Curriculum vitae

PERSONAL INFORMATION

Family name: **Plebani Roberto**
ORCID ID: **0000-0003-1017-6440**
Date of birth: **1985/02/21**
Nationality: **Italian**

EDUCATION

03/17/2016 - PhD in Biomolecular Sciences - Department of Medical, Oral and Biotechnological Sciences (DSMOB), "G. d'Annunzio" University of Chieti-Pescara (UNICH), Italy. Thesis title: Vascular Endothelial Cells in Cystic Fibrosis. Supervisor's name: Prof. Mario Romano

09/16/2009 – Master's degree in Biomolecular and Biofunctional Sciences. University of Camerino, Italy

CURRENT POSITION

08/01/2019 - To date - Assistant professor of General Pathology at the DSMOB, Laboratory of Molecular Medicine, Center for Advanced Studies and Technologies (CAST), UNICH, Italy.

PREVIOUS POSITIONS

01/01/2016 – 07/31/2019 – Post doc at the DSMOB, UNICH, Italy.

01/01/2013 – 12/31/2015 - Ph.D. student at the DSMOB, UNICH, Italy.

08/01/2010 – 07/31/2012 - Research fellow at the Department of Oncology and Experimental Medicine, Laboratory of Oncologic Pathology, UNICH, Italy.

FELLOWSHIPS AND PERIODS ABROAD

06/30/2023 – 07/11/2023 – Visiting scholar at Department of Pediatrics, University of Chicago (UCHICAGO), IL, USA.

05/23/2022 – 07/05/2022 – Visiting scholar at the Department of Microbiology, Mass General Hospital (Harvard University), Boston, MA, USA.

03/18/2020 – 04/30/2021 – Visiting scholar at the Wyss Institute for Biologically Inspired Engineering (Harvard University), Boston, MA, USA.

SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS

2022 - 2023 - Supervision of graduate student (thesis ongoing)

Student's name: Luis Antonio Baeza Gonzales. Thesis title: L'UTILIZZO DELLE TECNOLOGIE CRISP/CAS9 E ORGAN-ON-A-CHIP PER LA VALUTAZIONE DELLA RISPOSTA IMMUNO-INFIAMMATORIA IN FIBROSI CISTICA

2018 - 2019 - Supervision of graduate student

Student's name: Alessandra d'Alessandro. Thesis title: ISOLAMENTO E CARATTERIZZAZIONE DELLE CELLULE MICROVASCOLARI DA ESPIANTI POLMONARI: RILEVANZA PER LA FIBROSI CISTICA

2017 - 2018 - Supervision of graduate student

Student's name: Simone Castagnozzi. Thesis title: MANIPOLAZIONE DEL GENE CFTR MEDIANTE LA TECNICA DEL CRISPR/CAS9.

TEACHING ACTIVITIES

07/05/2023 - Teaching activity (Moderator of undergrad fellowship program) to the undergraduate students – The University of Chicago, IL, USA.

2022-2023 - Teaching activity in General Pathology to the undergraduate students in "TECNICHE DI FISIOPATOLOGIA CARDIOCIRCOLATORIA E PERFUSIONE CARDIOVASCOLARE" (UNICH).

2022-2023 - Teaching activity to the students at the School of Specialization in Clinical Biochemistry (UNICH): "Organ-on-a-chip technology for preclinical and diagnostic studies".

05/10/2023 - Teaching activity (ADE) to the undergraduate students in medicine (UNICH). Title: "Cell isolation from surgical human specimens".

05/02/2023 and 05/26/2022 - Teaching activity (ADE) to the undergraduate students in medicine (UNICH). Title "3D cultures: the new frontier for modeling diseases and for personalized medicine".

EDITORIAL ACTIVITY

Guest editor for the International Journal of Molecular Sciences (IJMS). Title of the special issue: New Molecular Therapeutic Approaches for Cystic Fibrosis.

Reviewer editor for "Frontiers in Immunology, section: Viral Immunology".

MEMBER OF SCIENTIFIC SOCIETIES

- Member of Italian Society of Pathology and Translational Medicine (SIPMET)
- Member of the Italian Society of Translational Research and Health Professions (SIRTEPS)

MAJOR COLLABORATIONS

Laurence G. Rahme - Professor of Surgery, Microbiology - Massachusetts General Hospital, Harvard University, Boston, MA, USA. – Collaboration in the irway-on-a-chip

Longlong Si - Professor of Synthetic Biology and Virology - Chinese Academy of Sciences, Shenzhen, China & University of Chinese Academy of Sciences, Beijing, China.

Claudio Sorio - Professor of General Pathology - University of Verona, VR, Italy

Anna Stejskalova - Researcher at the Wyss Institute - Harvard University, Boston, MA, USA.

