Viral Vector Free Cellular Engineering

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@BLLPHD

TMUNITY™

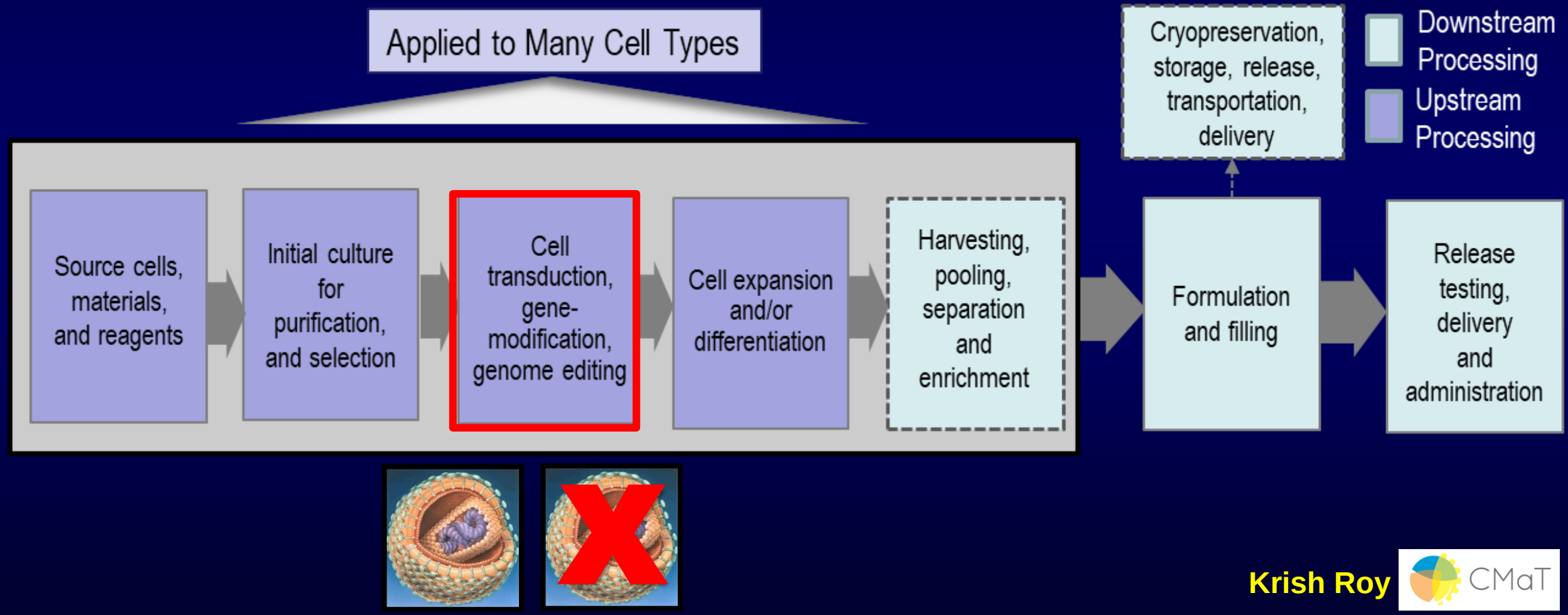
Penn
University of Pennsylvania

International Society
ISCT
Cell & Gene Therapy

Conflict of Interest Statement

- Declaration of financial interest due to intellectual property and patents in the field of cell and gene therapy.
- University of Pennsylvania Alliance with Novartis
- Consultant for Terumo
- Scientific Advisory Board for Akron, Avectas, Immuneel, Immusoft, In8bio, Ori Biotech, Vycellix
- Co-Founder and equity holder Tmunity Therapeutics
- Conflict of interest is managed in accordance with University of Pennsylvania policy and oversight

