Plan Overview

A Data Management Plan created using DMPonline

Title: NWO Vici Seeds4Ever: Protection of stored mRNAs to ensure seed survival

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Project abstract:

Seeds are a major staple food and the commodity for crop production. Seed storage is essential for the conservation of biodiversity and crop production. To grow into crops seeds need to germinate and for this the translation of seed stored messenger (m) RNAs is absolutely required. Seed stored mRNAs can survive for many years, which is surprising considering their short half-life times in metabolically active cells. Lack of knowledge on how seed mRNAs are protected is a major limitation to understanding what makes seeds long-lived. The aim of Seeds4Ever is to elucidate how seed stored mRNAs are protected. mRNAs in dry seeds are associated with ribosomes and my group recently discovered that these mRNA ribosome complexes are associated with stress granule proteins. Stress granules are cytoplasmic foci that contain all the factors required for translation, but translation is on hold. I hypothesise that seed stored mRNAs are protected in stress granules. To test this hypothesis I will explore the cellular localisation of seed stored mRNAs (in dry seeds and in wet seeds of the soil seed bank; WP1 and WP2) and functionally analyse the role of stress granules in mRNA protection and seed longevity (WP3). I will determine at which position ribosomes bind the seed stored mRNAs and investigate the mechanisms of mRNA selection for storage (WP4). Moreover, the seed industry suffers economic losses due to the often short shelf-life of primed seeds (pre-germination required to ensure germination). Seeds4Ever will provide markers that will help to improve seed treatments so that longevity is no longer shortened (WP5). Seeds4Ever will bring seed longevity research from the physiological to the cellular and molecular level. Findings of Seeds4Ever will be of great fundamental interest but also valuable for conservation of biodiversity in gene banks and ecological settings, and for the seed industry.

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NWO Vici Seeds4Ever: Protection of stored mRNAs to ensure seed survival

General information

Name applicant and project number

Dr. ing. L. Bentsink
17047

Have you received support from the datamanagement support office of your institution writing this plan?

- No

Description of the data

Describe the data that will be collected/generated within the project.

The generated data will consist of:

- Confocal images
- RNAseq data
- Phenotypic data (mainly germination percentages, calculated based on images and an excel script)

Specify the type and format of the data.

All data will be stored will be digital. In all the case the non-processed data will be stored

Data storage during the project

What is the volume of the data and where will the data be stored?

The laboratory of Plant Physiology provides short-term storage facilities. These include personal network drives that are regularly backed-up and, if more storage space is required, a central server with secured access will be provided. Additionally external hard-drives for short-term storage of very

big datasets (RNAseq data) are available.
Generated raw RNAseq data will be deposited at SRA (Sequence Read Archive).

Is there sufficient storage capacity during the project?

- Yes

Will the data be backed-up regularly during the project? Who is responsible for this?

- Yes

Updating of the data will be performed outmatically and is in hands of the ICT department of Wageningen University and Research.

What are the expected costs? Please specify and state an amount that is as realistic as possible. How will these costs be covered?

The costs of the data management on the personal network drives is part of the accountcosts per employee. These are covered by the department. Additional hard-drives can be ordered from the material costs of the project, when required.

Archiving of data after the project

Specify in which trusted repository the data will be stored after the project.
If the data will not be stored in a trusted repository specify where it will be stored and how its made discoverable?

I aim to have full and free accessibility of all generated data. Therefore, we will publish, as much as possible, in well-established open access journals and include all raw datasets as supplementary data. As indicated above, the RNAseq datasets will be stored in SRA and released directly upon publication of the research papers describing the experiments.

Will a persistent identifier be used to make the data findable?

- Yes

Yes, if the repository provides such a PID we will use it to make our data findable

For how long will the data be archived?

The data will be archived for at least 10 years after ending the project

What are the expected costs? Please specify and state an amount that is as realistic as possible. How will the costs be covered

Network drives and data storage facilities are offered by the Laboratory of Plant Physiology. There will be no additional costs for this Vici project specifically.

Standards and Metadata

How will the data be documented? What metadata standard will be used to make the data accessible and reusable?

All the lab work will be recorded in an e-lab journal. This e-lab journal is linked to the data bases in which data will be stored. This set-up will garantee that the data will be traceble, accesible and reusable.

Making data available

Are the data available for reuse after the project?
If not, please explain why the data are not suitable and/or available for reuse.

- No

The data will be made available when published. Everything that is published will therefor be available after the project, the remaining will be made available as soon as it has been published.

If data are only made available after a certain period then please state the reason for this. If part of the data cannot be made (directly) available then please specify the part concerned.

The only reason for making the data avaliable after a certain perioed, as I can for see at this monent, will be delayed publication.

Are there any restricions/conditions for the reuse of the data?
If so, are these conditions specified in a consortium agreement?

- No