Andrea Piunti - Assistant Prof. of Pediatrics. - Biological Sci Division, UCHICAGO, IL, USA.

CURRENT RESEARCH GRANTS

Winner of the "Gianni Mastella Starting Grant (GMSG)" from the Italian CFF. **Title:** "Cystic Fibrosis Airway-on-a-Chip 2.0: A New Paradigm for Preclinical Drug Testing and Studies on Inflammation". **Duration:** 3 years (09/01/2023 – 08/31/2026). **Grant's code:** GMSG#1/2023. **Amount:** 151,583 €.

External collaborator (significant contributor) in a NIH grant. **Title:** "A comprehensive investigation of Pseudomonas quorum sensing regulatory relationships and the consequences on quorum sensing inhibitors in complex communities". **Grant's code:** 1R01AI177555- 01 (**PI:** Laurence G Rahme).

ADDITIONAL INFORMATION

Staff member of the "organ-on-a-chip" facility at the UNICH, Italy.

TRACK RECORD

Roberto Plebani started doing research on August 1st 2010, when he was awarded a two-year fellowship to carry the project "New markers, diagnostic tests and care for cancer in men" at the UNICH. During this period, he learned all the basic wet lab techniques and reached his first publication as first author *(Neoplasia - 2012)*. He joined the field of Cystic Fibrosis (CF) during his PhD, in 2013, in the laboratory of Molecular Medicine (UNICH), where he was leader of a project that led to the first isolation and purification of pulmonary artery endothelial cells (PAECs) from lungs explanted to people with CF *(Lab. Invest. 2017)*. He also took part in studies on CF endothelial dysfunction *(BBA – Mol. Basis of Dis. 2017)* and the impact of type-4 phosphodiesterase inhibition on NETosis in CF (*Front Immunol, 2021*). He was awarded Assistant Professor of General Pathology in 2019. He spent over one year at the Wyss Institute (Harvard) to learn the organ-on-chip technology and model the first CF airway-chip, composed of a CF pseudostratified human bronchial epithelium and a microvascular endothelium, interacting with neutrophils and bacteria, aimed to the study of inflammation in CF (*J Cyst Fibros, 2021*). During that period, he was involved in studies on influenza A and coronaviruses using the lung-chips *(Nat Biomed Eng, 2021; Nat Comm, 2022)*, and on the modeling on-chip of a vaginal tissue (*Microbiome, 2022*). Collaborations with former colleagues led to the generation of an influenza A vaccine by proteolysis targeting (*Nat. Biotech, 2022*). He has been invited to return to Harvard to train a team of a microbiology lab at the MGH to culture and infect the airway-chip with *P. aeruginosa* and further optimize the infection conditions. He is still collaborating with Prof. Rahme's Lab at the MGH as an external collaborator in an NIH project. In July 2023, He spent a 2-week visiting period at UCHICAGO, where he gave a seminar at the department of Pediatrics, took part of scientific discussions, meeting and moderated a student at an undergrad fellowship program. He was funded by the Italian Cystic Fibrosis Foundation (CFF) in the perspective of constructing a "full CF" lung airway-on-a-chip, which will also include CF endothelial cells and fibroblasts. He is currently working on this project in collaboration with colleagues at the Wyss Institute, where he spent an additional four-month visiting period from January to May 2024.

SEMINARS and TALKS

- **03/25/2024 – Talk at the Wyss Institute (Harvard University) –** Title: The Cystic Fibrosis Airway-on-a-chip 2.0
- **11/23/2023 – Speaker at the 21th FFC Convention** organized by the Italian Cystic Fibrosis Foundation. Title: Developing a new respiratory 3D model as an innovative strategy to study the inflammation pathology in cystic fibrosis.
- **11/22/2023 – Speaker at the Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise "Giuseppe Caporale".** Title of the workshop: "Metodiche alternative alla sperimentazione animale". Title of the talk: "La tecnologia dell'organ-on-a-chip: un'applicazione nello studio delle malattie respiratorie e ulteriori possibili declinazioni"
- **07/10/2023 – Speaker upon invitation at the Department of Pediatrics, University of Chicago**:

Title of the Talk: From Conventional Cell Cultures to the Organ-on-a-Chip Technology

- **06/09/2023 – Speaker upon invitation at AITIC** (Italian Association of Histology and Cytology Technicians). Session: Current Models in Disease Research & Drug Development. Title of the Talk: Organ-on-a-chip Technology for Modeling Human Diseases.
- **03/23/2022 – Speaker upon invitation at the MGH** (Harvard Medical School, Boston, MA, USA). Network Seminar Series: "Microbes in Health, Infection & Treatment (MHIT)". Title of the talk: "Endothelial Cell Dysfunction in Cystic Fibrosis"
- **12/01/2022 – Speaker at 34th AICC** (Italian Cell Culture Association) annual conference - University of Campania (Naples, Italy). Title: "Modeling Cystic Fibrosis in a Human Lung Airway-on-a-Chip"