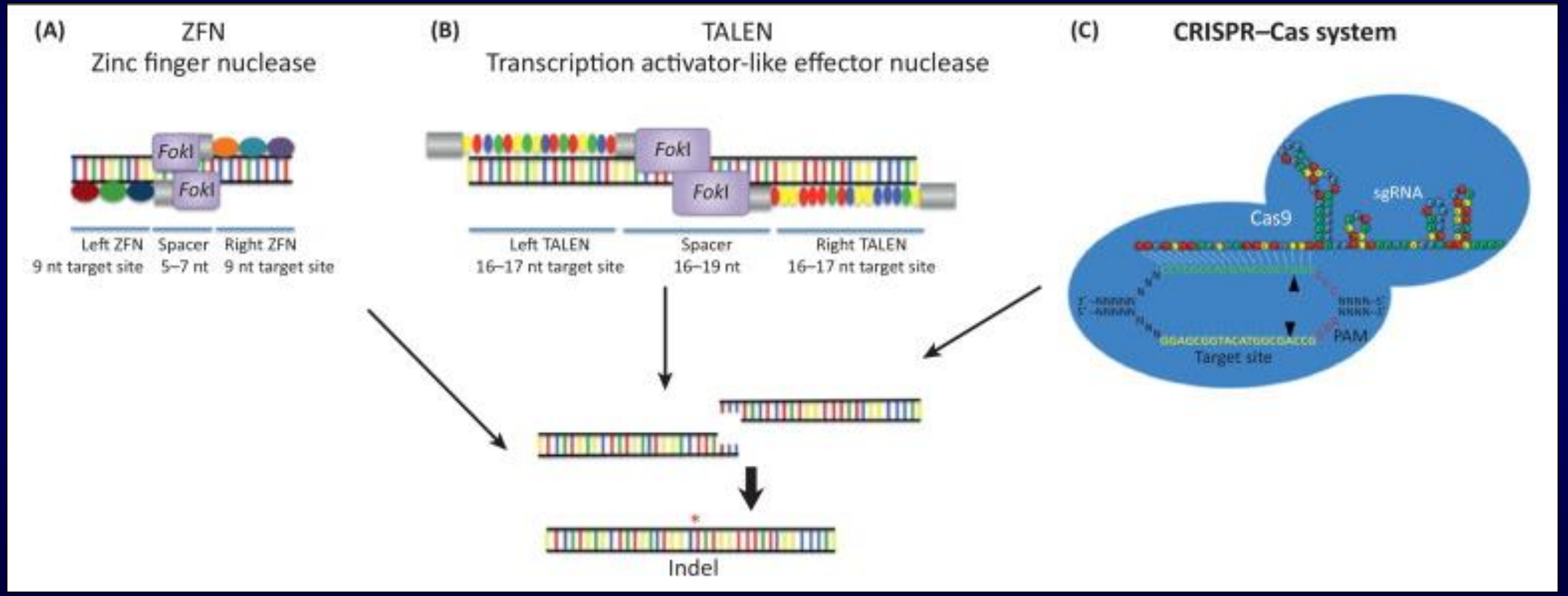
Engineered Immune Cell Ex Vivo Processing Flow



Krish Roy

CMaT

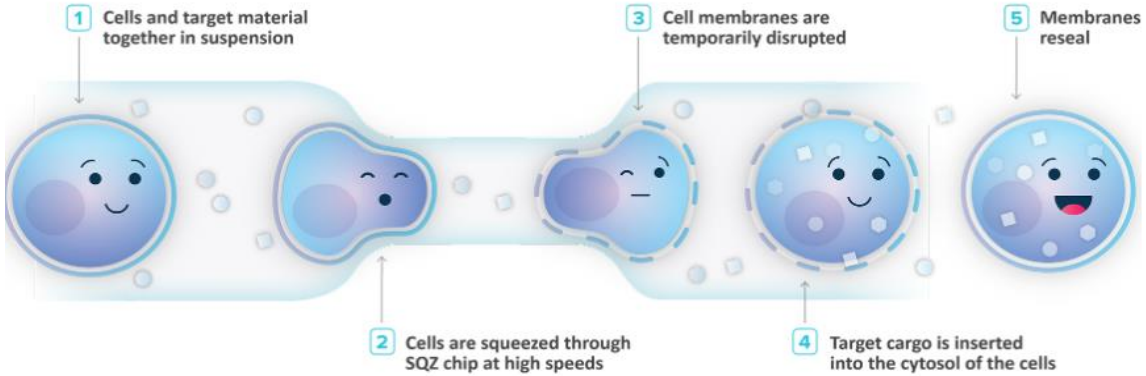
Genomic disruption (and insertion) as therapeutic cell engineering tools

