University of Pittsburgh -- NSF Data Management Plan – Example 1

Data Management

Main research results will be shared with the academic community and general public through the world wide web. The emphasis of data management will be on faithful and reproducible record keeping, with an emphasis on transparency and accountability in methods utilized.

Products of Research

The main contributions of this research project are the development of manufacturing processes, modeling of these manufacturing processes, and characterization of samples associated with these manufacturing processes. Details of the main research products will therefore appear in text, tables, plots, and images in peer-reviewed journal articles and/or conference proceedings. The results may also be included in book chapters. Patents will be sought when relevant.

Data Format and Content

All researchers are required to maintain laboratory notebooks. The laboratory notebook documents the design of experiments, development of manufacturing processes, and results of the research. It contains drawings, calculations, text, plots, and images. Laboratory notebooks are legible and reasonably organized. Many ideas may be mentioned and the reasons for choices amongst alternatives are articulated. Each laboratory notebook entry is marked with the date, and sufficiently detailed and clear such that other researchers may look at the entry at any later date and be able to reproduce what was performed. These records will be durable, accessible, and made safe from tampering or falsification. The PI will emphasize to all researchers on the project, "if you didn't document it, you didn't do it."

Results of the research will be made available in digital form in spreadsheet tables, tab-delimited files, or image files. Images will be saved in standard image formats such as JPEG, TIFF, or PNG. Main research products will be available online in digital form. Manuscripts will appear in PDF, and contain text, calculations, drawings, plots, and images. The targeted journals for the results of this research project, Nature Nanotechnology, Science, Nano Letters, Applied Physics Letters, etc. all provide a downloadable PDF copy of the manuscript on the web. In addition, the PI will link to these journal publications from his group website's "Publications" section.

Data Access and Sharing

All participants in the project will publish the results of their work. Papers will primarily be published in peer-reviewed journals and/or conference proceedings. The results may also appear in books written in English. Primary data and other supporting materials created or gathered in the course of the work will be shared with other researchers upon reasonable request and within a reasonable time of the request.

Reuse and Redistribution

Public access to research products will be regulated by the University of Pittsburgh in order to protect privacy and confidentiality concerns, as well to respect any proprietary or intellectual property rights. Legal offices will be consulted on a case-by-case basis to address any concerns, if necessary. Terms of use will include proper attribution to the PI and authors along with disclaimers of

liability in connection with any use or distribution of the research data.

Archiving and Preservation of Access

Research products will be made available immediately after publication. Journal publications will be available online from respective journal websites and linked to by the PI's University of Pittsburgh group website. All data generated as a result of this project will backed up daily to protect from loss of data from hardware failures, fire, theft, etc.

University of Pittsburgh -- NSF Data Management Plan – Example 2

Data Management Plan

The proposed research activities will generate experimental data. Publication of important results and of supporting data has been a high priority for both PIs on this proposal. They maintain websites that list recent publications and contain links to the sources for the articles. The PIs are committed to prompt and full publication of important results and of all important data that will result from the proposed work. Specific details of our data management plan are listed below:

1. All researchers involved in the proposed activity will keep detailed experimental laboratory books. These are bound books with sequentially marked pages, where any experiment will be documented in detail (including step-by-step procedures, materials and equipment used, methodology, statistical treatments, and conclusions). In agreement with governmental regulations, the University of Pittsburgh requires retention of these laboratory books for a minimum of seven years after final reporting or publication of a project.
2. All papers will be published promptly in the open literature with full credit to those who did the research by inclusion in authorship. Order of authorship will be determined by accepted standard practices of listing those who performed most of the work being listed before those who played a less prominent role. Both PIs in this project have a robust tradition of promptly publishing results in high-impact journals.
3. Links to all papers generated will be made available on the PIs' research websites.
4. We do not expect to generate data or information which would be considered privileged or confidential in the course of the proposed project.
5. Any experimental techniques/designs developed within the scope of the proposed work will be fully shared with other investigators.
6. All raw data in electronic form will be stored in an organized fashion with the possibility of retrieval using laboratory notebooks and indices as a guide. Widely used and accessible formats will be employed.
7. Supplemental Information sections of journal articles will be used extensively to disseminate experimental details.
8. All stored electronic data, updated frequently, will be continuously backed up to external (including cloud-based) media.
9. Primary data will remain in the laboratory where it originated (i.e. at the University of Pittsburgh). Copies of intangible data created by the PIs may be taken with either PI should he leave the University for a new appointment elsewhere. Samples of tangible materials created or collected in the course of the project (such as samples of nanomaterials) may be transferred to another institution in agreement with University regulations, i.e. "if sufficient samples exist, and if the samples can be easily split at minimal cost. In all cases, the transfer shall be subject to the terms of a materials transfer agreement negotiated by the Office of Research and the recipient institution. These rights to access data also apply to trainees and students who are an integral part of the research project."

