IAS 2021

Engineering B cells to produce protective antibodies

Session: What is coming next for *in vivo* gene therapy?

Justin J. Taylor PhD

Associate Professor

Immunology and Vaccine Development Program

Vaccine and Infectious Disease Division

FRED HUTCH

CURES START HERE®

IAS 2021
18 – 21 July

Summary FOR COMMUNITY

- **Key question:**

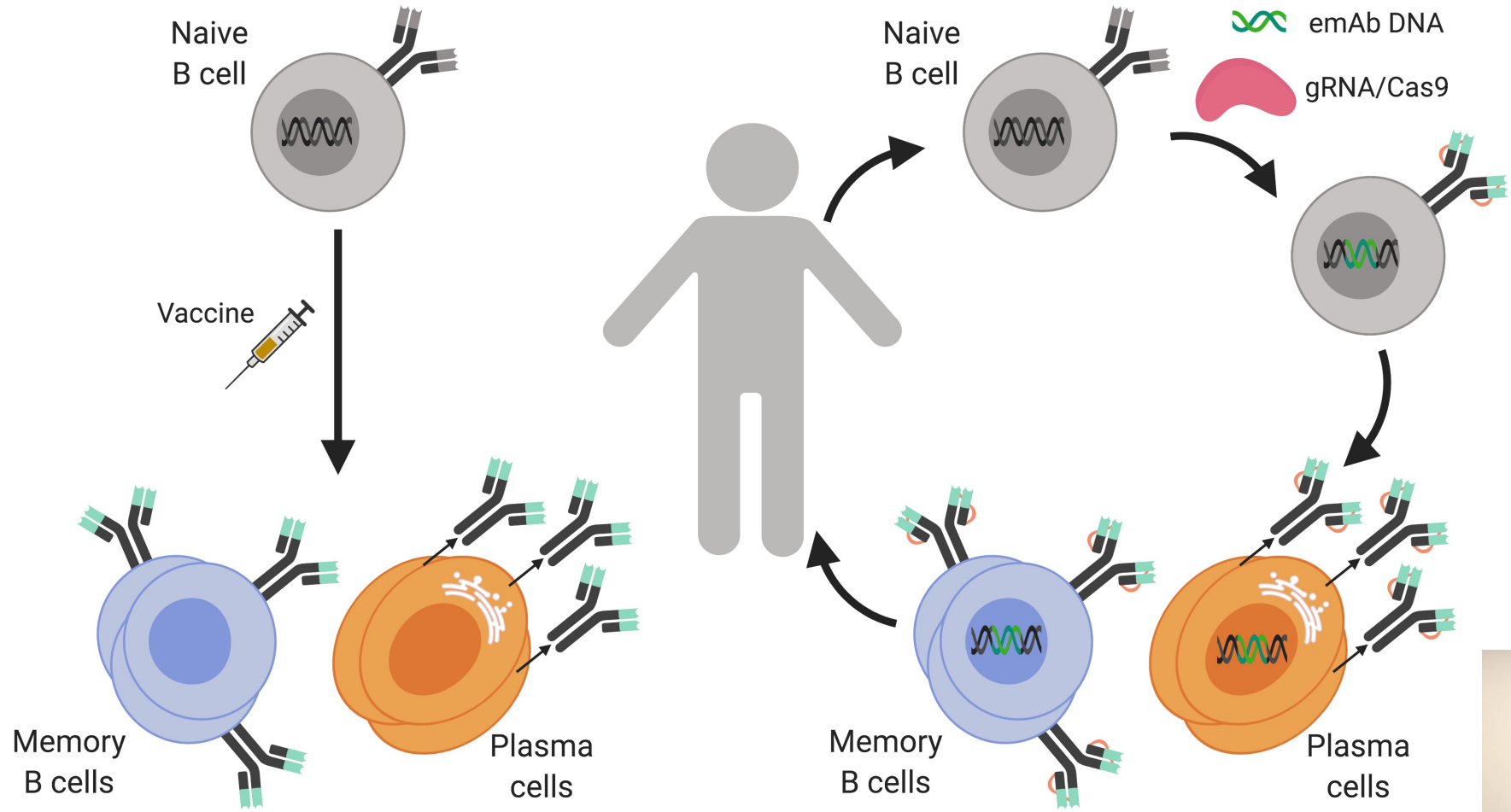
  Can we replace non-protective antibodies in immune cells with antibodies protective against HIV?

- **Why is this important and related to cure?**

  Engineered immune cells could represent a *single injection* that would provide a life-long source of antibodies able to control HIV.