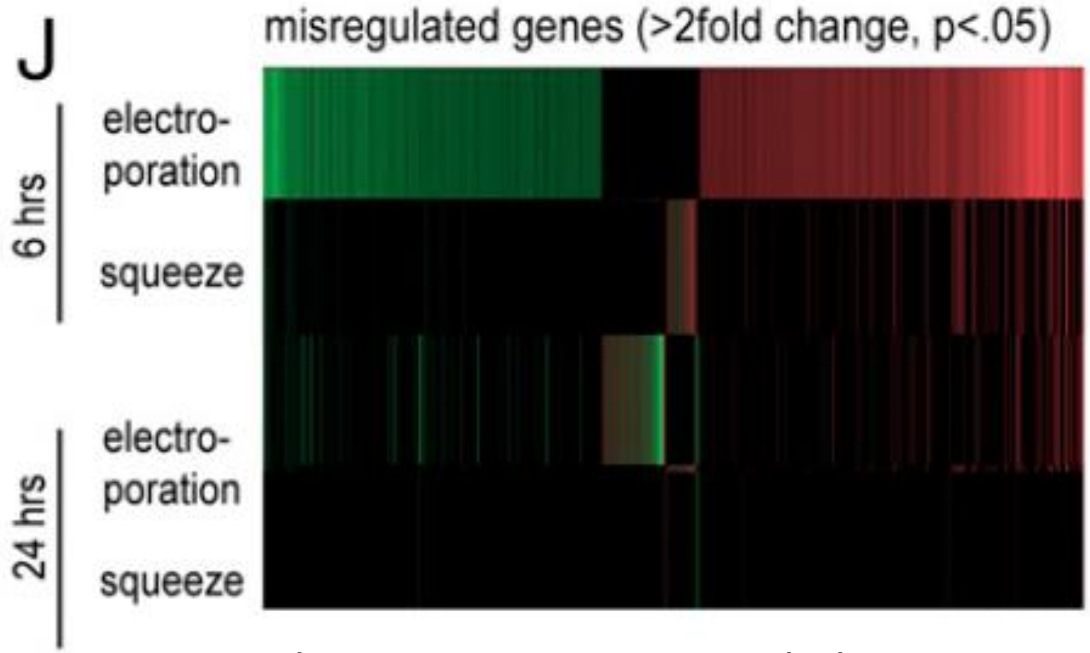


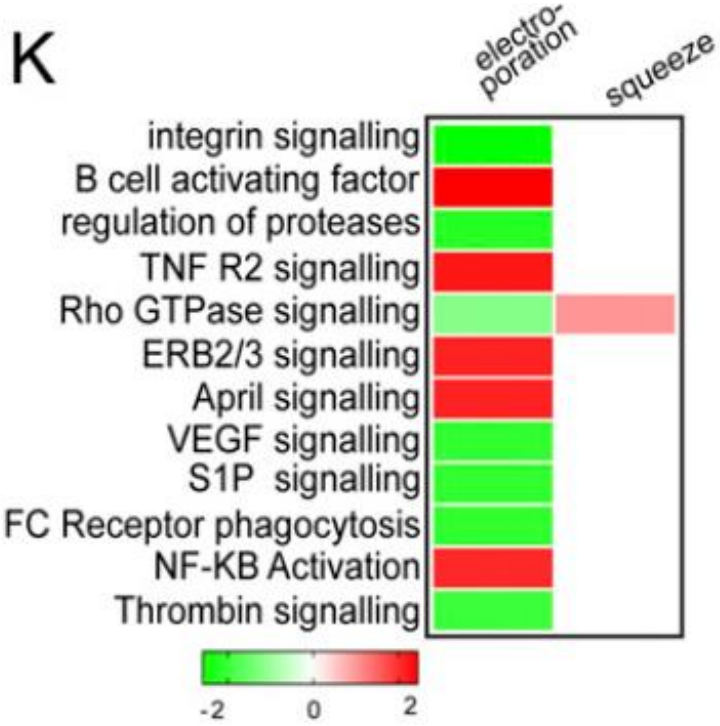
Trends in Neurosciences 2014 37, 106-123DOI: (10.1016/j.tins.2013.11.001)