University of Pittsburgh -- NSF Data Management Plan – Example 3

Data Management Plan

I. Types of data from the Proposed Research

Data that will be managed means recorded information of scientific or technical nature, regardless of form or the media on which it may be recorded. Due to its interdisciplinary nature, the proposed research is expected to generate three different types of scientific data.

First, we will produce experimental data on the properties of insulating nanophosphors and plasmonic particles. They include material synthesis techniques based on inorganic chemistry and thin film coating process. Also, the optical, electrical, and structural properties of synthesized materials measured by various characterization tools, will be a part of experimental data that we will generate.

Second, the proposed research will provide the bimodal contrast agent that will be comprised of a magnetically active component and an optically active component. The multimodal imaging results and the contrast agent itself will be counted as data which should be properly managed during and after the proposed research.

Third, the theoretical calculation component of the proposed research will also produce a certain amount of data. Data of interest coming from the computational work will be grouped to 1) the simulation codes for analytically or numerically calculating the surface plasmons and 2) the calculation results showing a predicted correlation between the shape factors and the surface plasmons.

II. Data Recording and Retention

The retention of accurately recorded and retrievable research data is of utmost importance for the progress of scientific integrity. PI and participating graduate students will have responsibility for recording, retaining, and storing research data. The records will include sufficient detail to permit examination for the purpose of replicating the research, responding to questions that may result from unintentional effort or misinterpretation, establishing authenticity of the records and confirming the validity of the conclusions.

Since different types of data will be generated in the process of the proposed research, we will use different data standards to manage our data, which will follow “University of Pittsburgh Guidelines on Research Data Management”.

Regarding the experimental data on the material properties and device performance, we will use both hard copy of experimental notebooks and computer softwares. PI and graduate students will document detailed procedures of experiments in the experimental notebooks and maintain their hard copies. Study title, study hypothesis, detailed information on the equipment and materials used, sources of the materials, experimental methodology, statistical treatments, results and conclusions will be available in the experimental notebook in order to enable replication of the experiments. After the proposed research ends, bound notebooks with consecutively numbered pages will be kept in PI’s laboratory. Whenever possible, raw data will be added to the experimental notebook. In the event that electronic storage is possible, raw data obtained from various experimental measurements of the material properties will be electronically saved as ascii files. Also, their plot and analysis results will be saved by commercial software, Origin (version 8.1). Since PI recently purchased two latest copies of Origin through the academic agreement between Swanson School of Engineering and OriginLab, his research group will use this software for the management of the data in addition to the data analysis and graphing.

The specimen and electroluminence device samples which are not easily attached to the notebook will be stored separately in PI's laboratory with explicit instructions as to where they can be found.

In addition, raw files associated with the computer simulation research will be electronically stored. Electronic records will contain the information on the data generation and modification that will allow tracking subsequent changes.

III. Policies for Data Access, Sharing and Preservation

Both the PI and the University of Pittsburgh will have responsibilities, and hence rights, concerning access to, use of, and maintenance of original research data. Consistent with the precepts of academic freedom and intellectual integrity, investigators not part of PI's laboratory may be allowed to retain copies of the research records and portions of materials created in the proposed research. Copies of intangible data such as findings, statistics, and conclusions produced by the proposed research may be provided to other investigators in University of Pittsburgh and outside institutes. Samples including prototype electroluminescence devices collected from the proposed research may be transferred to another laboratory if sufficient samples exist at minimal cost. In all cases, the transfer of data and samples shall be subject to the terms of agreement negotiated by the Office of Research at the University of Pittsburgh. Extramural sponsors providing support for research may also have the right to reviews the data and records resulting from that extramural support.

Published primary research data and unique materials collected or created in the process of the proposed research will be shared on request by other researchers in accordance with the general spirit of colleagueship within the scientific community and with policies adopted by the University of Pittsburgh and funding federal agencies. When the data will be used for a patent application filed by the University of Pittsburgh, the original data including tangible samples will be kept within the University.

In accordance with the guidelines of the University of Pittsburgh, research records will be archived for a minimum of seven years after final reporting or publication of a project. Whenever possible, the archived records will be originals. If any questions regarding the research, including but not limited to research integrity allegations, are raised during the seven-year retention period, the PI will keep the records until such questions are fully resolved.