

Simona Cesaroni

WORK EXPERIENCE

Internship

Laboratory of Nuclear Magnetic Resonance and Mass Spectrometry at the University of "Tor Vergata" [04/2022 – 02/2024]

Address: Via della Ricerca Scientifica 1 Department of Chemical Sciences and Technologies, 00133 Rome (Italy)

- Optimization of deproteinization procedures (ultrafiltration and precipitation) for blood plasma samples intended for applications in the field of metabolomics.
- Analysis and comparison of the metabolic and lipid profiles of blood serum samples from patients with Takotsubo Syndrome and myocardial infarction using 1H-NMR one-dimensional and two-dimensional (TOCSY) spectroscopy.
- Development of an experimental procedure for the preparation and analysis of the metabolic profile of saliva samples from patients with Sarcopenia using 1H-NMR one-dimensional spectroscopy.
- Exometabolomic analysis of Cholangiocarcinoma cell cultures using 1H-NMR one-dimensional spectroscopy.
- Utilization of a Bruker Avance 700 MHz spectrometer equipped with an automatic SampleXpress Lite sampler.
- Use of the following software: Topspin for the acquisition and processing of one-dimensional and twodimensional NMR spectra; Chenomx NMR Suite for the identification and quantification of metabolites through a manual deconvolution procedure of spectra; ACD Labs for automated processing of spectra through a binning procedure; SIMCA® for applications of multivariate data analysis methods.
- Enhancement of skills in using the Microsoft Office suite, particularly Excel, PowerPoint, and Word.

EDUCATION AND TRAINING

Master's Degree in Chemistry

University of Rome "Tor Vergata" [2018 - 2024]

City: Rome | **Country:** Italy | **Final grade:** 110/110 cum Laude | **Level in EQF:** EQF level 7 | **Thesis:** "Study of the metabolism of cholangiocarcinoma cells in 2D and 3D cultures using NMR spectroscopy"

- Application of an exometabolomic method through acquisition of 1H-NMR one-dimensional spectra from cell cultures to assess differences in metabolic profiles between cells grown in monolayer (2D) and spheroids (3D).
- Assignment and quantification of metabolites using manual deconvolution procedures of spectra (software used: Chenomx NMR Suite).
- Application of supervised and unsupervised multivariate statistical analysis methods (software used: SIMCA®).
- Biochemical analysis of cellular pathways implicated in metabolic differences.

Bachelor's Degree in Chemistry

University of Rome "Tor Vergata [2008 - 2017]

City: Rome | **Country:** Italy | **Final grade:** 108/110 | **Level in EQF:** EQF level 6 | **Thesis:** "Characterization using spectroscopic and electrochemical techniques of thin films obtained through self-assembly of bio-inspired molecules"

- Construction through a bottom-up approach of two multilayer thin film systems composed of lipoic acid, tetraphenylporphyrin, and tricogin, functionalized with adenine (A) and thymine (T) (Lipo-A-T-ZnTPP and Lipo-A-T-Tr(Lys)-A-T-ZnTPP), deposited on gold electrodes.
- Spectroscopic characterization in solution of the *building blocks* and on the surface of the deposited films, using UV-visible absorption spectroscopy, static fluorescence spectroscopy, and infrared reflection-absorption spectroscopy (IR-RAS).
- Investigation of electron transfer efficiency in the two systems through photoinduced current measurements for potential applications in the field of molecular electronics.
- Utilization of the Kaleidagraph software for data analysis.

PUBLICATIONS

[2019]

Building Supramolecular DNA-Inspired Nanowires on Gold Surface: from 2D to 3D Gatto, E., Kubitzky, S.,

Schriever, M., Cesaroni, S., Mazzuca, C., Venanzi, M., De Zotti, M. Building Supramolecular DNA-Inspired Nanowires on Gold Surface: from 2D to 3D. *Angewandte Chemie - International Edition* 58, 7308–7312 (2019)