Clara Vianello

Molecular and cellular biologist

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Work Experience

Fellowship
Department of surgical and medical sciences of Bologna (DIMEC), titled
"*Investigating Negr1 as a novel treatment target in major depression disorder*"
15th March 2022 to 14th March 2023 (Actually 9 months)

The project, for which I'm working, is focused on the importance of the expression profile of Negr1, a gene related to major depressive disorder. The aim it is to investigate the alterations in the expression profile of Negr1 and IgLONs genes in a mouse model of major depressive disorder based on the exposure to unpredictable chronic mild stress (UCMS). The efficacy of the UCMS protocol to induce the pathology is validated by a panel of behaviour test, meanwhile the qPCR and the Western Blot are the assay chosen for studying the expression profile of genes and proteins.

Internship for Master degree in physical chemistry
Alma mater studiorum - University of Bologna
"*High spatial resolved determination of metabolites: glucose and lactate*"
February 2021 to September 2021 (7 months)

With the aim of evaluating the metabolic phenotype of cancer cells and their eterogeneity, we have realised biosensor used as probes for the Scanning Electrochemical Microscopy (SECM). The SECM is an innovative technique for a high spatial resolved determination of metabolites in different sample, for example in cell colture, in 3D cell colture in which cells are bioprinted in a gel matrix or directly inside tissue. Focalizing the attention on the Warburg effect, we have measured the concentration of two metabolic markers of cancer like glucose and lactate in this three different samples.

Internship for Bachelor degree in molecular biology
University of Ferrara
"*Trans splicing at 3' end of the exon 2 of the SBDS gene*"
February 2019 - June 2019 (5 months)

The aim of this thesis project was to create a molecule named PTM (pre-trans-splicing molecules) that is able to induce effectively and selectively the process of trans-splicing at the 3' ends of the exon target. With this molecular mechanism it is possible to replace the portion of SBDS gene after the exon 1 with the GFP's gene, obtaining a final construct consisting of SBDS ex1 and the fluorescent reporter GFP. By exploiting the reporter protein it will be possible to quickly determine which PTMs with the greatest efficiency in inducing trans-splicing. According to this technology it will be possible to replace the region of the SBDS gene in which are located more frequent mutations that lead to the phatology.

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Education History

Bachelor degree in biotechnology
University of Ferrara
September 2016 - July 2019
- 110/110 cum Laude

Master degree in molecular e cellular biology
Alma mater studiorum - università di Bologna
September 2019 - October 2021
- 110/110 cum Laude

Awards and certifications

Eligibility for the award for master's degree thesis aimed at promoting alternative methods to the use of animals pursuant to art. 1, paragraph 2 TER of the Regional Law 20/2002 and subsequent amendments - Regional Decree 250/2022
Pending publication of the ranking list (31/12/2022)

In my thesis project I've measured the cancer metabolites, glucose and lactate, also in a 3D colture in which cells were printed in a alginate matrix. This type of samples could be a great alternative methodologies of research to the use of animals because it allows to recreate in vitro the tumoral microenvironment more similar to the physiological ones rather than cellular colture in vitro (2D).

IELTS English Certification - B2 Level
Februaury 2021

Teaching qualification (24 CFU)
March 2022

Online courses by Bio-Rad

Fundamentals of RT-qPCR
Course 1: Introduction to RT-qPCR and Gene Expression
Course 2: RNA Sample Preparation Considerations
Course 3: Experimental Design for Gene Expression by RT-qPCR
Course 4: Assay Optimization for RT-qPCR
Course 5: Gene Expression Analysis by RT-qPCR

Fundamentals of Western Blotting
Course 1: Sample Preparation
Course 2: Gel Electrophoresis and Transfer
Course 3: Immunodetection
Course 4: Image Acquisition
Course 5: Image Analysis

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Relevant skills

In vitro:

- DNA and RNA extraction from cells and tissue
- Primer design
- PCR
- RT-PCR
- qPCR
- Agarose electrophoresis for acid nucleic separation
- Spectrophotometer
- Ligation
- TA Cloning
- Bacterial transformation
- Liquid bacterial cultures
- Digestion with restriction enzymes
- Transfection into HEK293T cells
- Realization of enzymatic biosensors to be used as electrochemical probes for the scanning electrochemical microscopy (SECM).
- Optimization of specific biosensor in order to detect the concentration of glucose and lactate inside biological samples.
- Cell coltures
- Protein isolation from tissues
- BCA assay
- Western Blot
- Immunohistochemistry
- Blood collection for the investigation of circulating biomarkers

In vivo:

- Experience with animals by performing the unpredictable chronic mild stress (UCMS) protocol in order to create a mouse model of Major Depressive Disorder. Behaviour tests to validate the efficacy of the protocol on inducing the pathology.

Analysis programs:

- Office (Word, Excel, Power Point)
- SnapGene Viewer
- BLAST
- Origin Pro
- Fiji Imagej
- Image Lab
- In Vivo Stat
- SDS
- RQ Manager