INSTRUCTIONS – Print on heavy paper (260gsm) or thin card and turn printed card round to print onto the back using the same numbered page, then cut out round outside edge of each playing card

1.
front

WHAT RESEARCH WOULD YOU FUND?

© iStock.com/Jaminwell

£1.5 MILLION
FUNDING NEEDED

Turbo Charging Photosynthesis

Aim - To optimise photosynthetic processes in plants to increase growth rates

WHAT RESEARCH WOULD YOU FUND?

© iStock.com/HayKirdy

£3 MILLION
FUNDING NEEDED

Antimalarial Drugs from Yeast

Aim - Engineer yeast to produce the antimalarial drug, Artemisinin

WHAT RESEARCH WOULD YOU FUND?

© iStock.com/Vlad Karavaev

£2 MILLION
FUNDING NEEDED

Arsenic Biosensor

Aim - To develop a sensor to detect arsenic contamination in water supplies

WHAT RESEARCH WOULD YOU FUND?

© iStock.com/Kickers

£0.5 MILLION
FUNDING NEEDED

Bioluminescent Plants

Aim - To promote DIY biology

INSTRUCTIONS – Print on heavy paper (260gsm) or thin card and turn printed card round to print onto the back using the same numbered page, then cut out round outside edge of each playing card

Project
Antimalarial Drugs from Yeast

The anti-malarial drug, Artemisinin, is derived from the herb *Artemisinin annua*.

However, it is very expensive to extract from the plant. Our alternative strategy involves taking the genetic machinery that makes a related chemical in the plant and placing it in Brewer's yeast. The chemical can then be simply converted into the drug. This way we can make Artemisinin more cheaply and without having to use valuable land to grow the herb. The cheaper drug will then be available to many more people affected by malaria each year.

£3 MILLION
FUNDING NEEDED

Project
Turbo Charging Photosynthesis

Photosynthesis is the process by which crops fix the energy from sunlight into energy for growth.

However, it's actually a very inefficient process in plants. Green algae are much better at capturing sunlight and we are going to learn from them. We will do this by taking the genetic code for a carbon fixing enzyme, called RuBisCO, from algae and transplanting it into plants. This will turbo charge plant photosynthesis.

£1.5 MILLION
FUNDING NEEDED

Project
Bioluminescent Plants

This project aims to engineer the plant, *Arabidopsis thaliana*, to glow in the dark by expressing the firefly gene, luciferase.

There is no commercial value in this product but we hope to promote DIY biology and a greater understanding of synthetic biology among school children and the general population. Members of the public can request seeds from which the glowing plants can be grown. These will be fun, decorative and educational.

£0.5 MILLION
FUNDING NEEDED

Project
Arsenic Biosensor

Arsenic contamination in water is a global problem and affects around 100 million people, especially those in poor regions of Nepal and Bangladesh.

We need a cheap, robust, but very sensitive method to detect harmful levels of arsenic in water. Our arsenic biosensor does just that: we genetically engineer bacteria to react to tiny amounts of arsenic. When these bugs come into contact with arsenic they produce a pigment that you can see with the naked eye.

£2 MILLION
FUNDING NEEDED

INSTRUCTIONS - Print on heavy paper (260gsm) or thin card and turn printed card round to print onto the back using the same numbered page, then cut out round outside edge of each playing card

WHAT RESEARCH WOULD YOU FUND?

(c) iStock.com/JonasEriksson

£5 MILLION FUNDING NEEDED

Human-Pig Chimera

Aim - To grow human organs in pigs for transplantation

WHAT RESEARCH WOULD YOU FUND?

(c) iStock.com/HayKirdy

£6 MILLION FUNDING NEEDED

Gene Drives to Combat Malaria

Aim - To eradicate malaria by reducing mosquito propagation

WHAT RESEARCH WOULD YOU FUND?

(c) iStock.com/Bernie_photo

£2 MILLION FUNDING NEEDED

Golden Rice

Aim - To combat vitamin A deficiency by increasing the nutritional value of rice

WHAT RESEARCH WOULD YOU FUND?

(c) iStock.com/Sabin

£4 MILLION FUNDING NEEDED

Fight Ocean Pollution with Bacteria

Aim - to engineer bacteria so that they can breakdown plastics in the ocean

INSTRUCTIONS – Print on heavy paper (260gsm) or thin card and turn printed card round to print onto the back using the same numbered page, then cut out round outside edge of each playing card

Project

Gene Drives to Combat Malaria

Malaria is a mosquito-borne infectious disease that kills 400,000 people each year.

Our project will eradicate malaria by genetically engineering the mosquito. We use 'gene drives' which are ways of genetically modifying a mosquito so that the genetic change is inherited by all its offspring. In this way, the gene will propagate across the population. We plan to engineer mosquitos so that the females (which spread the disease) are less fertile. The mosquito population will shrink and with it the risk of malaria.

£6 MILLION
FUNDING NEEDED

Project

Human-Pig Chimera

There is a huge shortage of human donors of organs (e.g. heart, kidney, liver) suitable for transplantation.

