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Deciphering and engineering an unprecedented fungal biosynthetic pathway for expanded chemical diversity in flavonoids

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Data Management Plan

This project aims to elucidate fungi's strategy to assemble flavonoids and create the chemical diversity in flavonoids by rationally engineering the chlorflavonin biosynthetic pathway. The fundamental knowledge to be gained from this project will significantly advance our understanding of fungal secondary metabolic pathways and the general field of natural product biosynthesis. The PI believes that sharing of the research data is important to advance scientific research. Research results from this project will be made available to the public. Our detailed data management plan is given below:

1. Products of the Research

The data produced in the PI's lab are numerical (such as quantification of product formation and NMR data) or digital representations from chromatograms, structures, or gels. All the extracts, chemical samples and compounds will be stored in -20°C freezers. Other products including plasmids, enzymes and microbial strains will be stored in -80°C freezers.

2. Data Format

All the experimental details will be documented by the participating students in hardcopy laboratory notebooks, which will be reviewed and signed by the PI weekly and kept in the PI's lab. All electronic data such as HPLC traces, NMR spectra, DNA sequencing data, plasmid maps and project reports will be stored on computer systems with weekly back-up to a departmental server. These data will also be manually backed up monthly to external hard drives. These backup data will be stored in the PI's office.

3. Access to Data and Data Sharing Practices and Policies

New gene and amino acid sequence information related to this research will be deposited in GenBank, thus allowing other researchers to access these data. Research findings will be published in primary scientific journals such as *Nature Chemical Biology* and *Metabolic Engineering* so that peers and all other interested parties can access our most recent results. In addition, all supplemental information for the articles, including additional graphs, tables and information from output files, will be uploaded to the journal publisher's supplementary materials section of the website and made available free of charge to the public via the internet. Data sharing will be adhered to by releasing data in response to a specific request from an interested party. Links to published work are made available on the PI's lab webpage (metabolicengineering.usu.edu), with no disclaimers or terms of use, as these are determined by the journal where the data is published. While many journals require subscription to gain access, Ph.D. dissertations by the participating students will be published at DigitalCommons@USU (<http://digitalcommons.usu.edu/>) through the USU library, which is accessible to the public without any restrictions or charges. If the publishers allow, we will also post the accepted version of our manuscripts at DigitalCommons@USU. The PI and students will present their research results at professional conferences such as the American Chemical Society, Institute of Biological Engineering, and American Institute of Chemical Engineers national meetings.

Research resources that are generated from this project, such as plasmids, compounds and engineered strains, will be made available to all researchers in both the private and public sectors free of charge or for a nominal charge, and with minimal restrictions. Upon request, resources will be distributed in a timely manner. When needed, the Intellectual Property Services Office at USU will be involved in generating license agreements, material transfer agreements, and

confidentiality agreements related to intellectual property and confidentiality of the corresponding resources.

4. Policies for Re-Use, Re-Distribution and Production of Derivatives

The PI and USU will hold the copyright of all data and images generated by the proposed project. By depositing data on the website, the PI does not transfer copyright but instead grants permission for the public to disseminate the data and to facilitate preservation. Disclaimers will be given on the website alerting the user to conditions regarding the use of the data in publications and products. As a general rule, users of the data or images will be required to cite the published article containing the original data in their work.

5. Archiving of Data

All data generated in the PI's lab are stored for at least three years beyond the end of the project funding period. To protect against water and fire damage, hardcopy notebooks with consecutively numbered pages and printouts of spectra or instrument outputs are stored on elevated shelving in a room with fire-stop doors. Electronic data storage devices include instruments' internal memory and external hard drives. As a regular practice, stored data is/will be periodically transferred to a new storage medium to ensure the compatibility with emerging technologies.