MOST RELEVANT PUBBLICATIONS (10)

- ***Microvascular and Macrovascular Endothelial Cell Isolation and Purification from Lung-Derived Samples***. *Journal of Visualized Experiments*. 2023. (**Plebani R**, D'Alessandro A, Lanuti P, Simeone P, Cinalli M, Righi I, Palleschi A, Mucci M, Marchisio M, Cappabianca F, Camera M, Mucilli F, Romano M).
- ***Vaginal microbiome-host interactions modeled in a human vagina-on-a-chip.*** *Microbiome 2022.* (Mahajan G, Doherty E, To T, Sutherland A, Jennifer Grant J, Junaid A, Gulati A, LoGrande N, Izadifar Z, Sharma S, Horváth V, **Plebani R**, France M, Hood-Pishchany I, Rakoff-Nahoum S, Kwon D, Goyal G, Prantil-Baun R, Ravel J, Ingber DE).
- ***Generation of a live attenuated influenza A vaccine by proteolysis targeting.*** *Nature Biotechnology.* 2022. (Si L, Shen Q, Li J, Chen L, Shen J, Xiao X, Bai H, Feng T, Ye A Y, Li l, Zhang C, Li Z, Wang P, Oh C Y, Nurani A, Niu S, Zhang C, Wei X, Yuan W, Liao H, Huang X, Wang N, Tian W-X, Tian H, Li L, Liu X, **Plebani R**).
- ***Mechanical control of innate immune responses against viral infection revealed in a human lung alveolus chip.*** *Nature Communications*. 2022. (Bai H, Si L, Jiang A, Belgur C, Zhai Y, **Plebani R**, Oh CY, Rodas M, Patil A, Nurani A, Gilpin SE, Powers RK, Goyal G, Prantil-Baun R & Ingber DE).
- ***Modeling Pulmonary Cystic Fibrosis in a Human Lung Airway-on-a-chip.*** *Journal of Cystic Fibrosis*. 2022. **(Plebani R**, Potla R, Soong M, Bai H, Izadifar Z, Jiang A, Travis RN, Belgur C, Dinis A, Cartwright MJ, Prantil-Baun R, Jolly P, Gilpin SE, Romano M, Ingber DE).
- ***A human-airway-on-a-chip for the rapid identification of candidate antiviral therapeutics and prophylactics.*** *Nat Biomed Eng*. 2021. (Si L, Bai H, Rodas M, Cao W, Oh C, Jiang A, Moller R, Hoagland D, Oishi K, Horiuchi S, Uhl S, Blanco-Melo D, Albrecht R, Liu W, Jordan T, Nilsson-Payant B, Golynker I, Frere J, Logue J, Haupt R, McGrath M, Weston S, Zhang T, **Plebani R**, Soong M, Nurani A, Kim SM, Zhu D, Benam K, Goyal G, Gilpin SE, Prantil-Baun R, Gygi SP, Powers RK, Carlson KE, Frieman M, tenOever BR, Ingber DE).
- ***Establishment and long-term culture of human cystic fibrosis endothelial cells.*** *Lab Invest.* 2017 (**Plebani R,** Tripaldi R, Lanuti P, Recchiuti A, Patruno S, Di Silvestre S, Simeone P, Anile M, Venuta F, Prioletta M, Mucilli F, Del Porto P, Marchisio M, Pandolfi A, Romano M).
- ***Type-4 Phosphodiesterase (PDE4) Blockade Reduces NETosis in Cystic Fibrosis.*** *Frontiers in Pharmacology*. 2021. Totani L, Amore C, Piccoli A, Dell'Elba G, Di Santo A, Plebani R, Pecce R, Martelli N, Rossi A, Ranucci S, De Fino I, Moretti P, Bragonzi A, Romano M, Evangelista V).
- ***Mechanisms of endothelial cell dysfunction in cystic fibrosis.*** *Biochim Biophys Acta Mol Basis Dis*. 2017. (Totani L, **Plebani R**, Piccoli A, Di Silvestre S, Lanuti P, Recchiuti A, Cianci E, Dell'Elba G, Sacchetti S, Patruno S, Guarnieri S, Mariggiò MA, Mari VC, Anile M, Venuta F, Del Porto P, Moretti P, Prioletta M, Mucilli F, Marchisio M, Pandolfi A, Evangelista V, Romano M).
- ***Long-range transcriptome sequencing reveals cancer cell growth regulatory chimeric mRNAs.*** *Neoplasia.* 2012. (**Plebani R**, Oliver GR, Trerotola M, Guerra E, Cantanelli P, Apicella L, Emerson A, Albiero A, Harkin PD, Kennedy RD, Alberti S).

06/10/2024

Roberto Plebani