



University of
Nottingham

UK | CHINA | MALAYSIA



Astromedicine and Astropharmacy

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Astromedicine and Astropharmacy at Nottingham

Astromedicine and Astropharmacy 'the Pharmanauts'



University of Nottingham
School of Pharmacy



Astromedicine and Astropharmacy

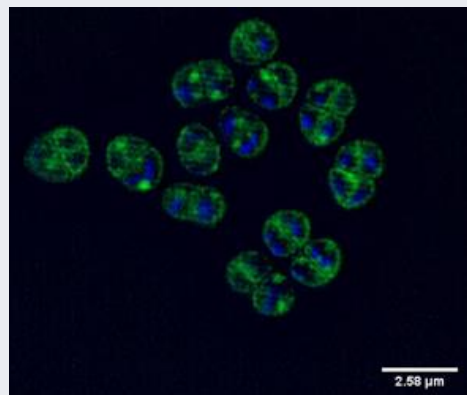
1. Can we manufacture pharmaceuticals in Space?
2. Can we protect life-saving drugs from the environmental stressors in Space?
3. Can we improve immune cell function, pharmacologically, in microgravity?
4. How does glucose uptake in astronaut's skeletal muscle differ?
5. Can we improve the nutritional value and quality of foods in Space?



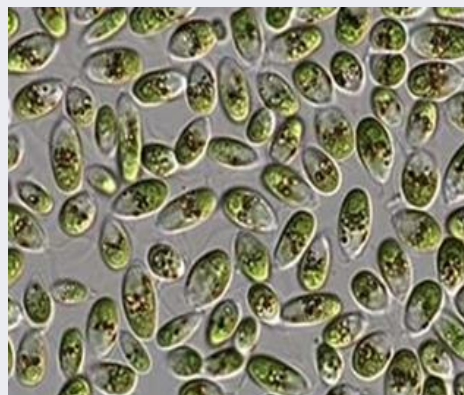
Development of a fluorescent imager and CubeSat for biological experiments in microgravity



