ATTENDANCE:
goo.gl/W1vmE3

UW iGEM All-Team Meeting

Feb 02, 2018

Agenda

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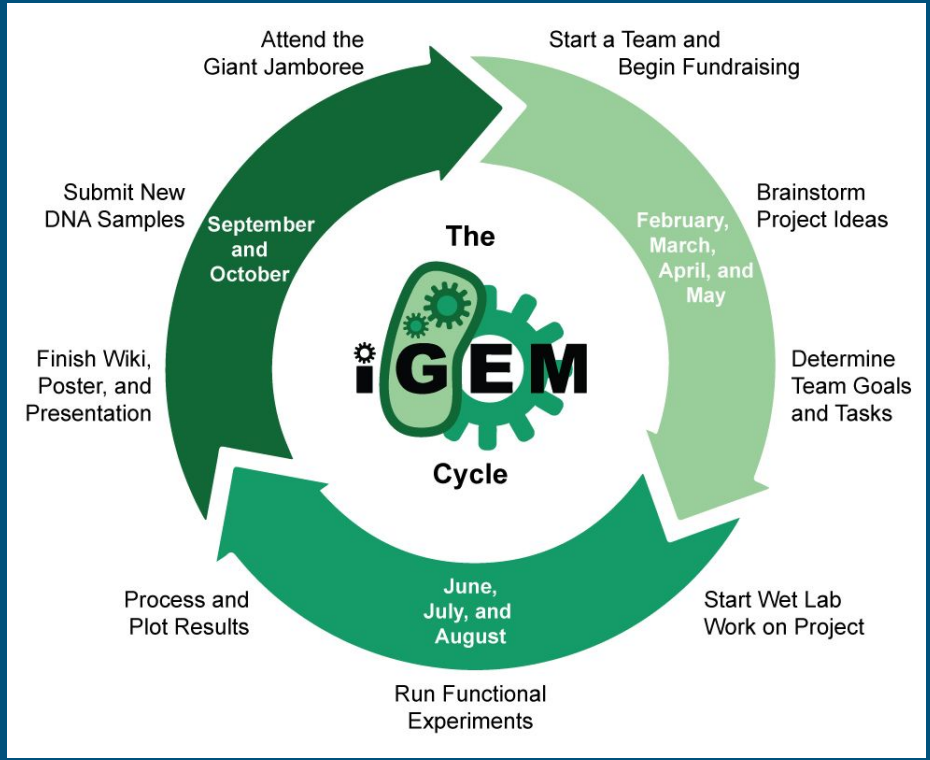
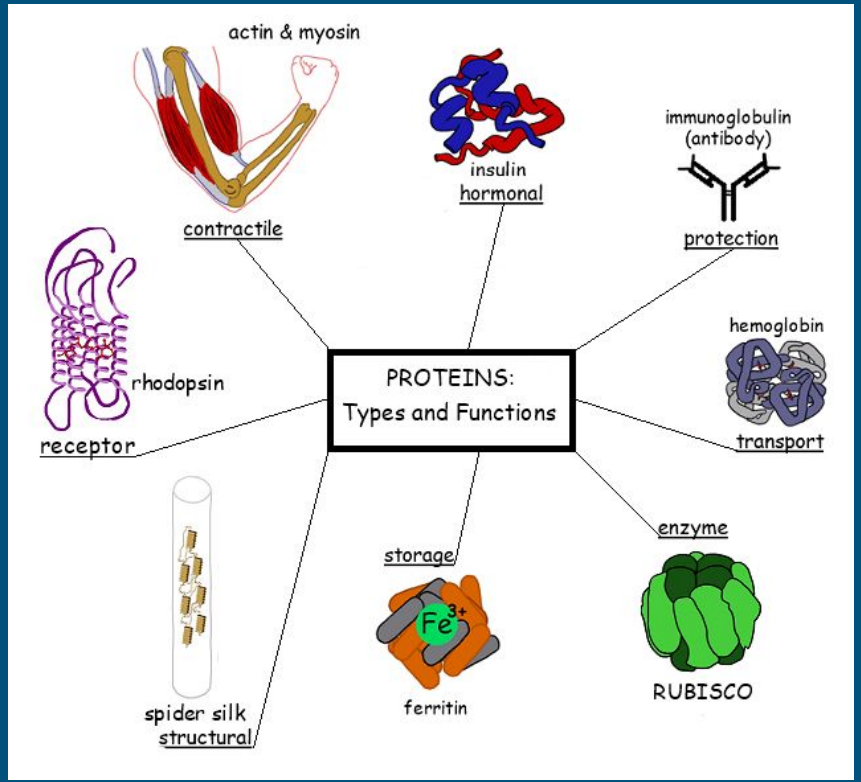
- Short intro to Molecular Biology for everyone + Q&A (15 minutes)
- Explanation of two Project ideas + Q&A (15 minutes)
- Explanation of main iGEM deliverables (20 minutes)
    - What do we need to do to get gold?
- General Q+A (10 minutes)



