# CORINNA BARELLA

## PROFILE

Student with good knowledge in the biomedical field and great motivation to grow professionally. Strong interest in research concerning the development of biomaterials for applications in personalized medicine. Ability to be able to face new problems and manage practical activities.

## PERSONAL DATA

**Birthday:** November 24$^{th}$, 1999
**Nationality:**
**Address:**

## CONTACTS

**Phone number:**

**E-mail:**

## SOFTWARE

- Microsoft Office (Word, Excel, PowerPoint)
- MATLAB
- Simulink
- Python
- R
- C/C++
- ImageJ
- Motion Studio
- Latex

## LANGUAGES

**Italian** Native
**English** Intermediate (B2 Level)

## EDUCATION

**Doctor of Philosophy - PhD, Bioengineering**      2024 - 2027
University of Genoa, Italy

**Master's degree in Bioengineering - Materials and devices for Personalized Medicine**      2021 - 2023
*with the final evaluation of 110/110 with honors*
University of Genoa, Italy

**Bachelor's degree in Biomedical Engineering**      2018 - 2021
*with the final evaluation of 107/110*
University of Genoa, Italy

**Science High School Diploma**      2013 - 2018
*with the final evaluation of 90/100*
IISS Fortunio Liceti, Rapallo, Italy

## PROFESSIONAL EXPERIENCE

March 2023 - December 2023

**Research Trainee for the Master Thesis** - University of Genoa, Italy
The master thesis project deals with the development and the characterization of 3D bioprinted *in vitro* brain tissue models. To do that it is developed an ad-hoc bioink that will be used to create compartmentalized 3D neuronal co-cultures using gabaergic and glutamatergic neurons differentiated from human induced pluripotent stem cells (iPSc) co-coltured with astrocytes. The 3D constructs are characterized by immunocytochemistry and by electrophysiological recordings.

June 20$^{th}$ - 24$^{th}$, 2022

**Research track on biomaterials** - University of Genoa, Italy
The experience was based on the in vitro analysis of induced pluripotent stem cells (iPSc) differentiated into human neurons. The activity included the thawing of the cells, the creation of an environment that allowed maximum cell propagation, the count of live cells after all the passages, the fixing of the cells, the marking of specific components of the cells using a primary antibody and a secondary antibody labeled with a fluorophore, and the labeling of cell nuclei with DAPI. The cells were examined through a fluorescence microscope with different objectives (10x, 20x, 50x), exciting the sample with different wavelengths, to visualize different components. The second part of the laboratory involved the creation of a calcium alginate gel through an exogenous method which consists in the spherification of the alginate. For this purpose, an instrument was used which, working under pressure, extrudes the sodium alginate solution in calcium chloride ($CaCl_2$).
Finally, it was explained to me the operation of a Bioprinter, and I participated at the extrusion of a biopolymer material via a pneumatic print head.

March 2021 - September 2021

**Experimental thesis base on electroencephalographic analysis in patients with REM Sleep Behavior Disorder (iRBD).**
The thesis aimed to underline the variation of the spectral profile and the phase synchronization between iRBD patients and control subjects, to detect any alterations in the brain network and to study the disease on a pathophysiological basis. For this purpose, my role was to apply a sequence of methodologies that would allow to underline the differences between the two groups: I investigated the spectral profile and phase synchronization, checking that the results of the analyzes were statistically significant through a student's t-test, using Python software.

September 2021 - December 2023

**Projects during master's period**

- Development of two mathematical models of the mechanics of biological tissues: a continuum model to analyze the flow of fluids and the mechanics of the retinal tissue in the presence of macular edema; and a model to understand the flow generated by the movement of a prey in the water and to analyze how it is perceived by the sensory system of a predator located at a certain distance.
- Theoretical design of biosensors for the detection of dopamine, glutamate, lactic acid, and calcium ion. On this field, I have also done a laboratory on amperometric enzymatic biosensor operation for glucose detection.
- The application of Bioinformatic methods for proteins data analysis: in particular, of the Isoleucyl-tRNA synthetase and Tryptophanyl-tRNA synthetase complexes, using R software.
- Application in Biomedical Imaging field: binary masks, spot noise and histogram equalization, cell counting, Fourier transform of images and filtering in Fourier domain, rigid co-registration of two MRI volumes based on fiducial points and on mutual information and filtered back-projection algorithm. For these aims it was used MATLAB and ImageJ software for the elaboration of the images.
- Analysis of microstructure in EEG signals: to investigate how the microstate series may reflect rapid switching among neural networks while the brain is at rest. For this purpose, it was used MATLAB software.
- Robotics applications: the construction of DC motor model using Simulink; mapping joint angles of a two degree-of-freedom linkage to end-effector position (forward kinematics), and vice versa (inverse kinematics), using MATLAB; finally, the design of a reaching task and of a controller for a planar manipulator using different force fields.

September 2018 - September 2021

**Projects during bachelor's period**

- Processing of ECG (Electrocardiogram), EEG (electroencephalogram) and EMG (electromyogram) data, using MATLAB.
- Gait biomechanics analysis: ground reaction forces over time, in the gait cycle and in its fundamental instants, using MATLAB.
- Laboratory of fluids dynamics and the analysis of Lagrangian trajectories with PTV (Particle Tracking Velocimetry) method using Motion Studio Software.
- Laboratory of biomaterials based on compression tests on Brushite samples, using an universal electro-mechanical machine for mechanical tests.

## LANGUAGE COURSES

September 2021 - December 2021

- A quarter University course and its exam of B2 level of English Language.

September 15th - 21st, 2017, Dublin

- A general English Language Course with 20 hours of study per week at ISI Dublin completed with an overall level of B2.

September 21st - 27th, 2016, Edinburgh

- To attend a Young Learner Course (A2) for 20 hours at Center of English Studies of Edinburgh.

September 14th - 18th, September 2015, London

- General English Tuition (20 lessons per week) in Language Teaching Center London, completing my studies at the pre-intermediate level.