

Project name: Investigation of Tc-99 in Gold-Albumin Nanoclusters (INDU-13-K13)

Beamtime Report

dd.mm.yyyy - dd.mm.yyyy (Date of the report to be added)

General information

Name of the rapporteur	Name of the rapporteur's organisation
Marius Stalnionis	Agency ASAi Antakalnio g. 38-12 LT-10305 Vilnius
Type of research (nanotechnology/health care/chemistry etc.)	Name of the research facility
nanotechnology/healthcare	Beamline P06, HASYLAB
Date of the measurement, duration	Location of the event
25.11.2013 - 26.11.2013	DESY Deutsches Elektronen-Synchrotron Notkestraße 85 22607 Hamburg Tel. +49 (0)40-8998-0
Facility personnel participating in the measurement	
Michael Murphy, Graham Appleby	

Description of the project

Research description (short summary as written in the application)
<p>The study is addressed towards methods of early detection of cancer. Combination of the imaging modalities gives the advantage of providing extra pathological and anatomical information to the clinicians. In this study we are designing a dual imaging contrast agent composed of fluorescent Gold-Albumin nanoclusters labeled with radioactive medical isotope Technetium-99m. One of the major problems of such modification is the chemical analysis of the final compound. The difficulty arises due to the fact that the molar amount of the produced complex is of a scale of $\sim 10^{-9}$ M. Neither our UV-Vis Spectroscopic or Fluorimetric, nor Thin Layer Radio-Chromatographic equipment is sensitive or specific enough to meet our needs. Our results so far showed that the designed compound has the potential for the abovementioned application. But more in depth investigation of the fluorescent/radioactive complex is required.</p>
Summary of activities (experiments performed, beamtime used, preliminary overview of results, next steps and other relevant information)
<p>x-ray fluorescence beamline P06 at DESY for XANES measurements of the gold/albumin nanoparticle samples; 24 hour of beamtime on 25th Nov 2013; Small angle x-ray scattering (SAXS) measurements in January 2014; Expert analysis and report of the measurements; Apparently the XANES measurements were considered unsuccessful. Unfortunately, the concentration of the samples was too low to be detected with the</p>

XANES method even though the largest concentration possible was prepared. Primarily results from SAXS measurements are still pending. We have to wait for the final results to consider what should be done next.

How would you describe cooperation and assistance from industrial liaison officers and national contact points while preparing and carrying out the research at large scale facilities?

Everything was very very well organized from all the parties involved in the project. Especially Dr Appleby's contribution is worth a mention. From the beginning Dr Appleby negotiated a dialog and kept constantly informing, consulting, reminding and helping to organize the workflow and work-up for the experiments at DESY. Lithuanian MITA personnel were also very helpful and well organized. Thanks to MITA I learned about Science Link and they helped me with the submission of the application and kept on track during the preparation for the research. They organized the delivery of the samples to the facilities.

Other personal remarks

Dr Appleby and I exchanged over 20 emails and even met in person once, so that's an example of a good communication in my personal standards. I enjoyed having worked for the same project with Dr Appleby.

Annexes

Annexes

(list of annexes; meeting minutes, graphical illustrations, tables and other supplementary data)