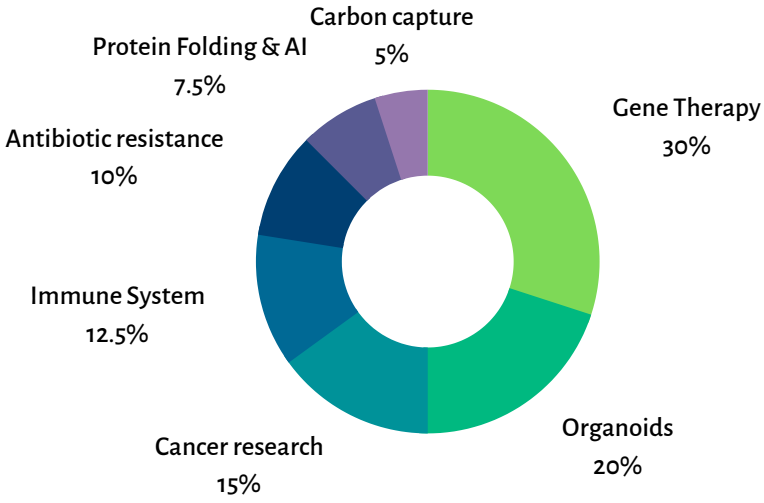
"YOU HAVE ONE BILLION POUNDS TO SPEND ON RESEARCH: HOW ARE YOU GOING TO USE THEM?"



One billion pounds is barely sufficient to satisfy the desire of the scientific research community. We recognise that the nature of research is to continuously push the human boundaries of knowledge, and such an eternal goal, so we allocated this funding to maximise the benefit to humanity. Therefore we decided to prioritise scientific research with the most tangible immediate impact, which we believe to be in the fields of health and environment.

30% : GENE THERAPY

Gene therapy is an emerging experimental technique that promises to treat diseases by introducing new genes to the cells to restore and add gene expression, or by introducing therapeutic proteins into the body. This therapy will provide a new lease of life for people suffering from debilitating genetic-disorders and life-threatening illnesses. Several trials demonstrating the potential for gene therapy are outlined below.

▶ Ischaemic heart disease currently remains the leading cause of death, equating to 16% of all deaths per year. Heart attacks cut off blood supply to the heart causing the death of muscle cells, resulting in immediate death or the development of chronic heart failure. Most of these fatalities are attributable to problems with the hearts' Sinoatrial Node (SAN) cells [1]. These specialised cells act as the natural pacemaker of the heart and initiate electrical impulses that pass through cardiac muscle to cause contraction. Patients with a life-threatening condition incurable by an electronic pacemaker currently have no alternative, however, current research has demonstrated that injecting the Tbx18 gene into cardiac muscle cells can transform normal heart cells into specialised SAN cells.

▶ Spinal Muscular Atrophy (SMA) is caused by a genetic defect resulting in the destruction of motor neurons in the brainstem and spinal cord. It's a crippling illness that progressively deteriorates muscles and gradually leads to paralysis. However, a new proprietary gene therapy called Zolgensma is designed to address the root cause of the disorder, by providing a functional copy of the Survival Motor Neuron gene, to halt the defective gene progression [2].

The majority of gene therapy treatments are extremely expensive, with Zolgensma currently costing over two million dollars. However, with more research, there will be a chance of more affordable and equally effective therapies, just waiting to be engineered.

20% : DEVELOPING ORGANOIDS

Genetically identical tissues can be produced to supplement and eventually replace areas of the human body. Currently, Bioengineers have focused on the development of organoids that can accurately resemble and behave like their real counterparts, however, the next stage in this research is bringing lab-grown science to the patients suffering from damaged organs.

Organoid tissues are developed using undifferentiated stem cells that are stimulated to multiply around a laser-printed hydrogel scaffold (consisting of cross-linked proteins). Extensive research on recreating the inner lining of the intestine resulted in many successes. The gut tissue scaffold was covered in stimulated stem cells which arranged themselves with structures found in the gut, for example, crypt structures, enabling the organoid to function like real intestinal tissue [3]. More research into tissue engineering could enable us to utilise this approach as a solution to other vital organ defects. Developing organoids could also complement animal testing and speed up the process from lab to clinical trials, ultimately providing a more precise efficacy of the drug.

15% : CANCER RESEARCH

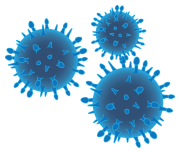
Cancer research is currently a huge movement, but it is essential to tackle the fundamental questions, enabling us to understand the bigger picture. Statistics show that almost half of cancer patients are diagnosed too late, to tackle this, Scientists have developed new methods of detecting the presence of cancer in blood via liquid biopsies before it is too late to manage [4].

Broader knowledge of the nature and mechanism of cancer, achieved by more epidemiological research will pave the way to further studies and early detection of cancer. This will facilitate more clinical (drug) testing to assess the potential for a better-targeted cure or an effective method of management.

12.5% : UNDERSTANDING OUR IMMUNE SYSTEM

The immune system remains one of the most powerful tools in the human body to defend against disease yet it can be equally as destructive when it targets the body's own proteins. Through a greater understanding of our immune system, Scientists can develop potential treatments for cancer, autoimmune diseases and severe allergies. Recently, researchers have developed new methods of managing immune system responses via targeted pharmacological control of ion channels [5]. This could potentially replace the need for immunosuppressants and steroids which are heavily prescribed for autoimmune diseases.

10% : SOLUTION FOR ANTIBIOTIC RESISTANCE



Antibiotic resistance is on the rise and poses a major threat to the human race, if not addressed immediately. Despite the production of new medicines to combat this, bacteria are endlessly mutating. Since research into the solution for antibiotic resistance is currently underfunded, we aim to provide the costs to cover additional studies to find new ways of stopping bacterium from mutating, in order to prevent an unmanageable epidemic of disease.

7.5% : PROTEIN FOLDING & AI

Proteins, each with a unique 3D structure, underpin every biological process, but we only know a fraction of them. Artificial intelligence, however, has enabled us to accurately predict the way a protein will fold, based on the sequence of amino acids. This scientific breakthrough, achieved by DeepMind's Alphafold software, could accelerate research in the field of biology and lead to the discovery of new medicines, as well as helping us understand diseases caused by genetic variation [6]. Nonetheless, there are undoubtedly further developments to be made in this field- including how multiple proteins form complexes and how they interact with other small molecules. This development illustrates the important role that AI will have in advancing the life sciences sector and, in particular, drug discovery [7].

5% : CLIMATE RESEARCH

Whilst Scientists are hesitant about using nanoparticles in medicine, it has proved successful in reducing the rapid effects of global warming. Such as the use of nano-adsorbents for increased carbon capture in addition to the use of artificial photosynthesis to convert carbon dioxide into liquid fuels [8]. Despite global efforts with renewable energy sources, the world is still predominantly powered by fossil fuels and we are unlikely to reduce that contribution, therefore we aim to invest in the research of further carbon-capture technologies.

A budget plan formulated by [redacted]

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