Mechanical Poration

SQZ, MIT spinout

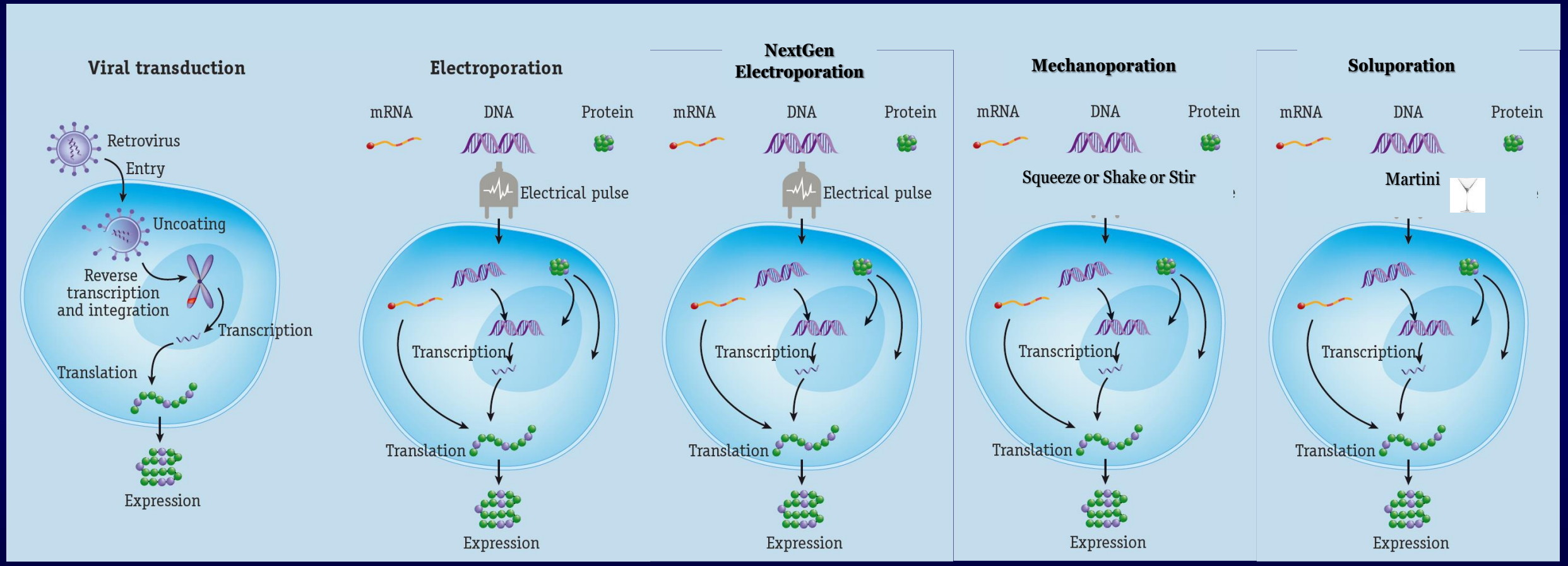






DiTommaso T, et al. PNAS 2018 Nov 