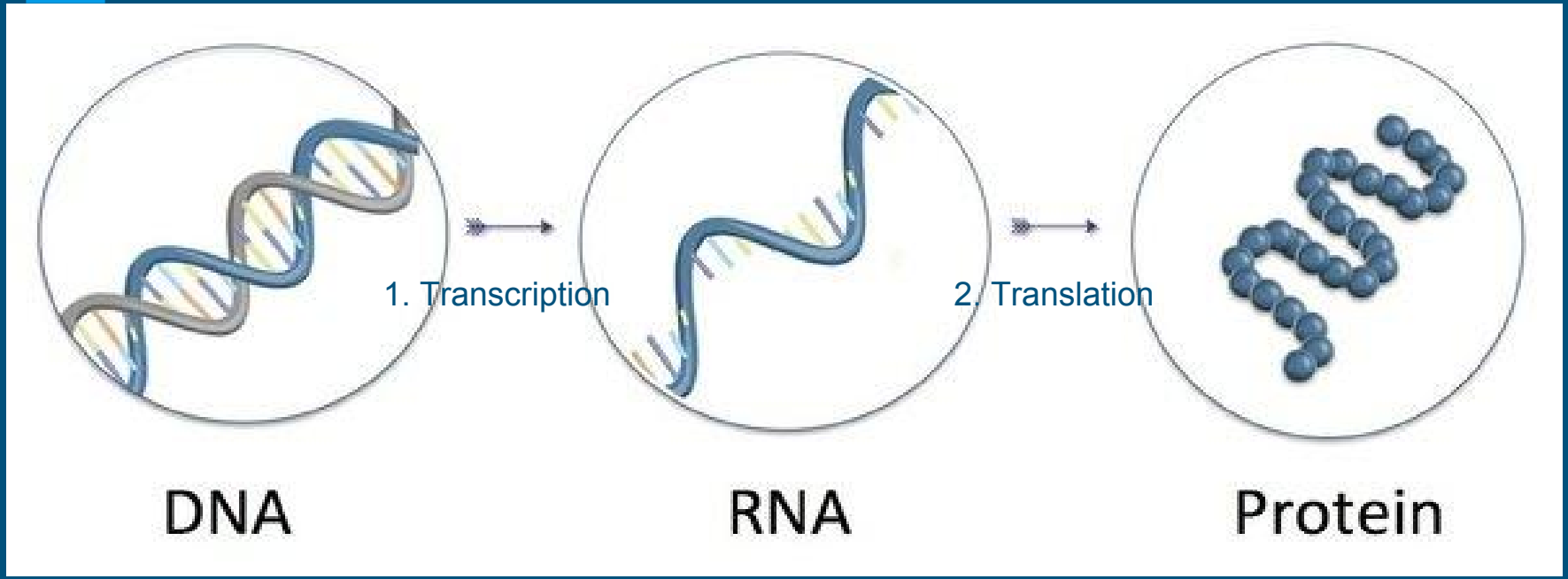
Molecular Biology

Primary Goal: Protein Synthesis

- Proteins do most things in cells
  - Signalling
  - Synthesize and modify other molecules
- Important products
  - Insulin
  - Vaccines
  - Drugs

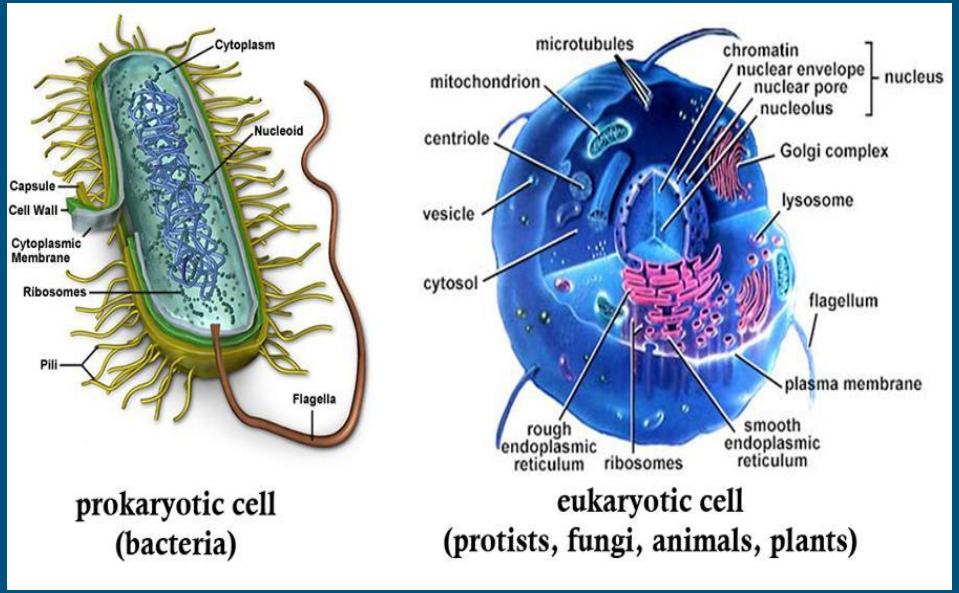


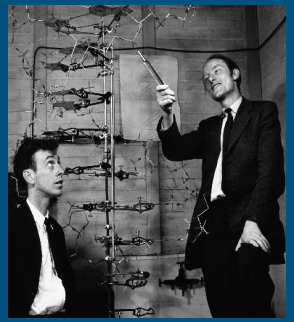
How to Make Proteins - Central Dogma

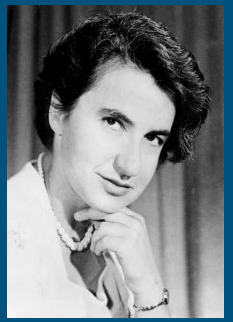


Discovery

- DNA = deoxyribonucleic acid
- Found in both prokaryotes and eukaryotes
- Molecular structure discovered by Watson and Crick, with data from Rosalind Franklin

