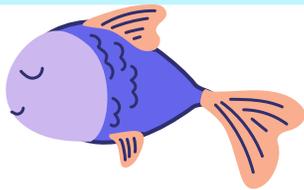
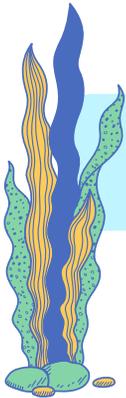


Peek-a-Bio!

A birds-eye view of the world of Synthetic Biology

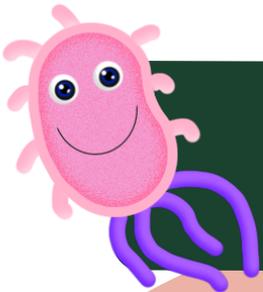
Can we make fish glow?



How iGEM is changing Synthetic Biology



How do scientists study microorganisms?



iGEM IISER Bhopal

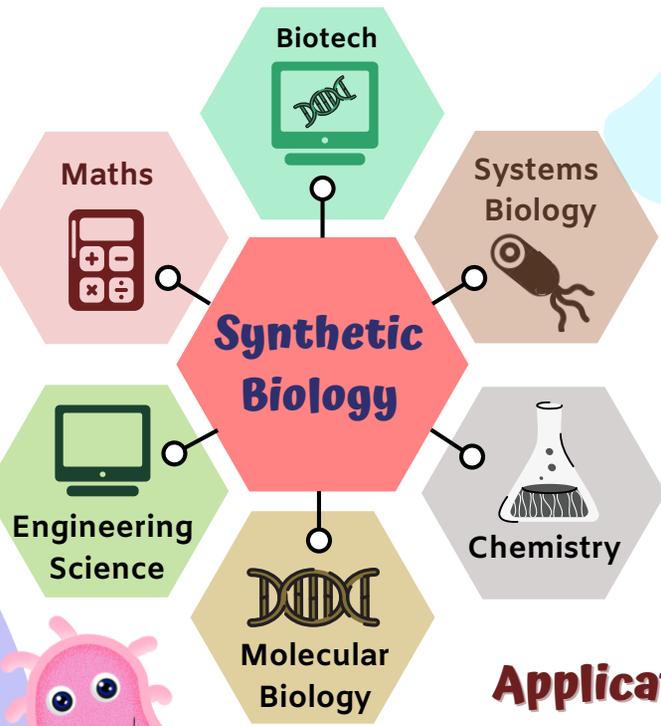
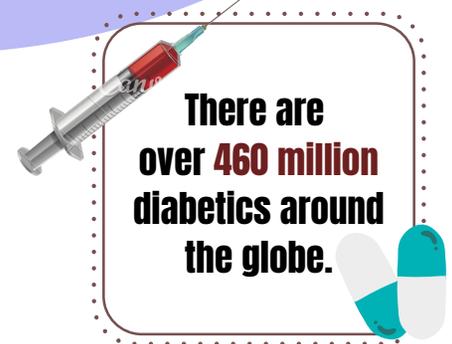
What is Synthetic Biology?

The science of redesigning organisms for useful purposes by engineering them to have new abilities.



Our Project!! The BIG PIE

We're tackling one of the world's largest healthcare issues - **'Diabetes'**. Our novel, non-invasive approach aims to replace insulin injections with a capsule containing probiotic bacteria which will colonise the gut & help the body secrete insulin.



BioBricks LEGO for Scientists!

BioBricks are manmade DNA fragments that can be assembled just like LEGO and inserted into bacteria.

Applications of SynBio

End the COVID-19 Pandemic

Glowing Fish, rabbit, mice...

Colonising Mars!!!

Fun Fact!!

E.coli can double its population every 20 minutes in nutrient rich growth medium & has a record of 11 Nobel prizes associated with it!

Useful YouTube Videos



What does the Pancreas do?

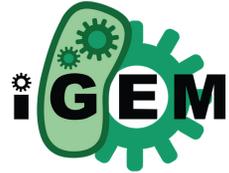


What did dogs teach humans about diabetes?



How Bacteria Rule Over your body - The Microbiome

*Click on the image to watch the video. (Credits: TEDEd and Kurzgesagt)



The **International Genetically Engineered Machine (iGEM)** Foundation organises the annual iGEM competition to promote Synthetic Biology among the youth.