IAS 2021
18 – 21 July

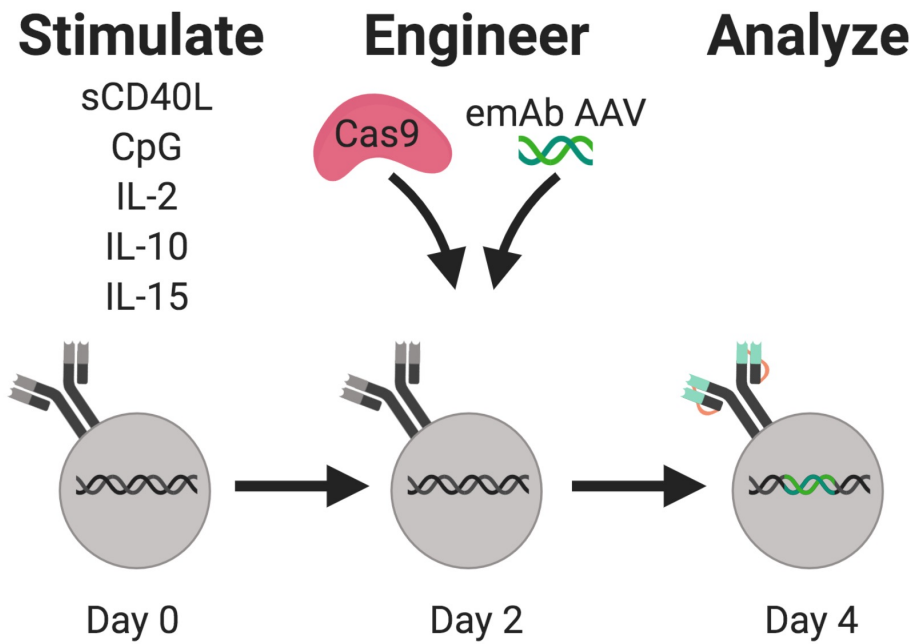
Engineering to mimic a protective antibody response



