

# WHAT IS INNOVATION?

A new tool or approach to either:

- achieve a new outcome we cannot achieve today;
- or
- achieve an existing outcome faster, better and/or with fewer resources



# WHAT IS GRAND CHALLENGES?

## A family of initiatives & network of partners seeking to:

- Engage the world's most creative minds from across sectors, organizations and geographies
- Support high-risk, high-reward innovations on the most difficult and pressing issues
- Bring innovation to scale for the benefit of the world's poor

## Grand Challenges Sources Innovations and Collaborates to Accelerate Innovations to Impact



# WHAT IS GRAND CHALLENGES? INNOVATORS AND INNOVATIONS



## SUPPRESSING MOSQUITO REPRODUCTION

Project: Distorting the sex ratio of malaria-transmitting mosquitoes using "selfish genes"

Researcher: Austin Hart, Imperial College London, UK  
Program: Grand Challenges in Global Health



## ELIMINATING DENGUE FEVER

Project: Blocking dengue virus transmission by mosquitoes using Wolbachia bacteria

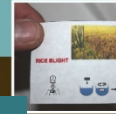
Researcher: Scott O'Neill, University of Queensland, Australia  
Program: Grand Challenges in Global Health



## NANOEMULSIONS FOR NASAL VACCINES

Project: Using nanoemulsions as adjuvants to boost needle-free vaccine efficacy

Researcher: James R. Baker, University of Michigan  
Program: Grand Challenges in Global Health



## ANTIBACTERIAL BUSINESS CARDS

Project: Treating infected crop plants using biocontrol business cards incorporated with viruses that kill harmful agricultural pests

Researcher: Peter Simons, University of California, Davis  
Program: Grand Challenges in Global Health



## HOW MILK DOES A JOEY GOOD

Project: Studying how eucalypt milk helps joeys grow faster by increasing their immune system to help them fight off diseases from their environment of eucalyptus

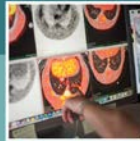
Researcher: David Hosker, Commonwealth Scientific and Industrial Research Organisation  
Program: Grand Challenges in Global Health



## AN INVISIBLE BEDNET

Project: Using infrared light—the kind that comes from TV remote controls—to repel malaria-transmitting mosquitoes

Researcher: David Horsfield, Imperial College London  
Program: Grand Challenges in Global Health



## ELIMINATING TB WHERE IT HIDES

Project: Imaging tuberculosis infections in situ to help guide drug design

Researcher: Douglas Young, Imperial College London  
Program: Grand Challenges in Global Health

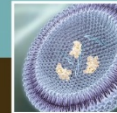
Funders: Wellcome, FNIH, Bill & Melinda Gates Foundation



## DRONES FOR VACCINES

Project: Developing unmanned aerial vehicles that can be deployed by cell phones to deliver vaccines to rural locations

Researcher: Christopher Peterson, University of California, Berkeley  
Program: Grand Challenges in Global Health



## POLIOVIRUS IN A BUBBLE

Project: Making a new kind of polio vaccine by enclosing bits of virus in tiny spheres made of fat molecules

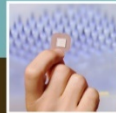
Researcher: David Brown, University of Cambridge  
Program: Grand Challenges in Global Health



## RALLYING THE IMMUNE SYSTEM

Project: Boosting malaria vaccines to trigger both arms of the immune system

Researcher: Adrian Hill, University of Oxford, UK  
Program: Grand Challenges in Global Health



## MICRONEEDLES FOR VACCINES

Project: Developing a microneedle patch to deliver simple and efficiently delivered vaccines

Researcher: Mark P. Callan, University of Cambridge  
Program: Grand Challenges in Global Health



## STINKY SOCKS, NO MALARIA

Project: Using the odor of smelly socks to repel mosquitoes that transmit malaria

Researcher: Christopher Hill, University of Cambridge  
Program: Grand Challenges in Global Health



## CONFUSING THE MOSQUITO NOSE

Project: Deciphering how malaria-transmitting mosquitoes sense humans

Researcher: Deborah Andl, Princeton University, USA & Leslie Vosshall, The Rockefeller University, USA  
Program: Grand Challenges in Global Health



## UNDERSTANDING MALNUTRITION

Project: Using optical brain imaging technology to study cognitive function in malnourished children

Researcher: Clare Davis, University College London, UK  
Program: Grand Challenges Explorations

Funders: Wellcome, FNIH, Bill & Melinda Gates Foundation



## MAKING SANITARY PADS AFFORDABLE

Project: Manufacturing inexpensive but high-quality sanitary pads in Kenya out of locally available agricultural byproducts

Researcher: Megan Murray, Zanzeleka Group, Tanzania  
Program: Grand Challenges Explorations

Funders: Wellcome, FNIH, Bill & Melinda Gates Foundation

~70K Applications from 190 Countries  
>2000 Awards in 87 Countries



# WHAT DOES IT TAKE FOR AN ORGANIZATION TO BE GOOD AT GRAND CHALLENGES?

- An **Appetite for Risk** and a **Tolerance for Failure**
- **Patience** – a willingness to bet on **Long Time Lines**
- Being involved with a **Global Network** that Provides:
  - **Deeper understanding of problems** that need to be solved
  - Understanding of **landscape of opportunity space of solutions**
- A **Trusted Brand** that **Attracts New Talent**
  - And is Trusted as a Partner to Create **Unusual New Collaborations**
- Engagement downstream (e.g. GAVI, AMCs) adding a “**Prize Element**” for success (and to accelerate impact)
- **Human Capital, Financial Resources, Operational Flexibility**

# HOW DO WE SCORE GRAND CHALLENGES?

## Primary Metric

Projects progressed to Clinical Testing

+ Strategic Learning & Landscaping

+ Scientific Knowledge

+ Capacity Development

+ Good ideas funded by others

+ Good ideas funded by others

+ Increased awareness of our issues

+ Strengthen Foundation brand

## Secondary Metrics

ROI =

Project Funding

+

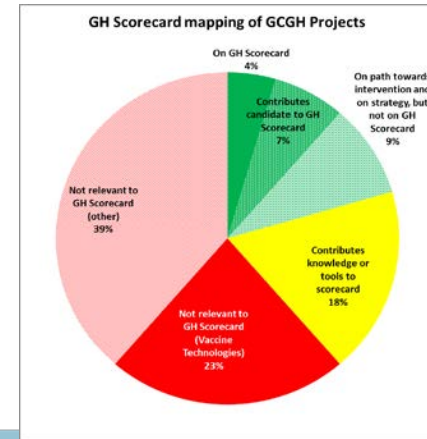
Programmatic & Business operating costs

+

Opportunity costs

## ROI Shortcomings

- Grand Challenge evolution includes increased breadth of project types
  - Clinical testing not always good intermediate benchmark
- What is good?
  - What are appropriate denominators?
  - What are appropriate benchmarks?



# HOW DO WE CELEBRATE 10 YEARS OF GCE?

Grand Challenges | EXPLORATIONS

# ONE GREAT IDEA

TWO PAGES TO FILL OUT.  
\$100,000 TO PROVE IT.

GREAT IDEAS CAN COME FROM ANYWHERE. ALL CAN APPLY.

# Thank You



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