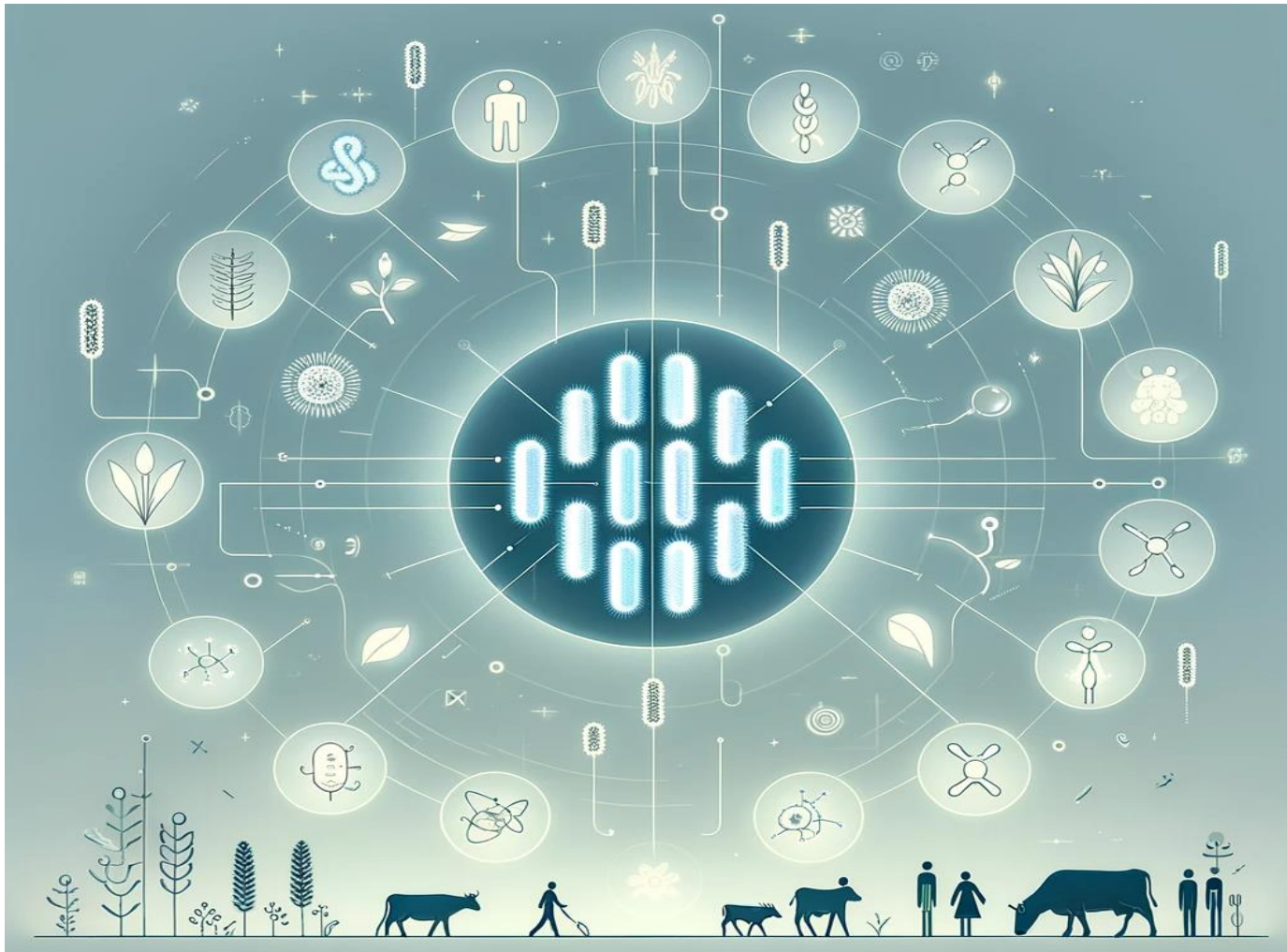


# The TED Audacious Project

Editing of Microbiomes for Health and Environment



Spencer Diamond, Ph.D.  
Principal Investigator  
Diamond Lab

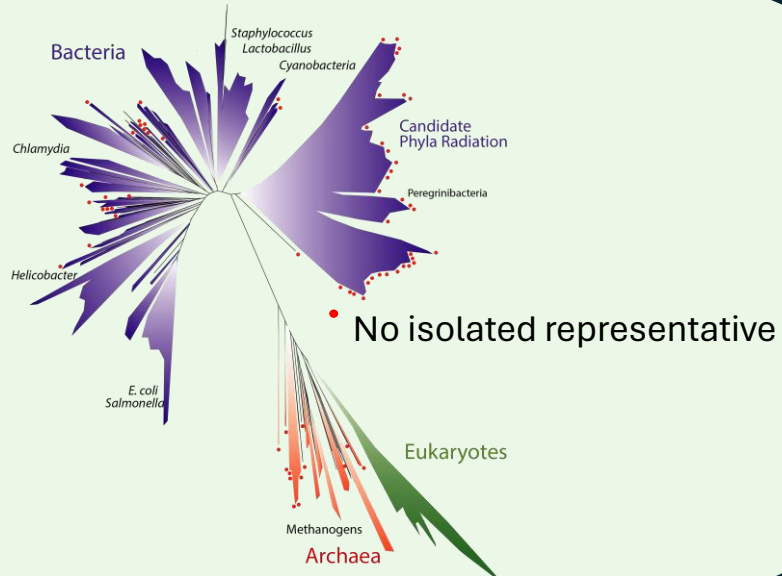


# The Birth of Microbiome Editing

## Genome Resolved Metagenomics



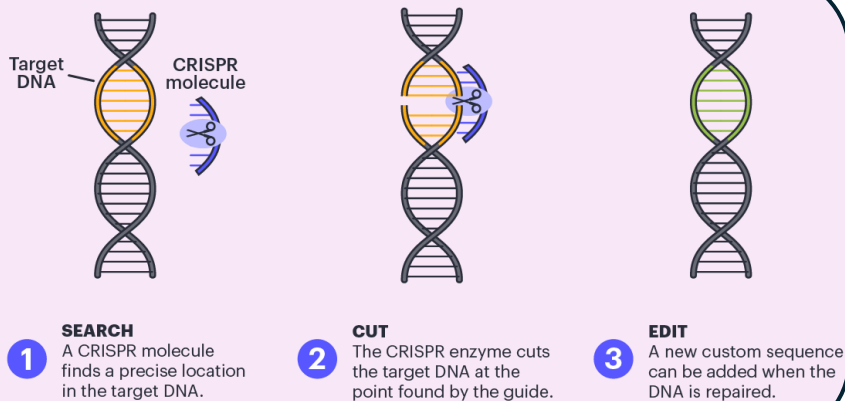
Jill Banfield



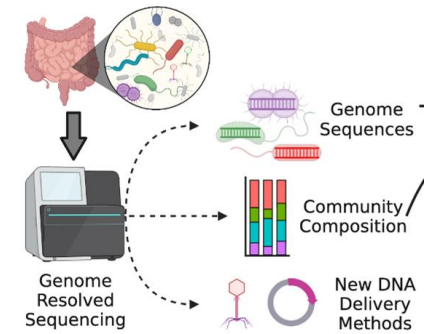
## CRISPR-Cas Targeted Editing



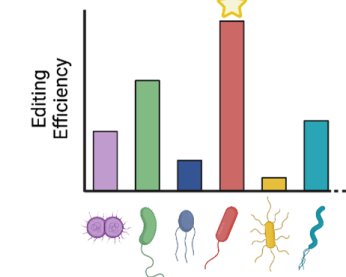