Deinococcus radiodurans



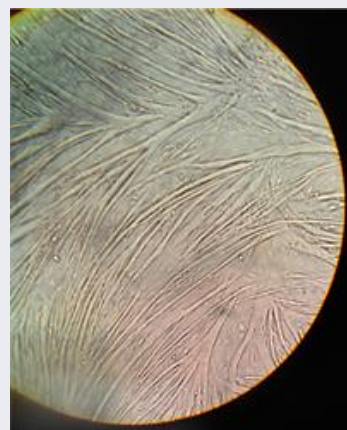
Halobacterium salinarium



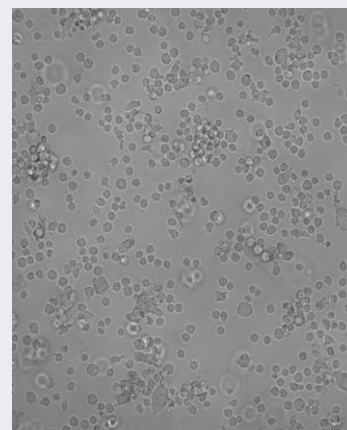
Extremophiles

- Drug manufacturing and drug delivery

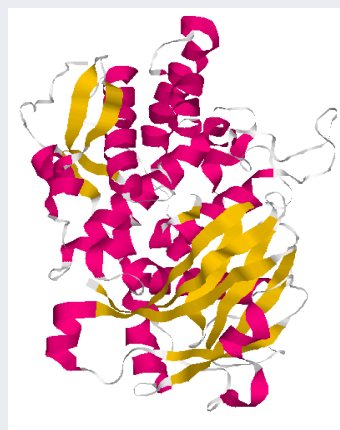
C2C12 cells



THP-1 cells



Polyphenol oxidase



Plants and Animals

- Effects of microgravity



My PhD project



Biomanufacturing in Space

NASA's BioNutrients experiment



+ H₂O

Antioxidants

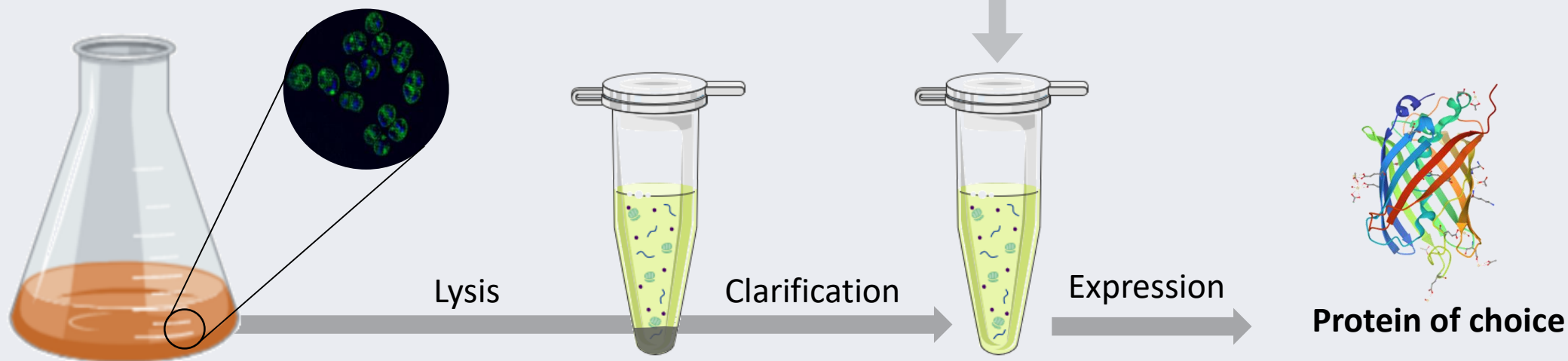
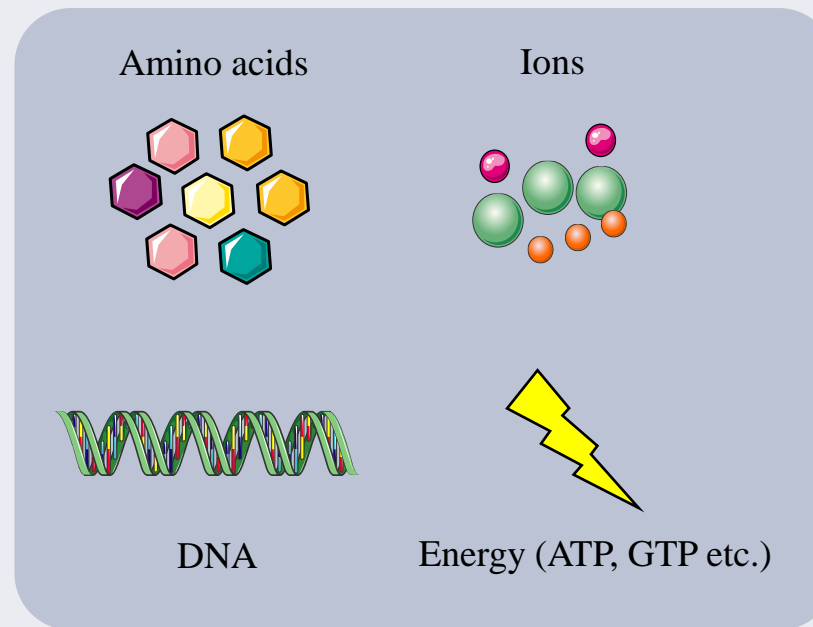
Space Synthetic Biology

On-demand biomanufacturing in Space

- Food
- Medicines
- Biomaterials

If we can manufacture in Space, we can manufacture anywhere

Cell-Free Protein Synthesis





Routes for students interested in Space Pharmacology



A bit about me

High School, India

● Internships

University of Surrey
Bachelor's in Biological Sciences

● Industrial placement at
Vertex Pharmaceuticals, Oxford



● Research project

University of Nottingham
PhD in Astromedicine and Astropharmacy

● Projects in Microgravity



Getting involved in the Space Pharmacology

Internships

- Academia
- Industry

Awareness

- Webinars
- Conferences
- Student societies

Opportunities



Access to Space for All Initiative

Space for Health

Space4Youth



Thank you!
Questions?

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