Riccardo
Parra

CONTACT

WORK EXPERIENCE

06/04/2020 – CURRENT

Post Doctoral Fellow - Generation of genetically-encoded constructs to track the development of GBM in vivo

CNR Institute for Nanoscience

I generated genetically-encoded constructs for the *in vivo* tracking of oncogenic cells in their development of a Glioblastoma Multiforme (GBM) tumor in adult mice.

These constructs will be used to monitor *in vivo* the physiology (calcium activity) and the pathology (invasive capability) of tumor cells in adult mice.

Professional, scientific and technical activities / Pisa, Italy

06/04/2019 – 06/04/2020

External Collaborator at NEST - CNR Nanoscience - Publication finalization and mentoring

I came back to the Lab of Dr. Gian Michele Ratto to finalize a publication in which I'm a co-first author ("A Cre amplifier to generate and detect gentic mosaics in vivo", see Publications for details). In the meantime, I also mentored 2 graduate students and 1 undergraduate student.

Professional, scientific and technical activities

01/01/2019 – CURRENT

Student: HarvardX Data Science Professional Certificate

HarvardX

I attended the courses for the Data Science Professional Certificate (still ongoing).

To date I completed the modules:

Data Science: R Basics

https://courses.edx.org/certificates/36b26450e9a6407aa6948e3cb2d0aff2

Data Science: Visualization

https://courses.edx.org/certificates/203556a659654b93a41fbce786a32a91

Data Science: Probability

https://courses.edx.org/certificates/35a54e7e71624963bcaabb221a73239e

Data Science: Inference and Modeling

https://courses.edx.org/certificates/ba2221182feb4438ae230a0c2e22f26d

Data Science: Productivity Tools

https://courses.edx.org/certificates/61f25ae6baa94e33a01a247206aaaeb9

Education / Cambridge, MA, United States

28/09/2016 – 02/10/2018

Post Doctoral Associate: Development of a 3-dimensional human iPSC model (organoid) suitable for longitudinal live-imaging of synaptic structure using 2-photon microscopy

Yale University - School of Medicine

http://higleylab.org/people/

https://medicine.yale.edu/lab/vaccarino/people/

I generated 3D cultures of human brain cells and I followed their growth and development by means of 2-photon imaging. I performed all the procedures required from the iPS expansion up the whole organoid formation. With Molecular Biology techniques, I adapted commercially available genetically-encoded constructs to make them suitable to specifically label inhibitory synapses and excitatory synapses *in vivo*. Finally, I performed the deep layers 2-photon imaging of the alive organoids.

Acquired Skills: Induced Pluripotent Stem cells (iPS) expansion, development of human 3D brain organoids, 2-photon imaging on organoids.

Professional, scientific and technical activities / https://medicine.yale.edu/ / 333 Cedar Street - New Haven, CT 06510, New Haven, United States

01/09/2012 – 31/07/2016

Post Doctoral Fellowship: Generation and two-photon analysis of a sensor for Cre recombinase activity in vivo.

NEST - Istituto di Nanoscienze CNR

I generated the sensor through PCR amplifications, digestions with restriction enzymes and ligations. I assayed the activity of the sensor through two-photon *in vivo* imaging.

The sensor I generated is a sensor for Cre recombinase activity. The tool was realized to detect *in vivo* the presence of the intact MeCP2 gene in an MeCP2 floxed mouse model of Rett syndrome.

Rett syndrome is a rare disease caused by mutations in MeCP2 and since this gene is located on the X chromosome, due to the inactivation of the Barr body, cells of heterozigous females randomly block the expression either of the mutated allele or of healthy allele. This process creates the mosaic of healthy and diseased cells which causes the disease.

My tool is capable not only to create and reveal the mosaic *in vivo* by expressing GFP in healthy cells and a Red fluorescent protein in diseased ones, but it is also capable to amplify the Cre effect, so that the genomic floxed gene is cut with 100% of accuracy, avoiding the case of false positives.

It is worth noting that the tool is a sensor for Cre, so it is suitable to detect EVERY floxed gene. In addition, thanks to its amplifying effect, it can also be used it to induce and detect double or triple floxed recombinations, with very low doses of tamoxifen.

Finally, as a side project, I also used such molecular biology techniques to improve a genetically-encoded fluorescent Chloride sensor (ClopHensor) to visualize the intracellular Chloride currents *in vivo*. The sensor will be used to measure (for the first time *in vivo*) the shift in the role of GABA from excitatory to inhibitory, which occurs during development.

Acquired skills: *In vivo* two-photon imaging of intact mouse brain, *In vivo* plasmid iontoporation, Two-photon imaging, Brain slice preparation.

Professional, scientific and technical activities / http://www.laboratorionest.it/ / Piazza San Silvestro, 12, 56127, Pisa, Italy

01/01/2005 – 06/03/2013

Ph. D. project: Trafficking properties of ERK1 and ERK2 in neural cells