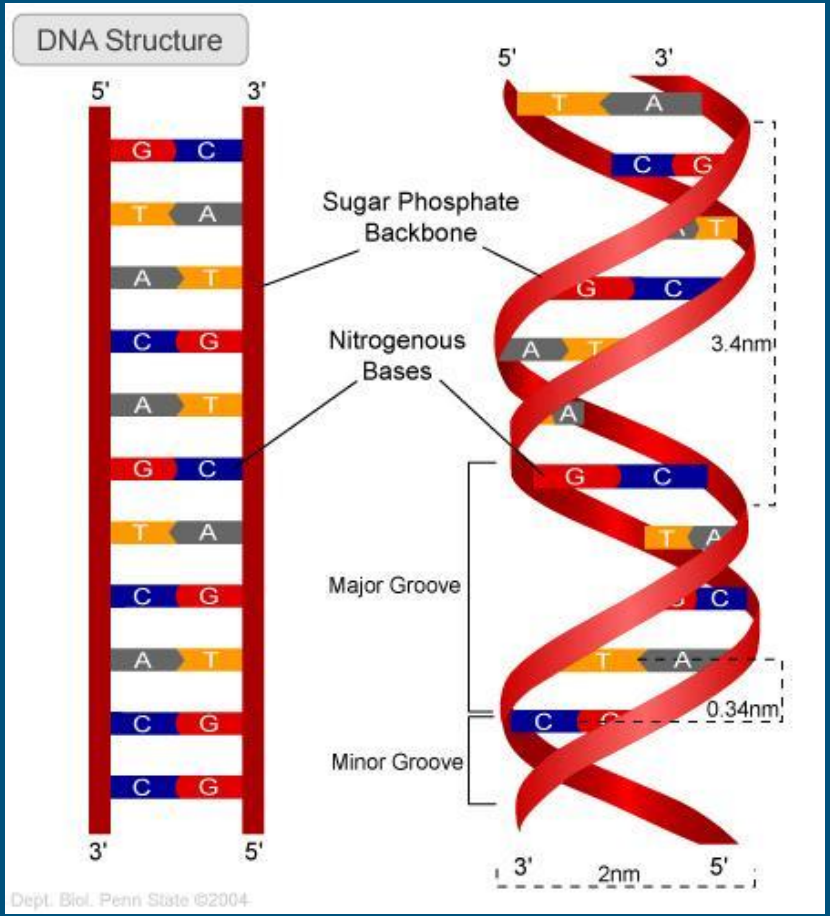


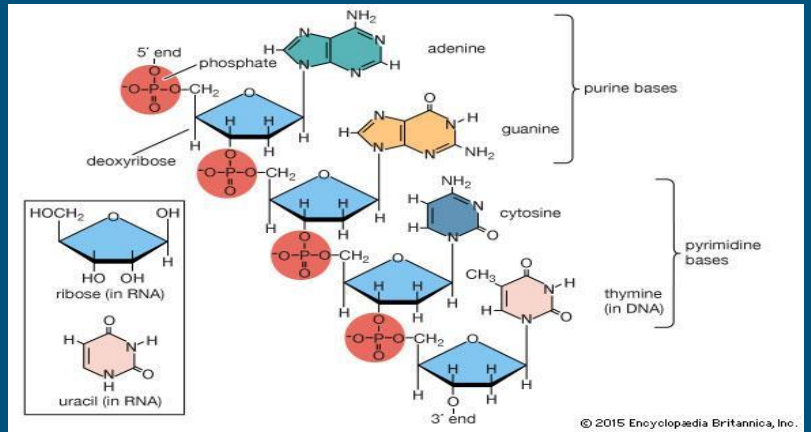




DNA Structure & Function

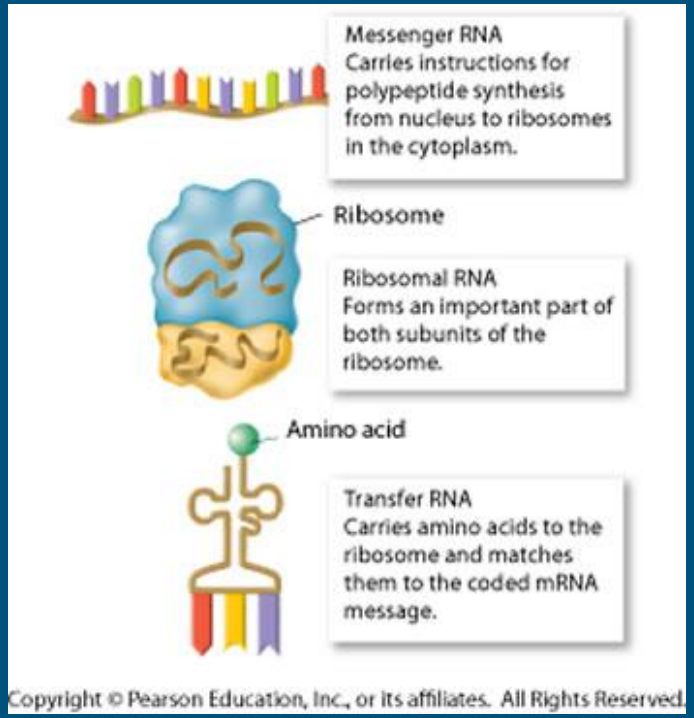
- Double helix
- Sequence of nucleotides = coded information
  - A-T: adenine and thymine
  - C-G: cytosine and guanine