Why iGEM??



1

You get to work on your **OWN** project for a year



2

Interaction with iGEMers all over the world



3

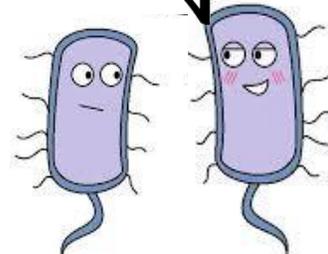
Experience
Trust us...it's worth it!!



Did you know?

Less than one percent of bacteria cause disease

Would you like some plasmid?



A Few Interesting Projects



Catechewing Coli

RUIA MUMBAI

Ruia Mumbai 2018

Catechewing coli is a stain-degrading genetically engineered bacterium which is designed to degrade stubborn paan (betel leaf) stains which deface monuments & railway stations in India and other South Asian countries.

CoCa coli

IISER Tirupati 2019



Coca Coli is a bacterium that helps combat colon cancer in a cost-effective and targeted manner. The bacterium can differentiate tumour cells from healthy cells, bind to them and recruit immune cells to destroy them.

E.L.S.A

E. coli Learning Sub-optimal Acclimatisation

IISER Bhopal 2019



This project aims to develop a cold-tolerant bacterium for the synthesis of proteins of our choice under suboptimal conditions. It can grow at freezing temperatures as efficiently as it would have grown under favourable conditions

*Click on the project name to learn more

WHO CAN PARTICIPATE?



High Schoolers



Undergraduates



Post-graduates



Entrepreneurs



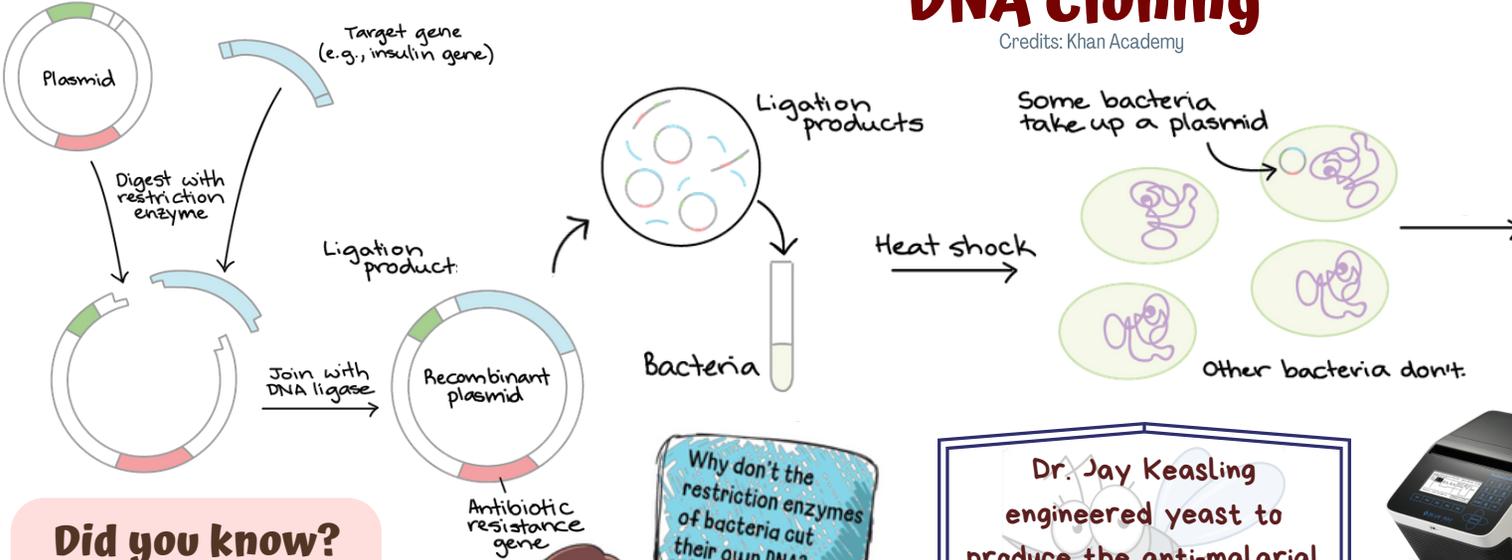
Community labs

Techniques in Molecular Biology

DNA Cloning

Credits: Khan Academy

Restriction Enzymes are like molecular scissors & DNA Ligase is like molecular glue



Place bacteria on antibiotic plate

Colony

Bacteria without a plasmid die. Each bacterium with a plasmid makes a colony.

