



New Arts Venture Challenge:
“COSMOS”

an art clothing line that connects scientific research,
flowers, spaceflight, and art

Kai Rasmussen

Executive Summary

Before I was a scientist, I was an artist. I began studying science at the University of Wisconsin-Madison in 2014, and when I first started it seemed that art didn't really have a place in science. That was, until I got the opportunity to perform research in the Gilroy Lab. My scientific research is the study of a family of enzymes in the model plant *arabidopsis thaliana*. I am using molecular biology techniques to apply data from an experiment our lab did with astronauts on the International Space Station in 2014 (SpaceX CRS-4). My research is funded by NASA and the NSF. This is my research abstract:

ABSTRACT

A thorough understanding of how spaceflight affects plant biology is critical to the advancement of space travel. Botany and horticulture systems will be an essential part of life support for extended space missions. The effects of microgravity, oxygen stress, cold stress, and ionizing radiation are obstacles that stand in the way of maintaining plant life. This research uses genomic data obtained from International Space Station Mission SpaceX CRS-4 to target the genes of arabidopsis manipulated by spaceflight. The peroxidase family of enzymes are genes of interest that were down-regulated during spaceflight and previous literature has shown manipulation. Peroxidase function in plant biology has been shown to play a role in response to abiotic stress as well as cell wall modeling. 4 peroxidase genes (PRX22, PRX32, PRX39 and RCI3) are identified and will be genotyped for homozygous mutants. In-silica molecular biology provides the primer design and in-silica simulation of ligation will allow these genes to be cloned for knockout, over-expression and rescue. These transgenic seeds will be subject to experimentation that mimics components of spaceflight.

Not only do I love my research, I also love doing outreach for the lab. Over the summer I taught elementary school children about spaceflight plant biology at a summer camp. I created a hip-hop song about my research (you can listen to it here: soundcloud.com/kainakano/young-mark-watney) and it was presented at the 2016 American Society for Gravitational Space Research (ASGSR) Conference, along with a cartoon I drew. I am currently working on creating images for a database of experiments for the lab as well.

The most recent piece of outreach I am working on sparked an idea. I own and co-manage the website astrobotany.com. It's intended to be an outreach tool for people to learn more about spaceflight plant biology. I co-manage it with my postdoctoral supervisor Dr. Richard Barker, and all of the artwork is created by me. As it grew more popular, several people approached me about getting shirts with astrobotany artwork on it.

This brings me to my idea and proposal for the New Arts Venture Challenge: I want to start a socially responsible fashion line called "Cosmos" that is inspired by my NASA astrobotany research. I want it to celebrate science and space and plants. I believe strongly that the first step to getting people interested in science is for them to think that it's cool. I think that

astrobotany is an inherently cool field. This wouldn't be just any ordinary clothing line: it would be a clothing line that represents an emerging field; a series of art pieces that would inspire and promote interest in science and spaceflight. I want each piece of clothing to come with a letter that explains an aspect of spaceflight and astrobotany. There is something very poetic about growing plants in space and I hope people can wear a piece that mixes art and science. I hope this can be the starting place for a potential clothing company that is socially responsible, gives back to its community, and gives money to science research. One of my dreams is to run a business like that.

Plan

I plan to create several new designs and use some of my other astrobotany designs as a starting point for the clothing line. I will need to work a screenprinting company to create the first line of shirts.

Audience Analysis

I hope the clothing line appeals to a younger audience and it may hold special significance to researchers and scientists. A number of people have expressed interest in wearing an astrobotany shirt.

Timeline

I already have several designs that would contribute well to the astrobotany "Cosmos" clothing line. I hope to perfect these and create more quickly. I want to reach out to a screenprinter and have the first shirts ready by June 2017.

Key Personnel



Kai Rasmussen
(Artist/Designer)

I am a third-year undergraduate at the University of Wisconsin-Madison studying biology. I perform molecular biology research in the Gilroy Lab and my research is funded by NASA. In addition to my research I manage the website astrobotany.com, help design biological protocol for plant research equipment, assist developing genomic bioinformatic tools and am the undergraduate ambassador for the American Society of Plant Biologists. My passion also includes international work and I am a WISc (Wisconsin International Scholar) student. I was a resident of the art studio learning community my freshman year at UW.

Financial Plan

I have a screenprinter in mind called “Ambient Inks” from my hometown in Eau Claire, WI. I hope to work with them to produce high quality clothing. I worked with them before as the treasurer of my high school band. They are local and awesome. Using their quote estimator I estimate it would cost around \$1380 to screenprint 100 shirts and may be \$200 extra to get them retail ready. I am knowledgeable in building websites and would build a brand website which would cost around \$70.

Marketing

In addition to creating a brand website, I also own the website astrobotany.com and would promote the brand appropriately there. It is ranked highly in search engine indexes and has 20-30 visitors every day. I would use word of mouth and visit the art learning community and attend plant biology events to help promote the brand. astrobotany.com already has twitter, instagram, and facebook: a strong social media presence.

Troubleshooting

I intend to make this project my highest priority if I am able to make it a reality. I am confident I can work with the screenprinter I already know (Ambient Inks), but if I am not able to make arrangements I will pursue another contract with another responsible screenprinter.