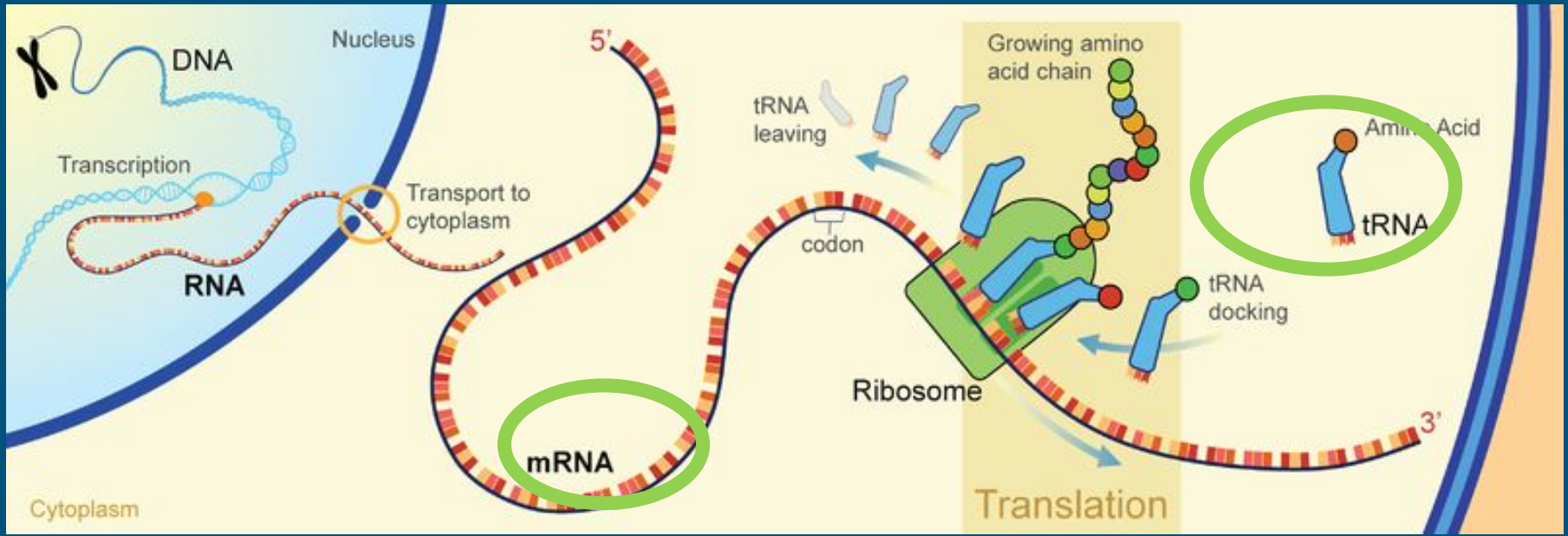


DNA - a template for RNA transcription

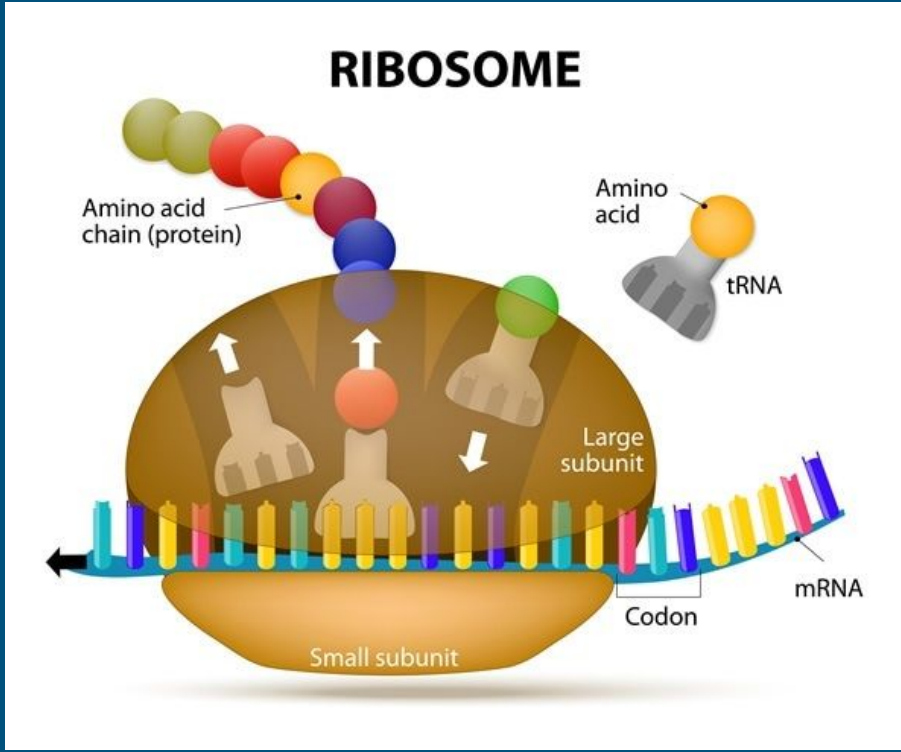
- RNA = ribonucleic acid
  - Single strand
- Specific sequence of DNA(gene) transcribed into RNA
  - **mRNA**
  - tRNA
  - rRNA

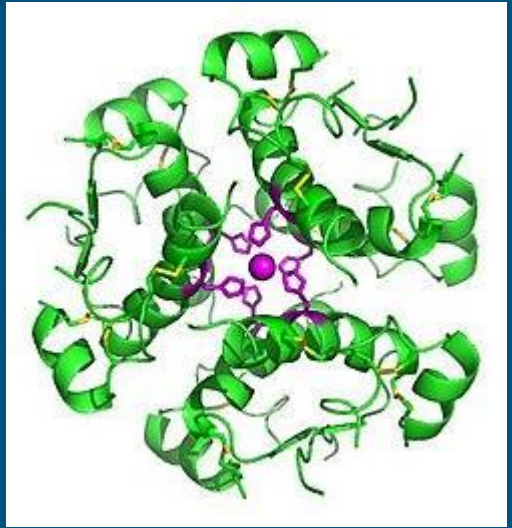


Protein coding: RNA

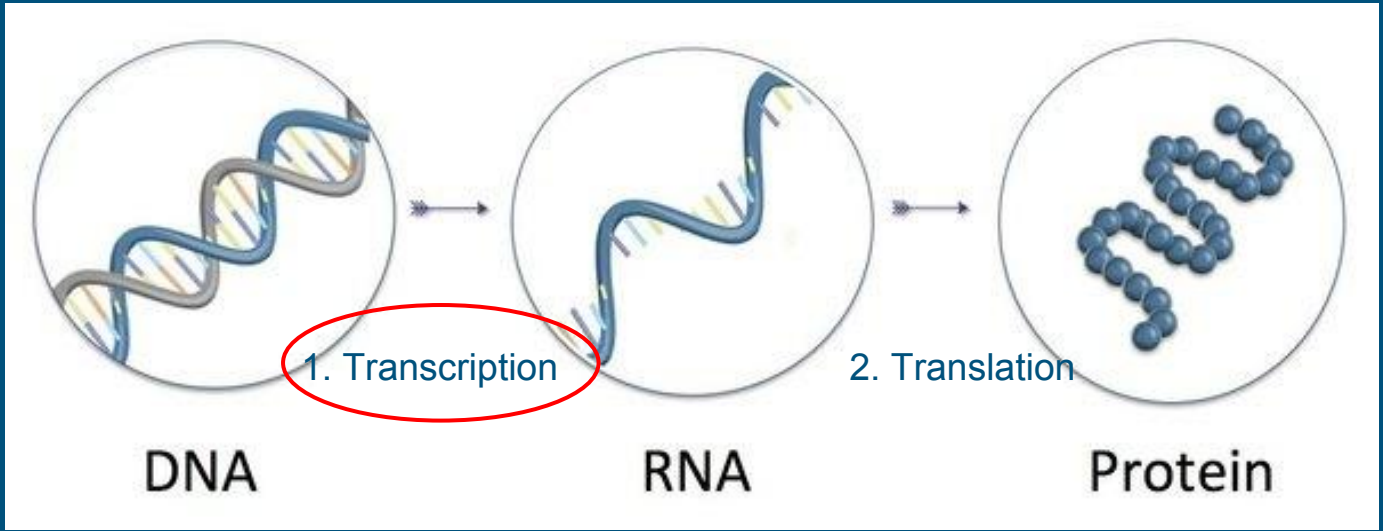


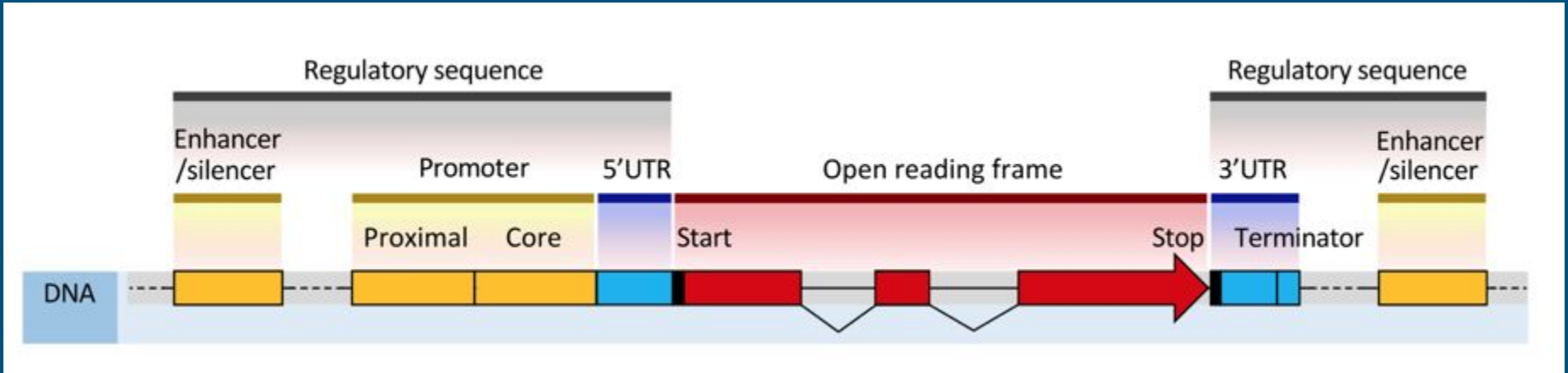
RNA -> Protein by Translation





Regulating Gene Expression




Regulatory sequence
Regulatory sequence
Enhancer /silencer
Promoter
5'UTR
Open reading frame
3'UTR
Enhancer /silencer
Proximal
Core
Start
Stop
Terminator
DNA

Questions?