Did you know?
The first gene edited babies were born in November 2018.



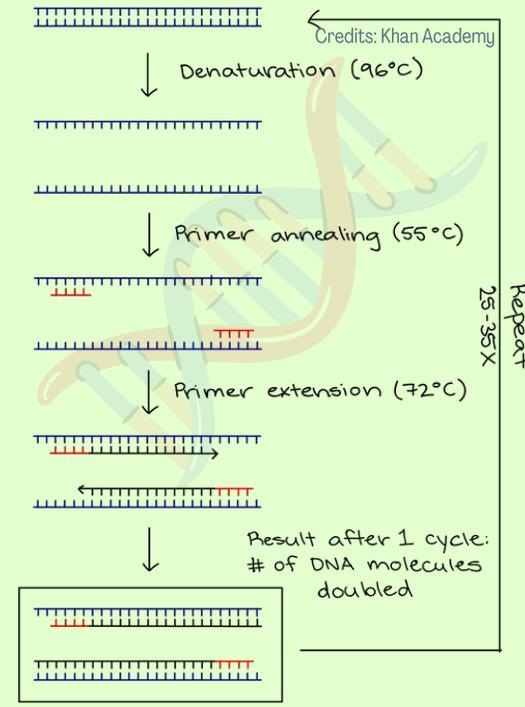
Why don't the restriction enzymes of bacteria cut their own DNA?

Dr. Jay Keasling engineered yeast to produce the anti-malarial drug Artemisinin on a large scale

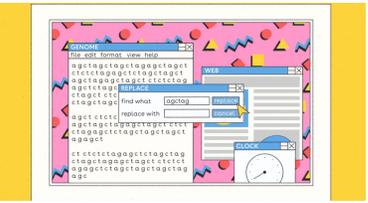


Polymerase Chain Reaction (PCR)

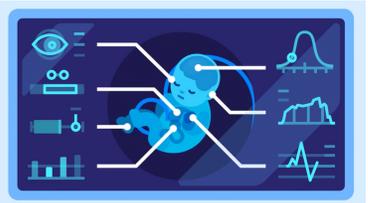
PCR is a technique to amplify a particular region of DNA *in vitro*.



Useful YouTube Videos



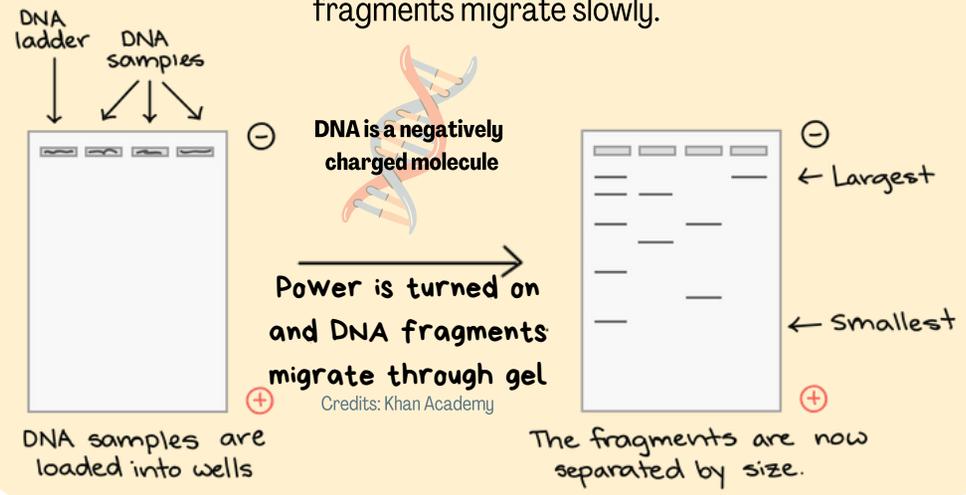
How does CRISPR let you edit DNA?



Genetic Engineering will change everything forever - CRISPR

Gel Electrophoresis

Technique to separate DNA fragments based on charge and size. Larger fragments migrate slowly.



*Click on the image to watch the video (Credits: TEDEd and Kurzgesagt)

**Click on the technique titles to learn more about them