We plan to use genetic engineering (using a new gene editing technology called CRISPR) and stem cell technology to create pigs which grow human, rather than pig, organs. These can then be harvested for transplantation to humans in need of new organs.

£5 MILLION
FUNDING NEEDED

Project

Fight Ocean Pollution with Bacteria

Every year, around 8 tons of plastic ends up in our oceans with deadly consequences for marine life.

Our team thinks we can engineer bacteria to secrete enzymes that can break down polyethylene terephthalate (PET), commonly found in plastics. These harmless bacteria (called ***Escherichia coli***, found in the human gut) would be encapsulated in floating bioreactors in the ocean where they will break down PET-containing plastics.

£4 MILLION
FUNDING NEEDED

Project

Golden Rice

Vitamin A deficiency is a world-wide problem, which can result in blindness, stunted growth and immunodeficiency disorders, killing over 670,000 children each year.

We will make 'Golden rice,' which is a strain of rice genetically engineered to biosynthesize beta-carotene, a precursor to vitamin A. Our rice will produce 23 times more carotene than regular rice, and thus could reduce the prevalence of vitamin A deficiency in rice-growing regions of the world.

£2 MILLION
FUNDING NEEDED

INSTRUCTIONS - Print on heavy paper (260gsm) or thin card and turn printed card round to print onto the back using the same numbered page, then cut out round outside edge of each playing card

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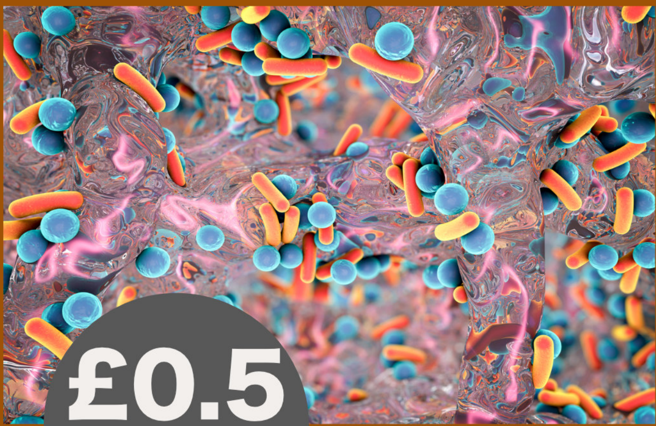
WHAT RESEARCH WOULD YOU FUND?


(c) iStock.com/Dr Microbe

£0.5 MILLION
FUNDING NEEDED

Bacterial Biofilms

Aim - to produce biopolymers from bacteria

WHAT RESEARCH WOULD YOU FUND?


(c) iStock.com/agrobacter

£1 MILLION
FUNDING NEEDED

Insulin Producing Bacteria

Aim - to produce human insulin to treat diabetes

WHAT RESEARCH WOULD YOU FUND?


(c) iStock.com/stevanovicigor

£3 MILLION
FUNDING NEEDED

Greener Biofuels

Aim - to improve biofuel production yields from crops

WHAT RESEARCH WOULD YOU FUND?


(c) iStock.com/ryasick

£2 MILLION
FUNDING NEEDED

Spider Goats

Aim - to produce spider's silk from goat's milk

INSTRUCTIONS – Print on heavy paper (260gsm) or thin card and turn printed card round to print onto the back using the same numbered page, then cut out round outside edge of each playing card

Project

Insulin Producing Bacteria

Insulin is a hormone that regulates sugar levels in the blood

People who suffer from diabetes may have such low levels of insulin that they need to inject themselves with the hormone daily. Most insulin today (around 70%) is made by expressing the genes for human insulin in bacteria. We want to optimise the production process, by engineering the bacteria further, to make it more efficient and hopefully cheaper.

£1 MILLION FUNDING NEEDED

Project

Bacterial Biofilms

People have been using biologically-derived materials, such as wool and leather, for thousands of years

We are creating a completely new type of material using synthetic biology. We will use layers of bacteria (biofilms) to manufacture bacterial cellulose. Cellulose is the stuff that makes up plant cell walls. We can then use this to make a range of fun new textiles. We will refine the biofilm production process so we can make a range of different types of textiles at lower cost of production.

£0.5 MILLION FUNDING NEEDED

Project

Spider Goats

Spider silk is one of the strongest materials known to man and has a range of very useful medical applications

But you can’t farm spiders as they have a tendency to eat each other when in close proximity. We have a plan to produce spider silk proteins in the milk of goats. We will take the silk-making genes from a spider and add them to the goat’s milk-producing cells so that silk proteins can be produced in goats’ milk in large quantities. It will then be an easy step to extract the spider silk proteins from milk.

£2 MILLION FUNDING NEEDED

Project

Greener Biofuels

Biofuels are a more sustainable alternative to fossil fuels.

We aim to genetically engineer plants so that they can produce greater yields of biofuel starter materials (e.g. sugars or oils). By making more biofuel from the same amount of crop, we can reduce the amount of land needed, leaving more for supplying food for our growing global population.

£3 MILLION FUNDING NEEDED