EUROPEAN SYNCHROTRON RADIATION FACILITY

INSTALLATION EUROPEENNE DE RAYONNEMENT SYNCHROTRON

Experiment Report Form

The double page inside this form is to be filled in by all users or groups of users who have had access to beam time for measurements at the ESRF.

Once completed, the report should be submitted electronically to the User Office via the User Portal:
https://wwws.esrf.fr/misapps/SMISWebClient/protected/welcome.do

Deadlines for submission of Experimental Reports

Experimental reports must be submitted within the period of 3 months after the end of the experiment.

Experiment Report supporting a new proposal ("relevant report")

If you are submitting a proposal for a new project, or to continue a project for which you have previously been allocated beam time, you must submit a report on each of your previous measurement(s):

- even on those carried out close to the proposal submission deadline (it can be a *"preliminary report"),*
- even for experiments whose scientific area is different form the scientific area of the new proposal,
- carried out on CRG beamlines.

You must then register the report(s) as "relevant report(s)" in the new application form for beam time.

Deadlines for submitting a report supporting a new proposal

- 1st March Proposal Round - **5th March**
- 10th September Proposal Round - **13th September**

The Review Committees reserve the right to reject new proposals from groups who have not reported on the use of beam time allocated previously.

Reports on experiments relating to long term projects

Proposers awarded beam time for a long term project are required to submit an interim report at the end of each year, irrespective of the number of shifts of beam time they have used.

Published papers

All users must give proper credit to ESRF staff members and proper mention to ESRF facilities which were essential for the results described in any ensuing publication. Further, they are obliged to send to the Joint ESRF/ ILL library the complete reference and the abstract of all papers appearing in print, and resulting from the use of the ESRF.

Should you wish to make more general comments on the experiment, please note them on the User Evaluation Form, and send both the Report and the Evaluation Form to the User Office.

Instructions for preparing your Report

- fill in a separate form for each project or series of measurements.
- type your report in English.
- include the experiment number to which the report refers.
- make sure that the text, tables and figures fit into the space available.
- if your work is published or is in press, you may prefer to paste in the abstract, and add full reference details. If the abstract is in a language other than English, please include an English translation.

ESRF	**Experiment title:** Microstructural characterization of the cellular and microvascular architectures of the somatosensory cortex in experimental models of chronic pain	**Experiment number**: MD-1199
Beamline: ID17	**Date of experiment**: 01 December 2018 / 03 December 2018	**Date of report**: 05/03/2020
Shifts: 6	**Local contact(s)**: Hervig Requardt	*Received at ESRF:*

Names and affiliations of applicants (* indicates experimentalists):

Gabriele E. M. Biella[1*], Antonio G. Zippo[1*], Paola Coan[3*], Alberto Bravin[2*]

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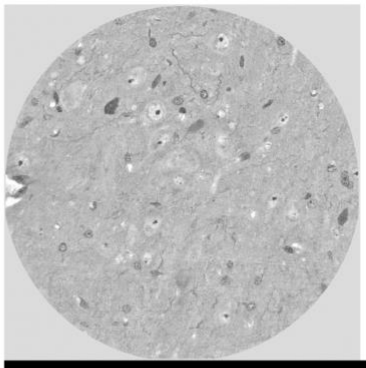
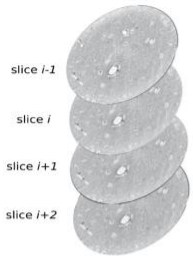
2. European Synchrotron Radiation Facility, Grenoble, France
3. Ludwig-Maximillian University, Munich, Germany

Report:

The intermingled neural synapses and the surrounding glio-vascular architectures represent a basic electrochemical and metabolic module (also called tripartite synapse) at the cortical level in the brain. Indeed, the synaptic electrical activity, recorded as local field potentials, depends from optimal glial-vascular compartment dynamics, where glial cells are the bridging structures allowing for the transfer of metabolites and oxygen from microvessels to neurons. In this experiment we explored the possibility to unveil the intricate the structural substrate of this neuroglialvascular relationship. We acquired microtomography of cortical brain samples at the resolution of 0.8 µm and we developed an automated method to segment two important classes of the nervous tissue cells (see figure below) according to morphological features: the vascular endothelial cells and the pyramidal neurons. A manuscript containing these results is in preparation.

With the developed experimental and computational framework we will also explore the differences between normal and chronic pain primary somatosensory cortex samples. To this purpose we will plan to perform further acquisitions.

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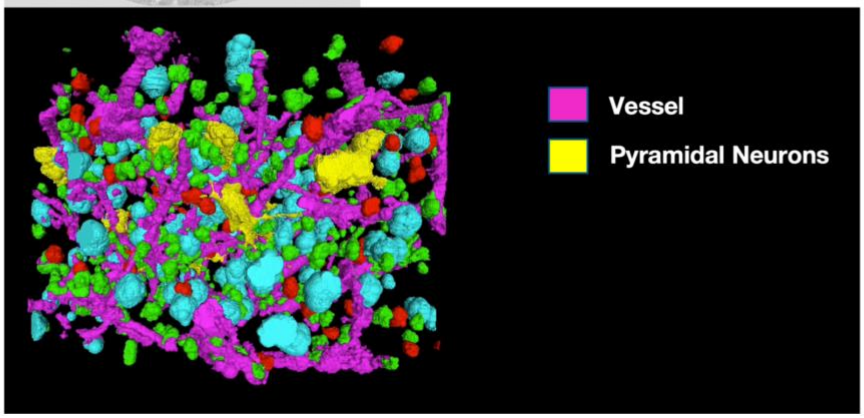
Vessel
Pyramidal Neurons