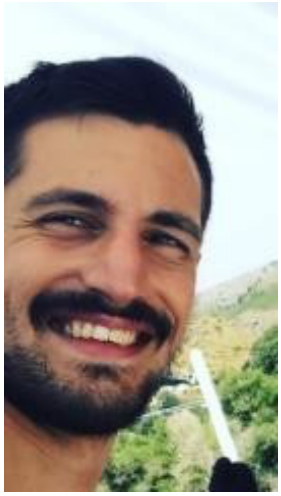
CURRICULUM VITAE

NICOLAS BINETTI

PERSONAL DATA:



Date of birth: May, 24th 1996

Place of Birth: Novara (NO), Piedmont, Italy

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EDUCATION:

1. *2015*, Scientific High school diploma at “IIS Biagio Pascal”, Romentino (NO), Italy.

2. *2018*, Bachelor Degree in Biological Sciences at the University of Eastern Piedmont Amedeo Avogadro.
   - Thesis Title “La tecnica della fish e le sue applicazioni in oncoematologia”
   - Supervisor Prof. Simona Martinotti
   - 101/110

3. *2021*, Master degree in Molecular Biology and Genetics at the University of Pavia (PV), Italy.
   - Thesis Title "Proteomic analysis of fetal and perinatal stem cell secretome (CM) and extracellular vescicles (EVs) to investigate their regenerative potential"
   - Supervisor Prof. Paolo Iadarola
   - 108/110

WORK EXPERIENCE AND SCIENTIFIC ACTIVITY:

1. *From May, 9th 2018 to August, 8th 2018*

   I frequented the Oncoematology Laboratory coordinated by the Doctor Corrado Tarella at the European Institute of Oncology (IEO) in Milan, for the thesis internship planned by the Bachelor Degree course.

   During this period, I attended at the analysis of the samples derived from the oncologic patients (blood, bone marrow samples) under the supervision of Dr. Chiara Corsini (Biologist), with the aim of providing a diagnosis that would be helpful for the Doctors to provide an adequate therapy.

   In particular my project aimed at the developing of a compilative study in which we described the Fluorescence *in situ* Hybridization technique (also called FISH) applied to the cells derived from the already cited samples.

   In doing this, we used different DNA probes selected in regard to the pathology under exam (Acute Lymphoblastic leukemia or LLA, Chronic Lymphoblastic leukemia or CLL, Multiple myeloma or MM ect…) and therefore we were able to predict a bad or good prognosis based on the mutation implicated for the corresponding pathology.

   The setup of the experimental protocol allowed me to gain expertise in cell cultures, karyotypes, culture media, Neubauer chamber, selection of particular cell types through immunomagnetic beads columns, hybridization with DNA probes for specific mutations, Fluorescence microscope Olimpus BX and therefore image processing. Moreover, I gained insights in Flow cytometry, dewaxing of paraffinated samples, analysis of chimerism after transplant to patients of allogeneic hematopoietic stem cells (always exploiting FISH), in this way evaluating the success or failure of the donor cells "attachement" and course of the pathology.

2. *From January 2019 to June 2021,*

   I frequented the Proteomic and Metabolomic Laboratory at the ITB-CNR (LITA) in Segrate (Milan) directed by the Dr. Pierluigi Mauri. Here, I mainly worked under the guide of Dr. Antonella De Palma. This group in fact, was collaborating with my Prof. and Supervisor Paolo Iadarola from the University of Pavia.

   In particular, for my experimental thesis, we worked in collaboration with the

Regenerative Medicine group of the University of Genova guided by Dr. Sveva Bollini.
My project aimed at unveiling the key molecular mechanism(s) underlying functional restoration of cardiac endogenous regenerative programme by using human amniotic fluid stem cell-derived paracrine factors with promising potential for clinical translation in the field of Cardiovascular diseases (CVDs).
For this, we wanted to study human amniotic fluid stem cells (hAFSCs) of Fetal (II trimester) and Perinatal (III trimester) derivation by means of a shotgun label-free platform (coupling of nano liquid chromatography and high-resolution mass spectrometry nLC-hrMS). These are Mesenchymal stem cells (MSCs) and from literature are reported to carry a high regenerative potential.
These type of cells were cultured under normoxic and hypoxic pre-conditioning.
We also performed a comprehensive and detailed characterization of II versus III trimester hAFS secretome formulations, in order to address the influence of gestational stage and hypoxic cell preconditioning on secretome characteristics.
In particular, we were interested in the the fetal stem cell secretomes (CMs) and extra-cellular vesicles (EVs) contents, after the hypoxic pre-conditioning because this last condition provided, in its proteomic content, a high percentage of proteins corresponding to paracrine factors involved in cardioprotection, angiogenesis, normal heart development, potential regeneration in infarcted myocardium as wells as protein biomarkers known to be found in Exosomes. Moreover, they could potentially be used as off-the-shelf and ready-to-use therapeutic options.
For this purpose, protein profiles for each examined condition, their differential analysis and stratification were produced and analysed to quantitatively examine the proteomic changes and the molecular processes involved, to better select the secretome formulations considering the specific clinical scenario and to identify potential proteins involved in myocardial rejuvenation mechanism.
The setup of the experimental protocol allowed me to gain expertise in protein in-solution digestion and peptide purification, calibration of nanoLiquid chromatography coupled to High resolution Mass spectrometry (nLC-hrMS) in particular Eksigent Ekspert nanoLC 415 and LTQ Orbitrap XL ETD^{TM} mass spectrometer a hybrid FT instrument which combines a linear ion trap and the Orbitrap mass analyzer, equipped with a nano spray ion source, computer and software databases like Xcalibur data system software version