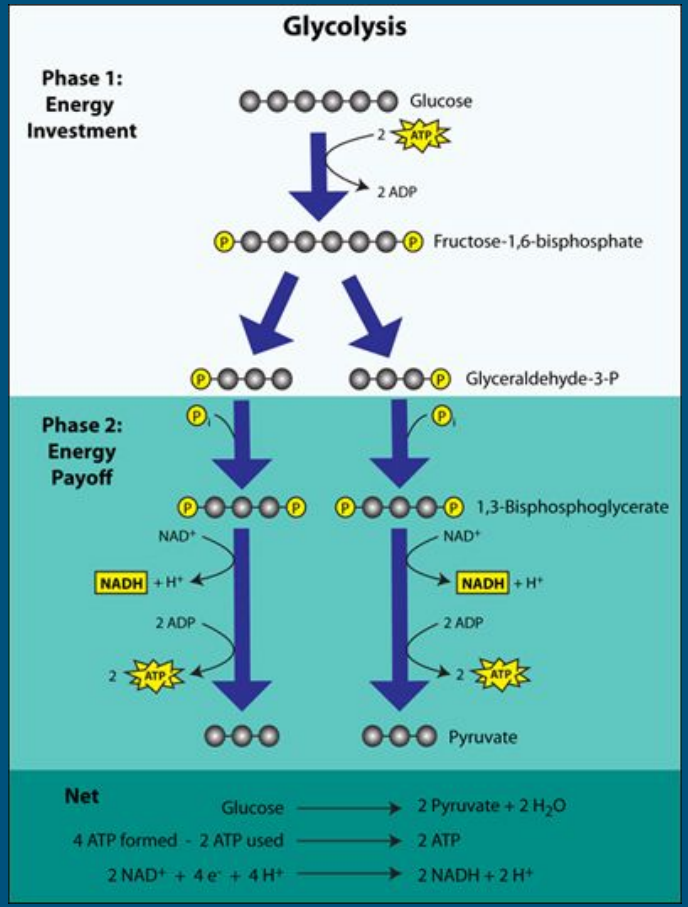
Project Ideas!

1. Metabolomic Modeling in a Cell-Free System

What are Metabolic Pathways?

A chain of Chemical Reactions in a cell:

An enzyme does something to substrates.



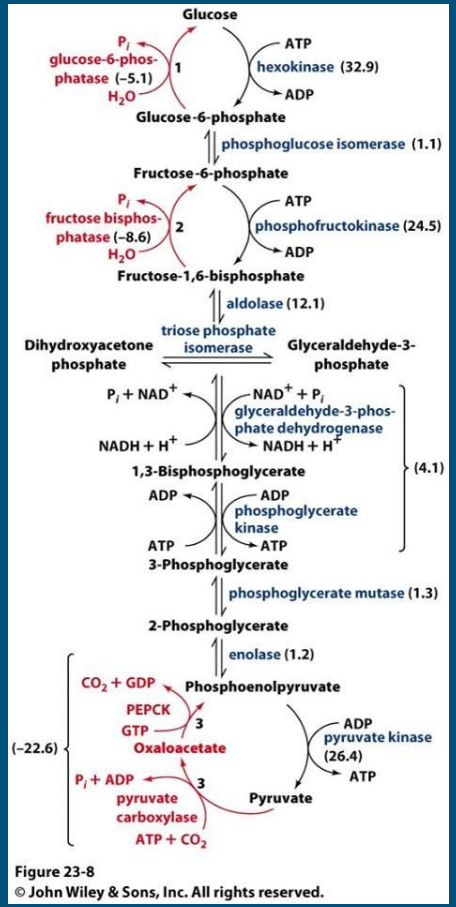
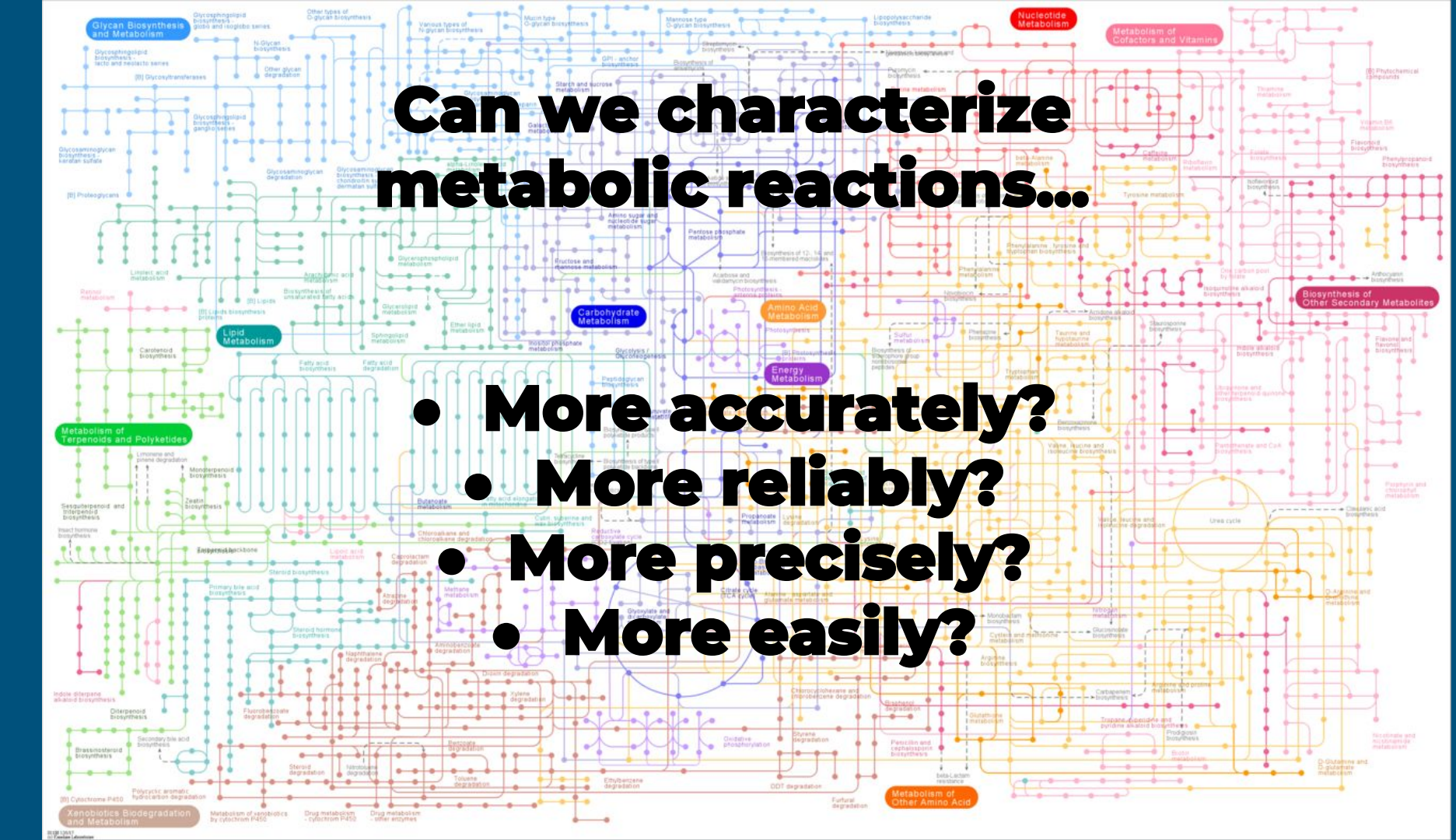


