

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>

Reports supporting requests for additional beam time

Reports can be submitted independently of new proposals – it is necessary simply to indicate the number of the report(s) supporting a new proposal on the proposal form.

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.

Deadlines for submission of Experimental Reports

- 1st March for experiments carried out up until June of the previous year;
- 1st September for experiments carried out up until January of the same year.

Instructions for preparing your Report

- fill in a separate form for each project or series of measurements.
- type your report, in English.
- include the reference number of the proposal 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: The effect of silver nanowire diameter on genotoxicity to human fibroblast cells	Experiment number: LS-2549
Beamline: ID16A	Date of experiment: from: 15 February 2017 to: 20 February 2017	Date of report: 26 February 2017
Shifts: 9	Local contact(s): Hiram Castillo-Michel and Ana Elena Pradas	<i>Received at ESRF:</i>
Names and affiliations of applicants (* indicates experimentalists): Sylvia Lehmann*, University of Grenoble–Alpes Laurent Charlet*, University of Grenoble–Alpes Ana Elena Prada*, ESRF and University of Grenoble–Alpes Sylvain Bohic, ESRF Benjamin Gilbert*, Lawrence Berkeley National Laboratory		

Report: *This is a **Preliminary Report** because data analysis is ongoing.
This is a **Confidential Report** because none of the data are published.*

We accomplished all of the goals described in our beamtime proposal. The results described below are exciting new observations of nanowire toxicity. In combination with associated beamtime on ID16A, and with numerous complementary laboratory studies of cytotoxicity and genotoxicity, we anticipate this work will generate a very good publication that we have begun to work towards.

Experimental Approach

We studied mouse fibroblast cells grown on a silicon nitride membrane and exposed to a low dose of silver nanowires (Ag NWs) for 24 hours. We studied Ag NW of similar mean length (9 μm) and two diameters (30 nm and 90 nm) to test for differences in internalization and fate. The cells were washed, rapidly frozen and studied under cryogenic conditions. We identified cells containing NW by fluorescence mapping and then acquired silver XANES to identify chemical changes to the NW and to investigate silver released into the cytoplasm. **Figure 1** illustrates the analysis on one sample in which we identified and selected an internalized silver nanowire for chemical analysis.

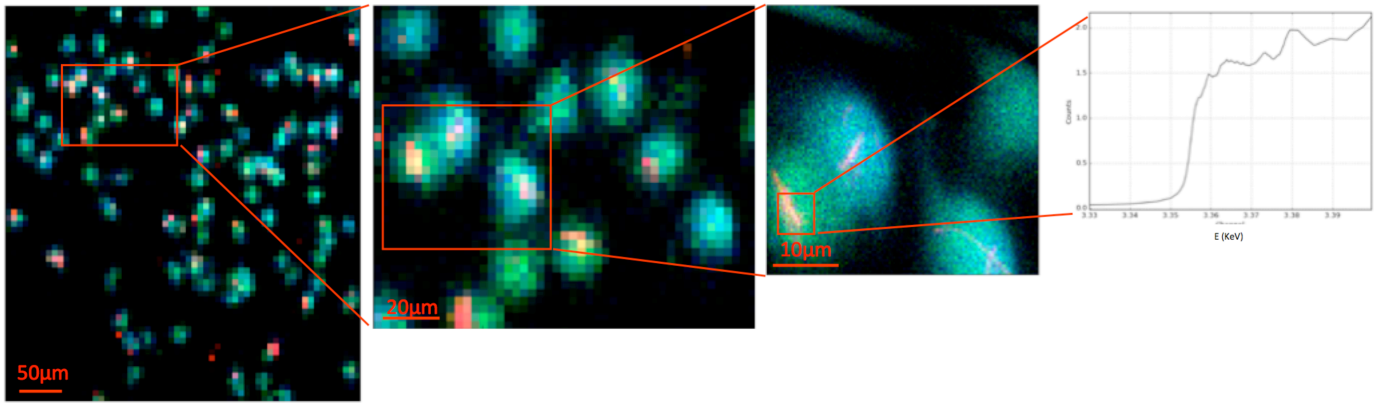


Figure 1 Example of the data acquisition strategy. We performed elemental mapping of multiple cells and studied the chemistry of internalized nanowires.

Major Findings

We observed a substantial chemical change to internalized silver nanowires that was consistent with sulfidization reactions that occurs within the cells.