2.0.7, Proteome Discoverer software version 2.1, The ITB-CNR home-made MAProMa tool (Multidimensional Algorithm Protein Map), The JMP 15, statistical analysis software produced by SAS Institute, for linear discriminant analysis (LDA), The FunRich software version 3.1.3, a stand-alone tool used for functional enrichment and interaction network analysis of genes and proteins, The String web resource and online database version 11.0 (Search Tool for the Retrieval of Interacting Genes/Proteins).

3. *From September 2021 to June 2022*

   I participated in the Erasmus Traineeship program where I worked in the University of Barcelona (Spain) in the Molecular Neurobiology Laboratory headed by the Dr. Rafael Fernandez Franco. Here I studied G-protein coupled receptors (GPCRs) their pharmacology and involvement in the nervous system.

   In particular I focused on the formation of heterodimers and their interaction with different compounds, also studying their second messenger signaling inside the cell.

   This experience allowed me to gain expertise in cell cultures (mainly HEK-293), Polymerase chain reaction (PCR), Bioluminescence Resonance Energy Transfer (BRET), Forster Resonance Energy Transfer (FRET), cyclic AMP (cAMP) assay.

   I also participated in the publication of an article named "Targeted Metabolomics Shows That the Level of Glutamine, Kynurenine, Acyl-Carnitines and Lysophosphatidylcholines Is Significantly Increased in the Aqueous Humor of Glaucoma Patients" giving my contribution for managing of data, figures and table construction and statistical analysis.

LABORATORY SKILLS:

- Good Fluorescence and Optic Microscope ability.
- Basic skill knowledge in using nanoLiquid chromatography coupled to Mass Spectrometry.
- General cell culture techniques.
- Cell Transfection.
- Molecular biology techniques: PCR amplification, protein purification, Western blot.

DIGITAL COMPETENCE:

- Good knowledge of Microsoft Office (Word, Excel, PowerPoint)
- Basic knowledge of GraphPad Prism Software
- Basic knowledge of Xcalibur data system software version 2.0.7
- Knowledge of Proteome Discoverer software version 2.1
- Basic knowledge of JMP 15, statistical analysis software produced by SAS Institute, for linear discriminant analysis (LDA)
- Knowledge of the FunRich software version 3.1.3, a stand-alone tool used for functional enrichment and interaction network analysis of genes and proteins
- Knowledge of the String web resource and online database version 11.0 (Search Tool for the Retrieval of Interacting Genes/Proteins)
- Knowledge of DAVID Functional Annotation Bioinformatics Microarray Analysis

COURSES:

1. Course of general training for health and safety for workers
2. Course for the management of safety in laboratories

PUBLICATIONS:

- Lillo A, Marin S, Serrano-Marín J, Binetti N, Navarro G, Cascante M, Sánchez-Navés J, Franco R. Targeted Metabolomics Shows That the Level of Glutamine, Kynurenine, Acyl-Carnitines and Lysophosphatidylcholines Is Significantly Increased in the Aqueous Humor of Glaucoma Patients. Front Med (Lausanne). 2022 Jul 22;9:935084. doi: 10.3389/fmed.2022.935084. PMID: 35935793; PMCID: PMC9354463.

-Lillo A, Marin S, Serrano-Marín J, Bernal-Casas D, Binetti N, Navarro G, Cascante M, Sánchez-Navés J, Franco R. Biogenic Amine Levels Markedly Increase in the Aqueous Humor of Individuals with Controlled Type 2 Diabetes. Int J Mol Sci. 2022 Oct 22;23(21):12752. doi: 10.3390/ijms232112752. PMID: 36361545; PMCID: PMC9658658.

FOREIGN LANGUAGES

Very good knowledge of written and spoken English, discrete knowledge of written and spoken Spanish.

Hereby authorize the treatment of my personal data according to the Italian Legislative Decree no. 196 dated 30/06/2003 and to art. 13 GDPR (EU Regulation 2016/679) for the purpose of recruiting and selecting staff.