PROTEINS OF STARS : TOWARDS A SYNTHETIC TARDIGRADE

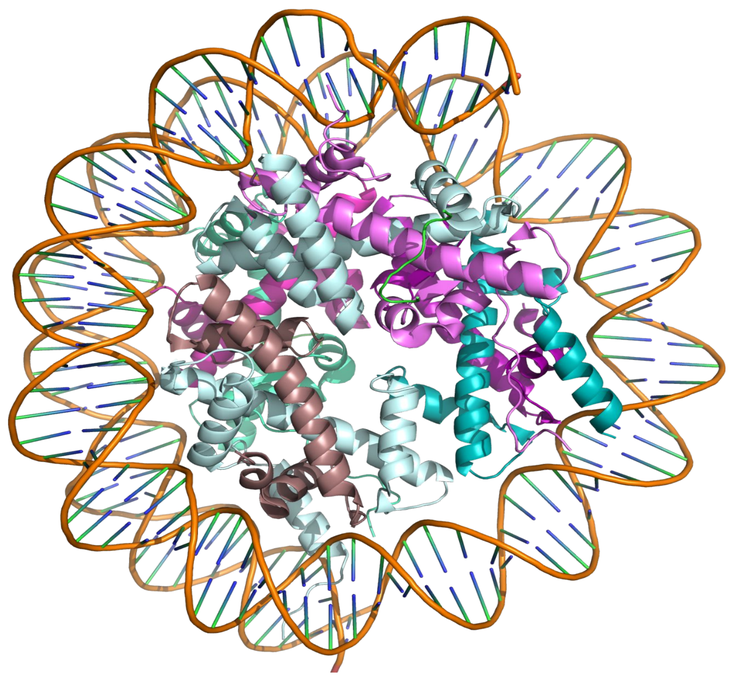
Androniki Karaniadi , department of Biochemistry and Biotechnology

introduction

Tardigrades are known for their extreme resilience . Creating synthetic organisms or incorporating tardigade traitscould protect human cells and tissues from extreme conditions of space

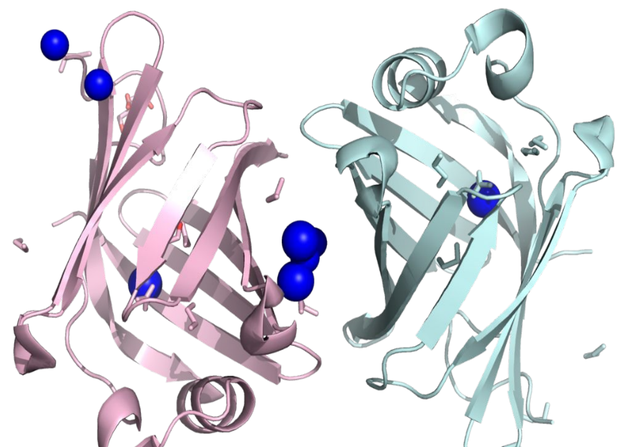
Module 1: DNA shield

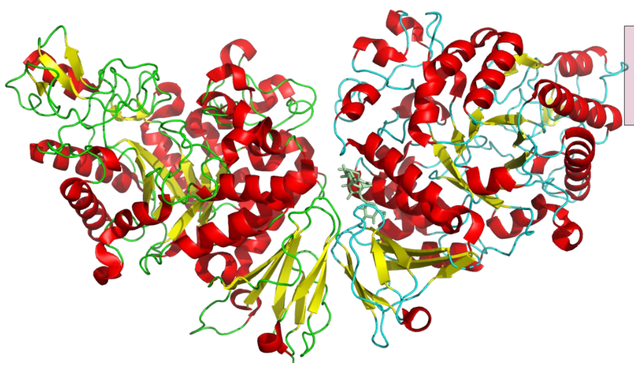
Gene : DSUP (damage suppressor protein
Goal : reduction of dna damage from radiatiom



Experiments : DSUP genetic engineering in ecoli , test in UV-C lamp , survival rate and analysis of dna damage (comet assay , PCR based

