**National Science Foundation**

**NSF-CHE: Chemistry Division**

**[**Replace Header with ‘Data Management Plan’ prior to submission]

**Products of research**

[Enter content here, then remove the Guidance prior to submission]

**Guidance:**

Describe the types of data and products that will be generated in the research, for example numerical data on chemical systems such as spectra, diffraction patterns, physical properties, time-dependent information on chemical and physical processes, theoretical formalisms, computational strategies, final or intermediate numerical results from theoretical calculations, software, and curriculum materials.

Describe what data or other research products you will generate in the course of your project. Include the size or amount of data produced, the type of data files that will be generated, and where and when the data will be produced. Examples of research products include observational data, results from models, data generated from previous observations or models, physical samples, software, curriculum materials, etc. Consider the following:

* What data will be generated in the research?
* What data types will you be creating or capturing? (e.g. experimental measures, observational or qualitative, model simulation, processed etc.)
* How will you capture or create the data?
* If you will be using existing data, state that fact and include where you got it.
* What is the relationship between the data you are collecting and the existing data?
* How much data will be produced?

**Data format**

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**Guidance:**

Describe the format in which the data or products are stored (e.g., hardcopy notebook and/or instrument outputs, ASCII, html, jpeg or other formats). Where data are stored in unusual or not generally accessible formats, explain how the data may be converted to a more accessible format or otherwise made available to interested parties. You may also comment on the current or anticipated need for interested parties outside of your laboratory to access your primary data.

Describe the format of your data, and think about what details (metadata) someone else would need to be able to use these files. Metadata may entail descriptions of research details such as: experiments, apparatuses, computational codes, etc. Consider these questions:

* Which file formats will you use for your data, and why?
* What form will the metadata describing/documenting your data take?
* How will you create or capture these details?
* Which metadata standards will you use and why have you chosen them? (e.g. accepted domain-local standards, widespread usage).
* What contextual details (metadata) are needed to make the data you capture or collect meaningful?

**Access to data and data sharing practices and policies**

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**Guidance:**

"Access to data" refers to data made accessible without explicit request from the interested party, for example those posted on a website or made available to a public database. Describe your plans, if any, for providing such general access to data, including websites maintained by your research group, and direct contributions to public databases (e.g., the Protein Data Bank, Cambridge Crystallographic Data Centre, Inorganic Crystal Structure Database in Karlsruhe, Zeolite Structure Database). Also note if you submit your data in the form of tables, graphs, computer code or other format to the supplementary materials sections of peer-reviewed journals. Describe your practice or policies regarding the release of data for access, for example whether data are posted before or after formal publication. Finally, note as well any anticipated inclusion of your data into databases that mine the published literature (e.g., PubChem, NIST Chemistry WebBook). "Data sharing" refers to the release of data in response to a specific request from an interested party. Describe your policies for data sharing, including where applicable provisions for protection of privacy, confidentiality, intellectual property, national security, or other rights or requirements.

Describe how you will make the data available to other researchers, as well as to the general public. Consider what data will be available (and in what formats) and where (on your website, available via ftp download, via e-mail, or another way). Please keep in mind that you are expected to adequately provide responses for both how you plan on making your data accessible without a specific request from a researcher, and how you will be able to provide data to the public. Make sure to mention how long the data will be kept private before making it available, and if different data products will be available on different schedules (e.g. raw data vs. processed data). Use this section to also explain policies for the protection of proprietary data, issues of privacy and confidentiality, and intellectual property as their impact on the dissemination of your data. Consider these questions:

* How and when will you make the data available?
* What are your plans for providing access to your data? (on your website, available via ftp download, via e-mail, or another way)
* What file formats will be used for data sharing?
* How long will the original data collector/creator/principal investigator retain the right to use the data before opening it up to wider use?
* How long do you expect to keep the data private before making it available? Explain if different data products will become available on different schedules (Ex: raw data vs processed data, observations vs models, etc.)
* Are there ethical and privacy issues? If so, how will these be resolved?
* Who will hold the intellectual property rights to the data and how might this affect data access?
* If applicable, what have you done to comply with your obligations in your IRB Protocol?
* How long will/should data be kept beyond the life of the project?

**Policies and provision for re-use, re-distribution and products of derivatives**

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**Guidance:**

Describe your policies regarding the use of data provided via general access or sharing. For example, if you plan to provide data and images on your website, will the website contain disclaimers, or conditions regarding the use of the data in other publications or products? Describe these disclaimers and/or terms of use.

Explain how the policies outlined in the previous question can be applied to the re-use and re-distribution of your data. Identify who will be allowed to use your data, how they will be allowed to use your data and whether or not they will be allowed to disseminate your data. If you are planning on restricting access, use or dissemination of the data, you must explain in this section how you will codify and communicate these restrictions. Consider the following:

* Will any permission restrictions need to be placed on the data?
* Who is likely to be interested in the data?
* What and who are the intended or foreseeable uses the data?

**Archiving of data**

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**Guidance:**

Describe how data will be archived and how preservation of access will be handled. For example, will hardcopy notebooks, instrument outputs, and physical samples be stored in a location where there are safeguards against fire or water damage? Is there a plan to transfer digitized information to new storage media or devices as technological standards or practices change? Will there be an easily accessible index that documents where all archived data are stored and how they can be accessed?

Provide a description of your long-term strategy for archiving and preserving the data you plan to generate/use. Consider the following:

* What is the long-term strategy for maintaining, curating and archiving the data?
* Which archive/repository/database have you identified as a place to deposit data?
* What procedures does your intended long-term data storage facility have in place for preservation and backup?
* How long will/should data be kept beyond the life of the project?
* What data will be preserved for the long-term?
* What transformations will be necessary to prepare data for preservation / data sharing?
* What metadata/ documentation will be submitted alongside the data or created on deposit/ transformation in order to make the data reusable?
* What related information will be deposited?