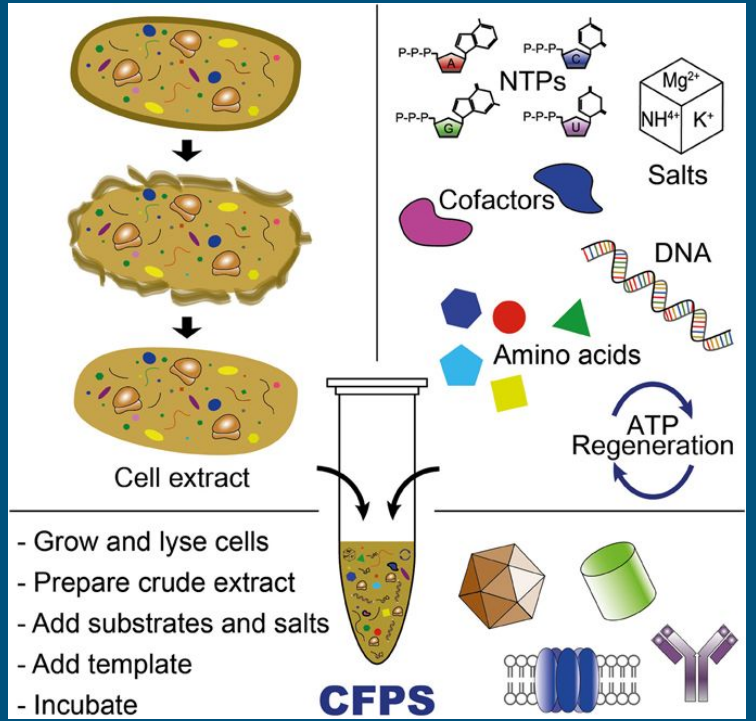
Figure 23-8

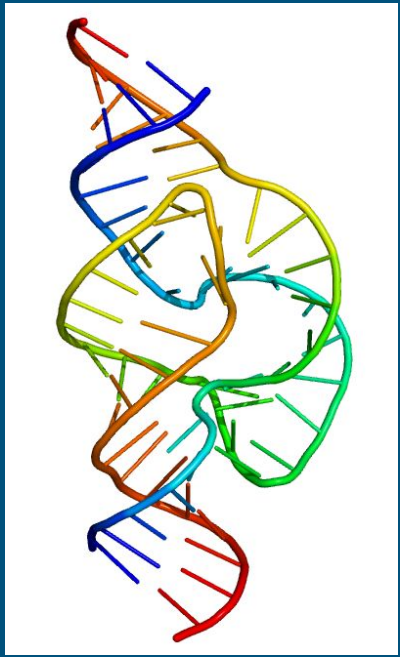


Can we characterize metabolic reactions...

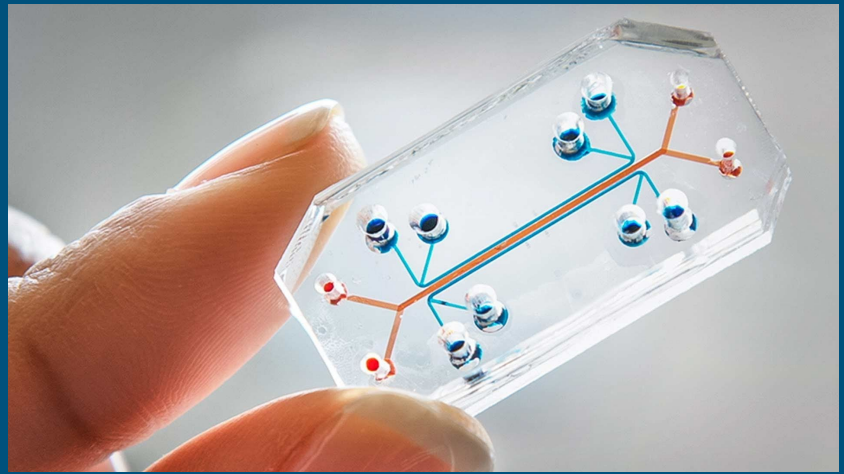
- More accurately?
- More reliably?
- More precisely?
- More easily?

