, Ilaria Rivolta, Giovanni Tonon, Carlo Pappone, Luigi Anastasia. Nav1.5 functional assay to assess the effects of SCN5A mutations in Brugada Syndrome patients. 2019. Poster. OSR Retreat, Baveno (VCO).

Andrea Ghiroldi, Marco Piccoli, Andrea Garatti, Andrea Biondi, **Sara D'Imperio**, Maria Elena Canali, Lorenzo Menicanti, Luigi Anastasia. Effects of Neu3 sialidase activation on cardiac fibrosis. 2018. Poster. OSR Retreat, Baveno (VCO).

Marco Piccoli, Maria Elena Canali, Andrea Ghiroldi, Fabiola Tecla Bonezzi, Federica Cirillo, **Sara D'Imperio**, Luigi Anastasia. The Role of sialidase NEU3 in the cardiac response to ischemia and reperfusion injury. 2018. Poster. OSR Retreat, Baveno (VCO).

Sara D'Imperio, Liudmila Zakharova, Guy S. Cook, and Christopher A. Bradley**.** Characterization of Tissue- and Specific ECM-based gels for 3D cells microenvironment. 2017. Poster. International Society for Stem Cell Research (ISSCR), Boston, Massachusetts.

Liudmila Zakharova, **Sara D'Imperio**, Guy S. Cook, and Christopher A. Bradley**.** A 100% allograft ECM- based gel as a platform for generating 3D cell microenvironment. 2016. Poster. World Stem Cell Summit, West Palm Beach, Florida.

R. Hugh F. Bender, **Sara D'Imperio**, Matthew Wortham, Roberto Gaetani, Karen L. Christman, Maike Sander, Christopher C. W. Hughes. Developing a Biomimetic Pancreas-on-a-Chip for Ex Vivo Islet Studies. 2016. Poster. Human Islet Research Network Annual Investigator Meeting, Bethesda, Maryland