Jennifer Doudna



## Step 1: Sequence DNA of Microbiomes

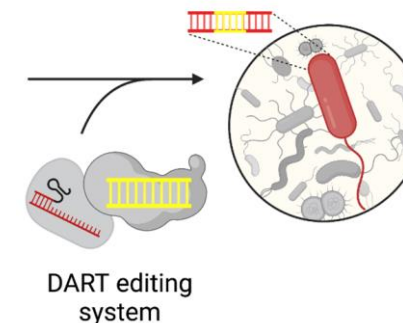


## Step 2: Determine Editable Microbes



## Targeted Community Editing

## Step 3: Make Targeted Edits With New CRISPR-Cas Systems



Publication: Rubin, Diamond, Cress et al., *Nature Micro.*, 2022  
(U.S. Patent 62968644)

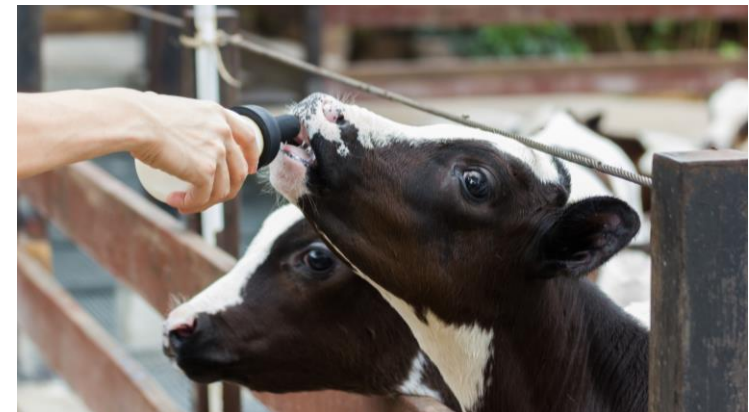


# The TED Audacious Project

Transforming human health and climate change with precision control of microbial communities

