



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://www.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 from 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.



	Experiment title: Investigating Octopus arm sensory receptors	Experiment number: MD1326
Beamline: ID17	Date of experiment: from: 23 July 2023 to: 28 July 2023	Date of report:
Shifts: 9	Local contact(s): Marina ECKERMANN	<i>Received at ESRF:</i>
Names and affiliations of applicants (* indicates experimentalists): CEDOLA Alessia, CNR Nanotec - Piazzale Aldo Moro 7 IT - 00185 ROMA PALERMO Francesca, CNR Nanotec - Piazzale Aldo Moro 7 IT - 00185 ROMA MARROCCO Nicole, CNR Nanotec - Piazzale Aldo Moro 7 IT - 00185 ROMA		

Report:

In the present experiment, we exploited X-ray phase contrast tomography to investigate the presence, structure and innervation pathway of the muscle proprioception in the octopus arm and the structure and organization of mechano and chemical receptors of the octopus arm sucker.

The samples consisted in small slabs of tissues (about 2mm x 1mm) coming from the octopus arm suckers. We distinguished the regions: normal sucker acetabulum, extra sucker acetabulum, normal sucker infundibulum, normal sucker infundibulum. The samples were included in paraffin and for the imaging were cut with a 1mm-biopuncher.

The tomography was produced by means of 2000 projections for 4 distances, with an effective pixel size of 100nm or 80 nm, depending on the samples. The acquisition time for each angular position was 200 ms.

We also carried out 1-distance acquisitions with 4000 projections to test the resulting image quality with a faster scanning procedure.

Data preprocessing, phase retrieval and tomographic reconstruction were performed in situ by using ID16a softwares.

By comparing the sucker receptors at infundibulum and acetabulum level we have been able to identify the morphological features typical of these structures. We are still working on the interpretation of the data with our collaborators of University of Genoa that are correlating our findings with their SEM and TEM investigations. However, the results of the experiment appear very good and promising.

There was a beamdump during the first day of the beamtime. Between day 2 and day 3 of the beamtime we had one day of Machine Dedicated Time.