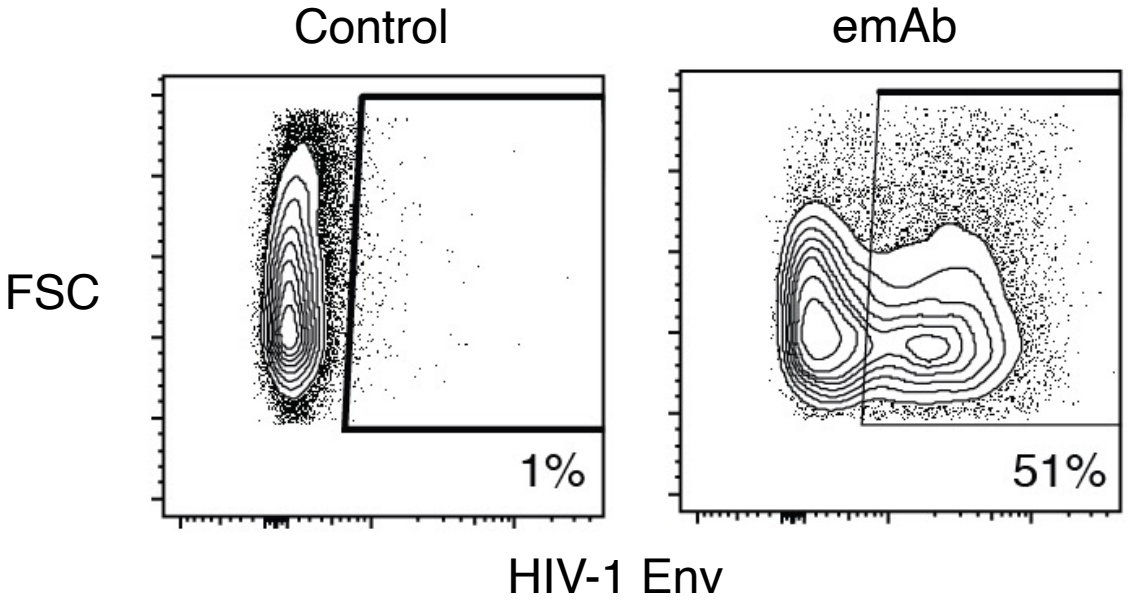
Created using BioRender.com

IAS 2021
18 – 21 July

Results: Highly efficient engineering of human B cells



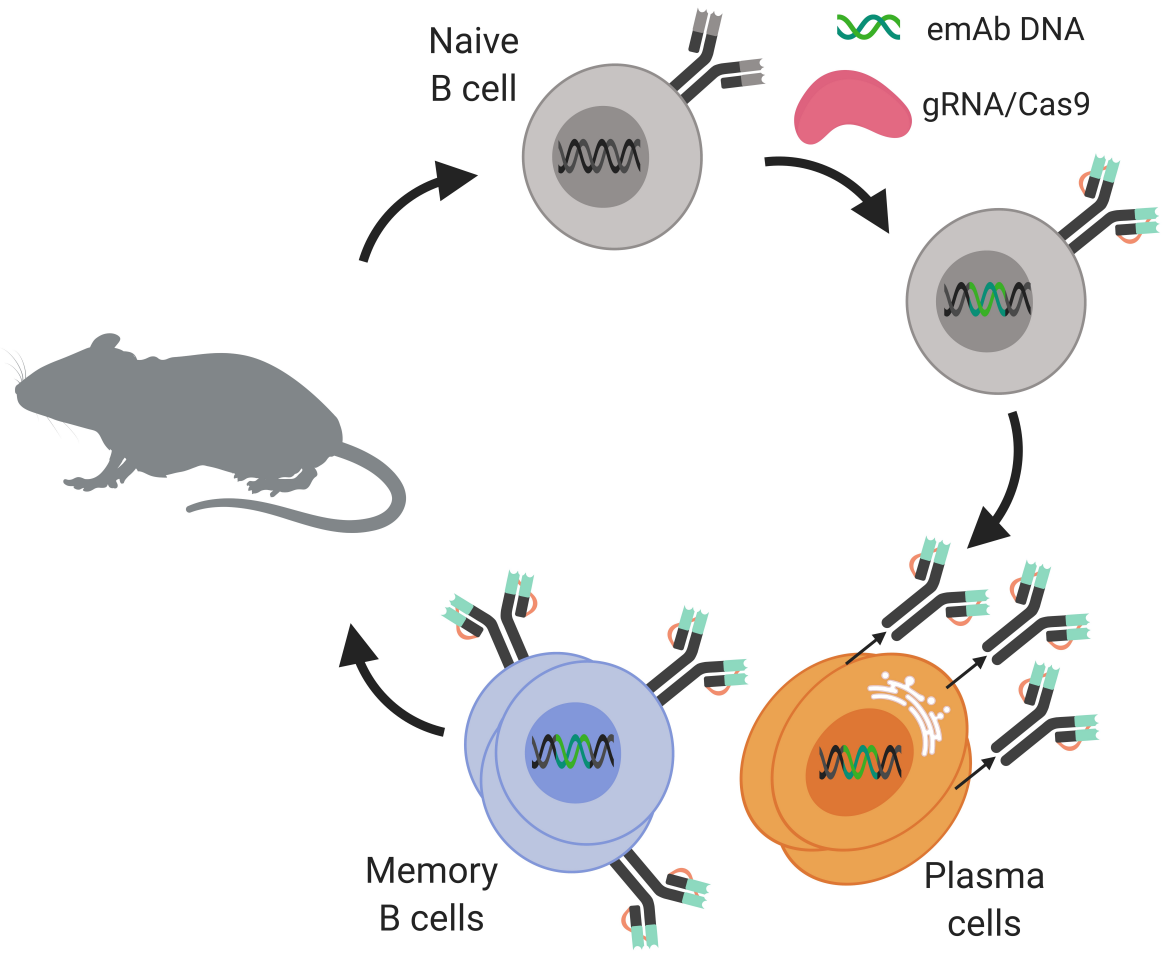
Created using BioRender.com



Howell Moffett PhD
Carson Harms MS
Marti Tooley

IAS 2021
18 – 21 July

Results: Engineered mouse B cells can protect against a viral infection



Created using BioRender.com

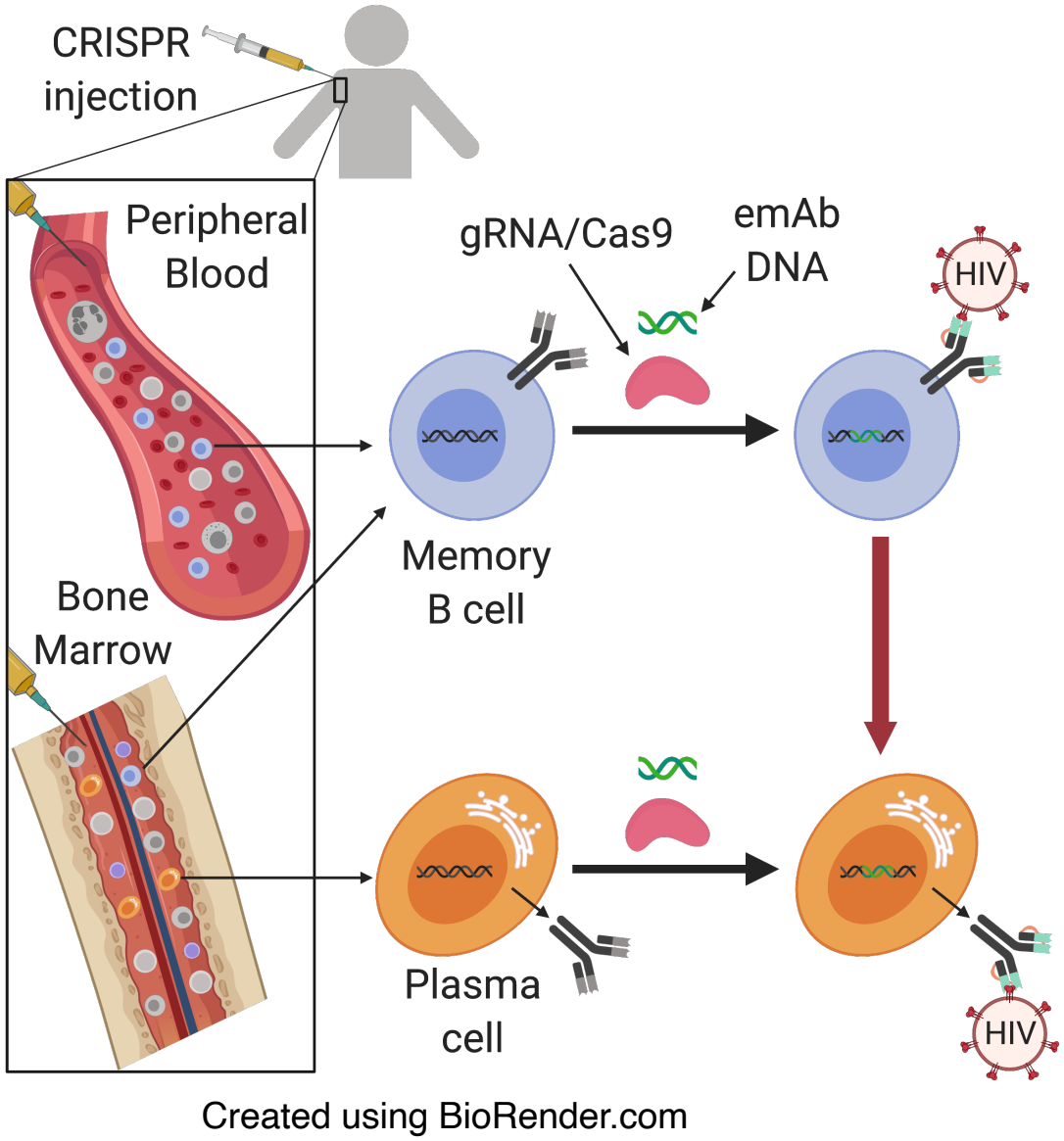
SCIENCE IMMUNOLOGY | RESEARCH ARTICLE 2019

B cells engineered to express pathogen-specific antibodies protect against infection

Howell F. Moffett[1], Carson K. Harms[1], Kristin S. Fitzpatrick[1], Marti R. Tooley[1], Jim Boonyaratanakornkit[1], Justin J. Taylor[1,2,3]*

IAS 2021
18 – 21 July

Long-term goal: *In vivo* engineering



Created using BioRender.com

Key Properties

Efficiency and durability

Multiple Antibodies

Safety: Off-target & mispairing

IAS 2021 18–21 July

Disclosures and Acknowledgements

TAYLOR LAB

HELP WANTED

jtaylor3@fredhutch.org
@JustinTaylorLab

FRED HUTCH
CURES START HERE®

Engineering Team

Jim Boonyaratanakornkit MD PhD
Kristin Fitzpatrick (UW PhD Student)
Jessica Schembri MS
Matt Gray PhD
Molly Kanagy
Kay Hopwo
Julia Luna McKechnie PhD

Former
Howell Moffett PhD (Outpace Bio)
Carson Harms MS (Lyell Immunopharma)
Marti Tooley (UW PhD Student)
Erica Naibert (Umoja Biopharma)

Key Collaborators

Jen Adair PhD & Lab
Hans-Peter Kiem MD PhD & Lab

VIR

THE HARTWELL FOUNDATION

NIH