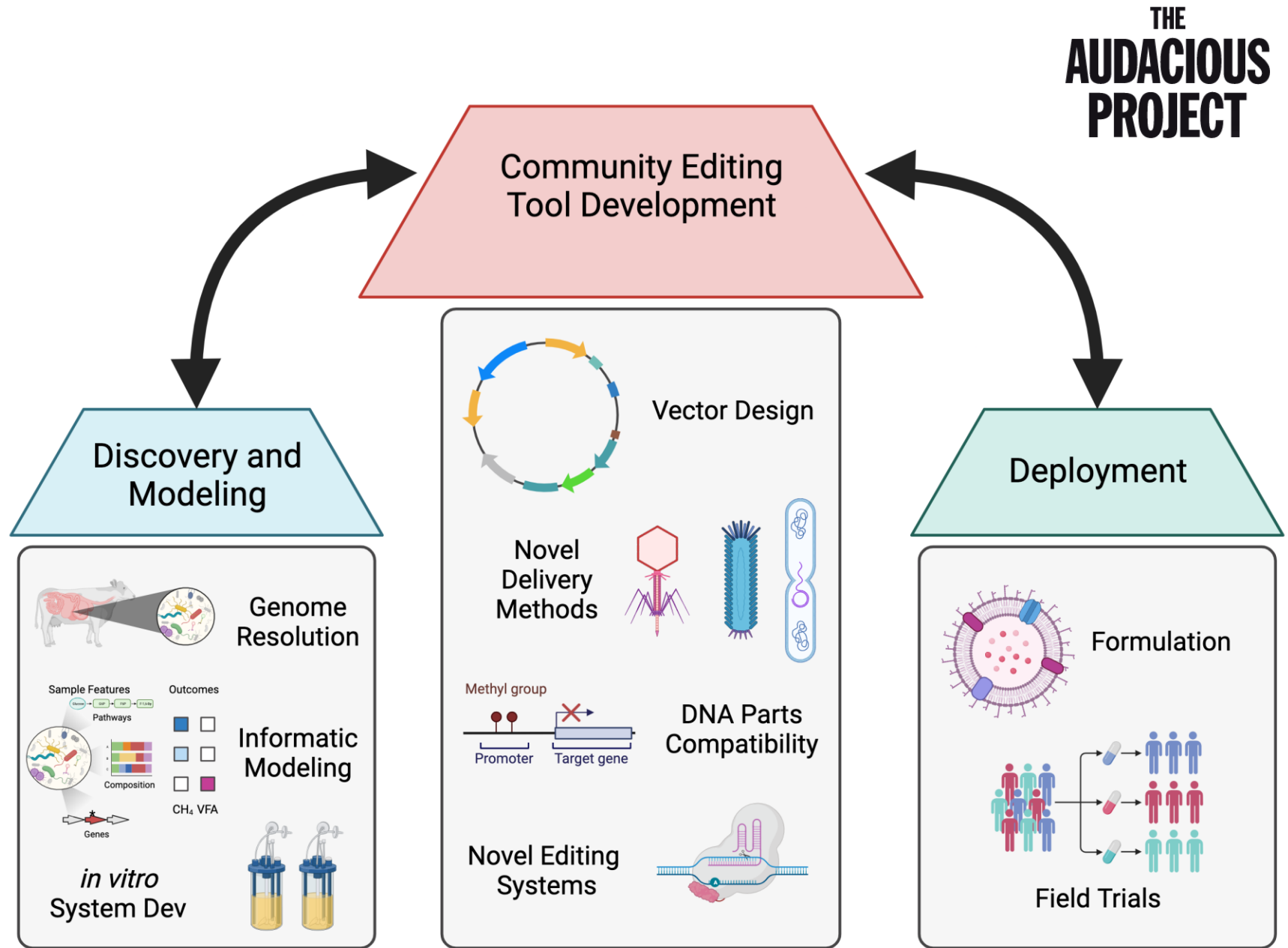


- A 7-year, \$70M multi-institutional project lead by Jennifer Doudna and Jill Banfield
- **Primary Goal:** Develop and implement precision genome editing approaches within real microbial communities that lead to measurable microbiome impacts.
- **Target Areas:**
  - **Human early life microbiome** impacts on childhood asthma and inflammation (partnership with UCSF)
  - **Bovine rumen microbiome** impacts on animal health and methanogenesis (partnership with UCD)



# Audacious Project Structure and Major Focus Areas

- The **primary** goal of Audacious Project is to develop and effectively implement community editing tools.
- We chose to work with microbiomes (gut and rumen) that have real-world impacts.