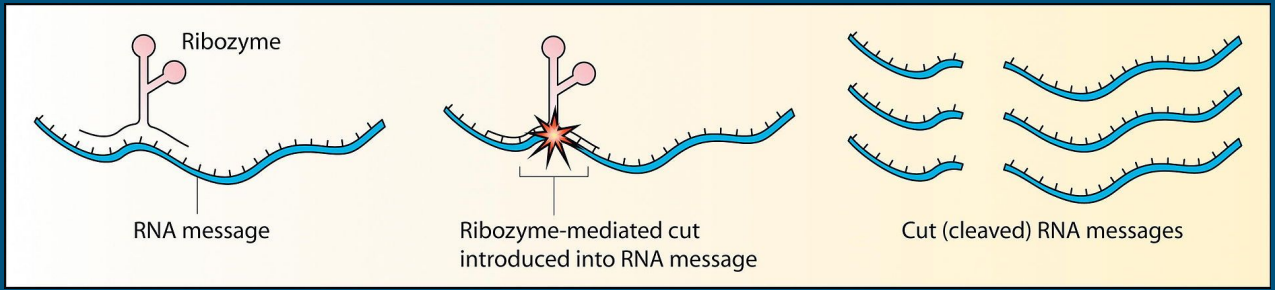
Accuracy + Reliability





Precisely + Easily

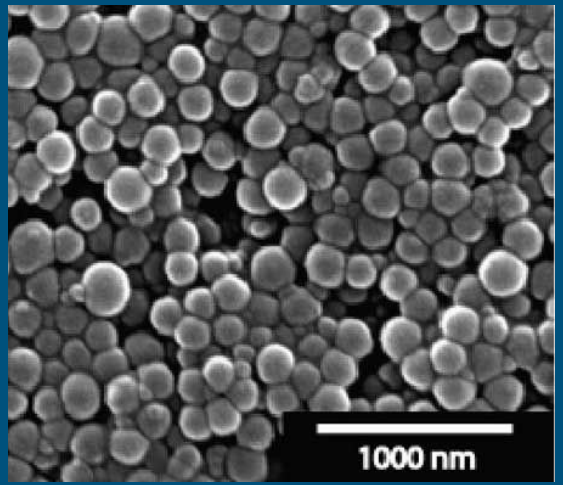




2. Iron or Mercury Remediation via Encapsulation

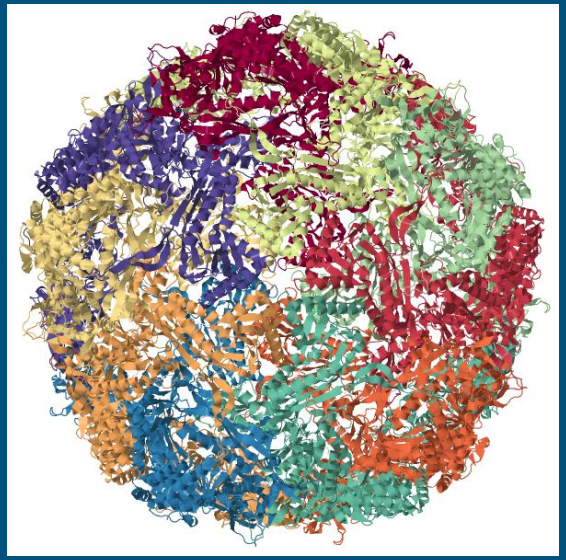
- How do we solve this?

- And make this?

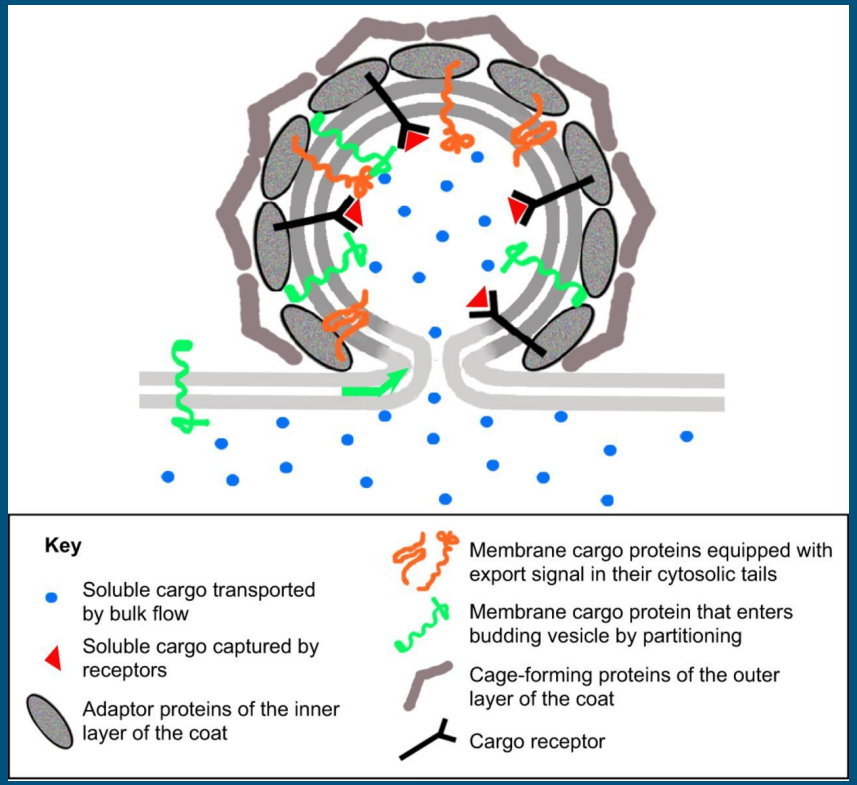


Encapsulins!

- Capture iron particles with proteins
- Reduce iron



A little on the Mechanism

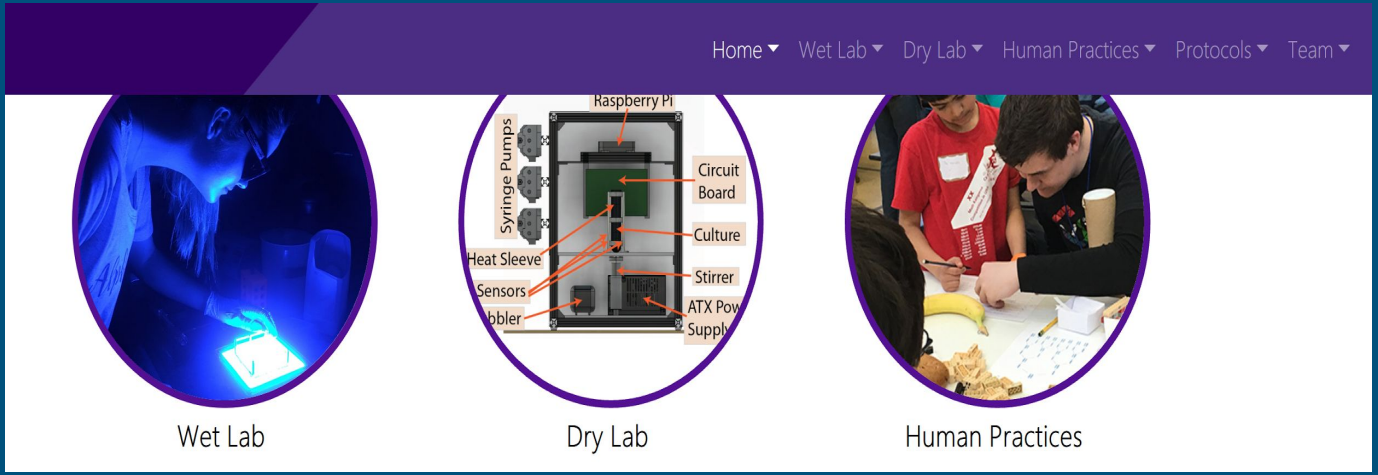


iGEM Deliverables

What we need for a successful project:

- Wiki
- Poster
- Interlab
- Biobrick Part or Device
- Collaboration
- Human Practices
- Proof of Concept
- Modeling and Real world application
- Presentation