Module 2 : water and temperature shield

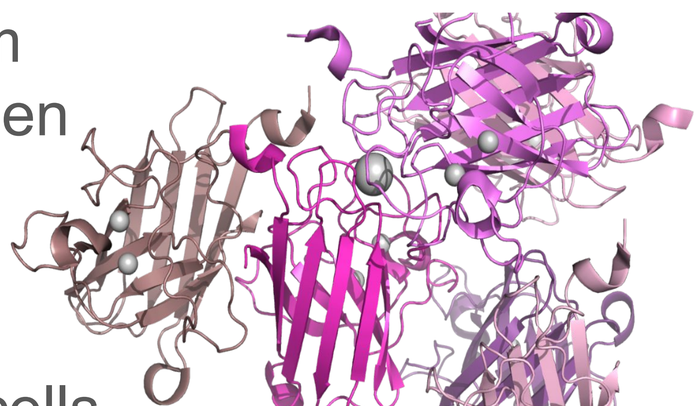




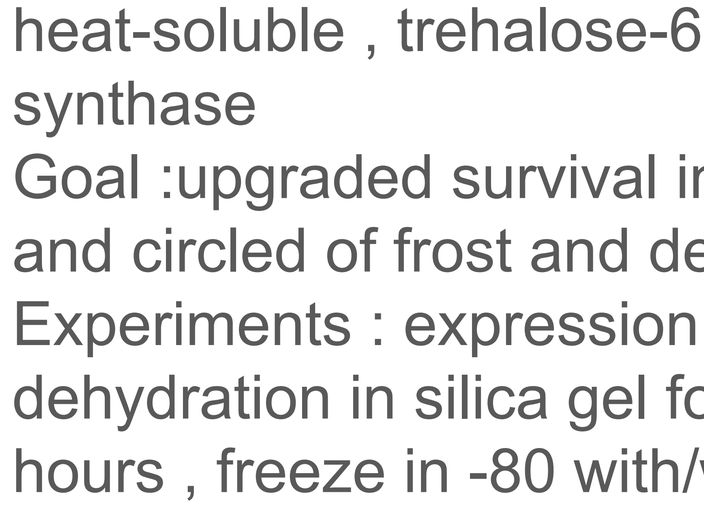
Genes : cytoplasmic abundant heat-soluble , trehalose-6-phosphate synthase
Goal :upgraded survival in drought and circled of frost and defrost
Experiments : expression in Ecoli dehydration in silica gel for 24-48 hours , freeze in -80 with/without glycerol , comparing survival rate with control group

Module 3 : ROS shield

Genes : superoxide dismutage,catalyse ,peroxideroxin
Goal : protection from ROS `(reactive oxygen species) caused by cosmic radiation
Experiments : expression in Ecoli ,cells in H2O2 and ROS environment , use of DCFDA for ROS measurement ,

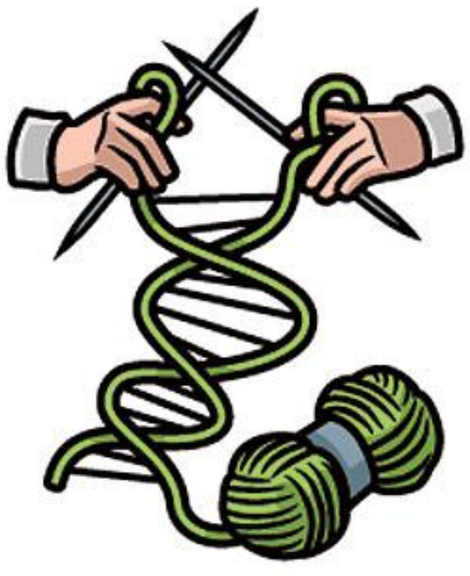


Module 4 : physical shield



Genes : ELPs (elastin like peptides),melanine and carotenoid connecting structures
Goal : connecting film surrounding the cell
Experiments: expression in sacchatomyces , microscope observation fluorescence ,survival rate in UV radiation

Final stage



Applying all modules together in synthetic system and run survival tests .