- Success is contingent on developing, applying, and deploying an editing solution for a real-world problem.



# IGI Audacious Team



## Technology Development Application to Emissions & Disease



Spencer Diamond



Sue Lynch



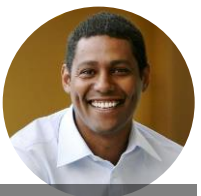
Niren Murthy



Carlotta Ronda



Niren Murthy



Ermias Kebreab



Melinda Kliegman



Matthias Hess



Rohan Sachdeva



Ben Rubin



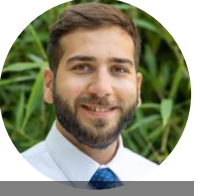
Spencer Diamond



Brady Cress



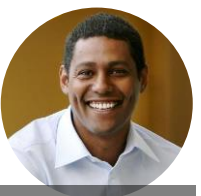
Sue Lynch



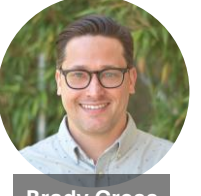
Manar Zaghlula



Carlotta Ronda



Ermias Kebreab



Brady Cress



Matthias Hess



Ben Rubin

**Program Management**

Audrey Glynn

Rachel Evans

**Leadership**

Jennifer Doudna

Jill Banfield

Brad Ringeisen