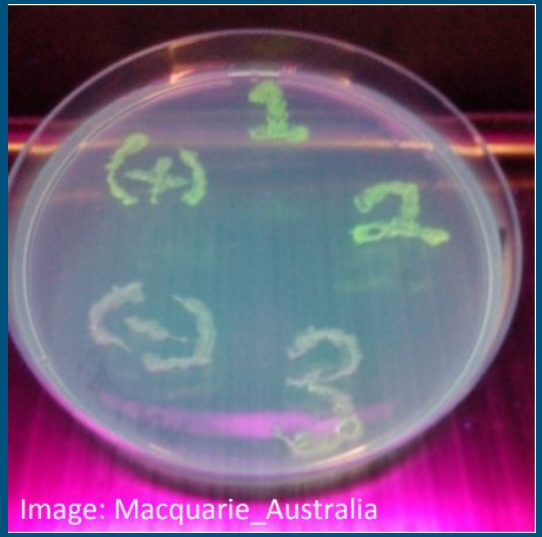
Wiki and Poster



- Show off what awesome work we did online!
- Wiki: Overview and documentation of our project on our website
- Poster: Overview of our project on a poster
    - More concise version of the Wiki

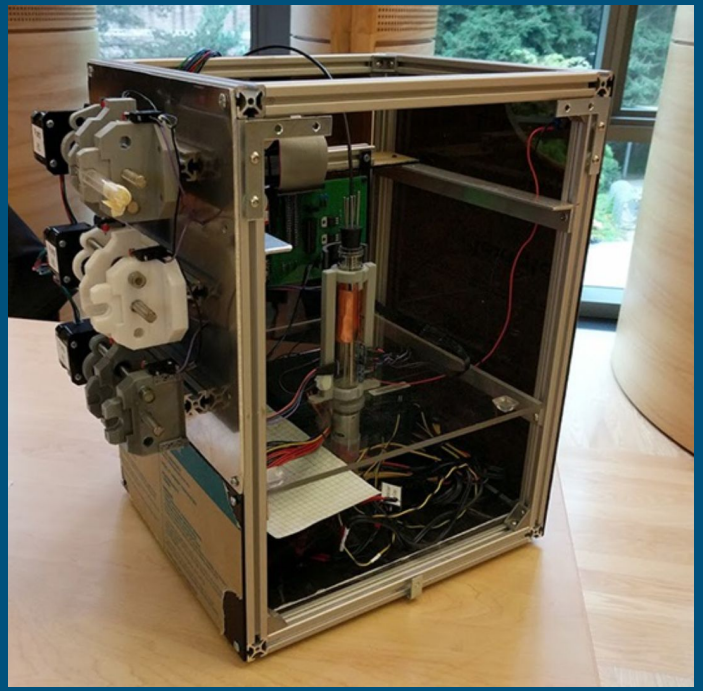
Interlab

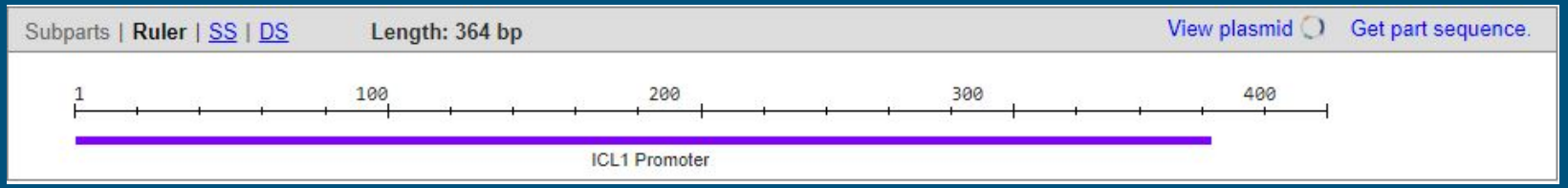
- Participate in the largest, global experiment ever
- Importance of reliable and repeatable measurements



Biobrick

- Create and submit a biobrick (synthetically created piece of DNA) and/or a device that is central to the project
- Experimentally validate biobricks
- Improve existing biobricks submitted by teams in past years





Collaboration

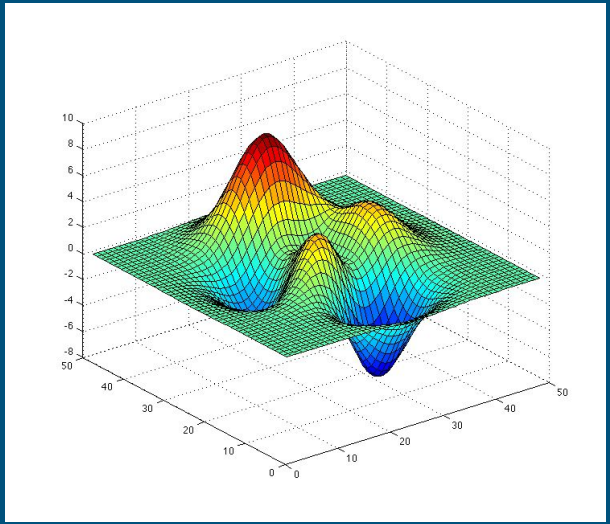
- Collaborate with another team (high school, university, institution)
- Potential collaboration purposes:
  - Mentor another team
  - Help them on their project by debugging, modelling, or validating their project

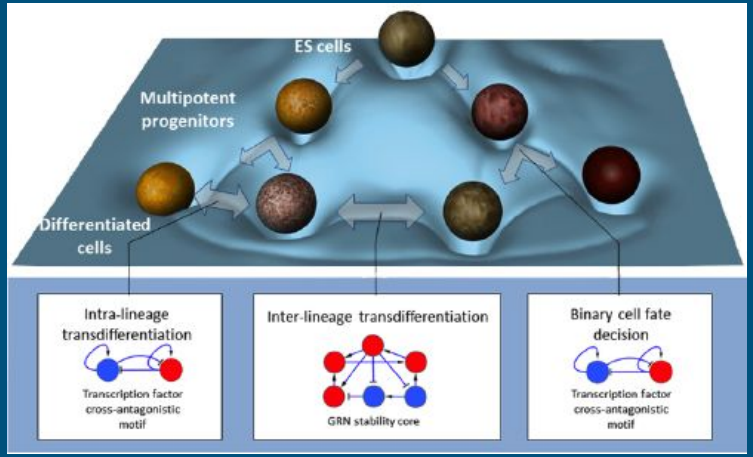
Human Practices

- Engagement with community and public
- Explore important issues with ethics, publicity, policy, education etc.
- Takes the form of
  - Outreach
  - Business
- Hopefully well integrated with our project

Modeling

- Model/simulate the project to show insight about the project’s design and implementation





Presentation

- Present the project at the iGEM Giant Jamboree conference in Boston!

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General Q & A Time!

Reminders:
- Fill out the spring quarter classes survey!
- This Powerpoint will be sent out :)

DRYLAB:
1. We will send a skills survey soon for all drylab.

WETLAB:
1. There will be interviews for wetlab! Sign ups will be emailed out by Sunday!