13;115(46):E10907-E10914

Cellular Door Dash: Gene/Cargo Delivery

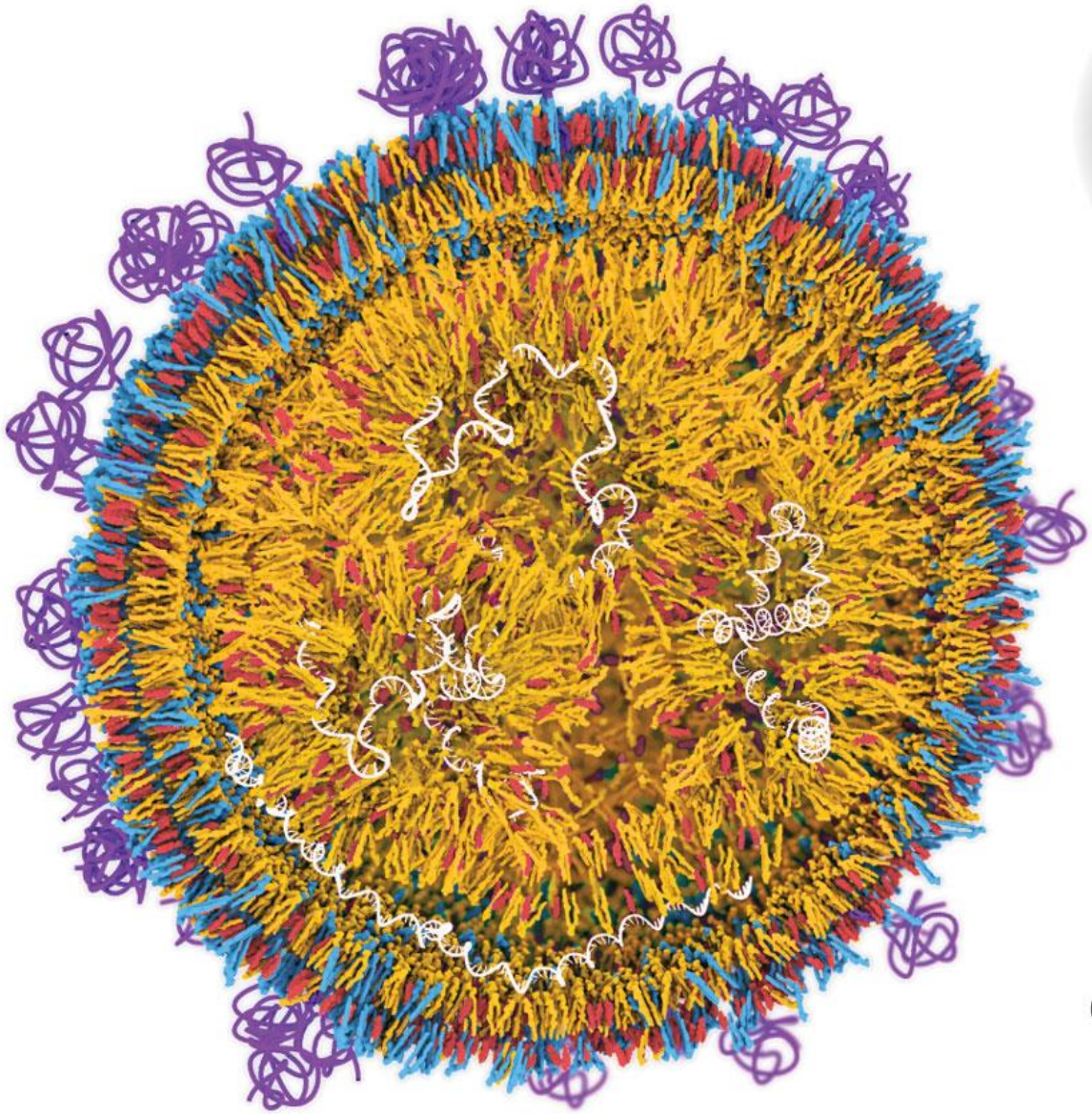


MIT
Kytopen

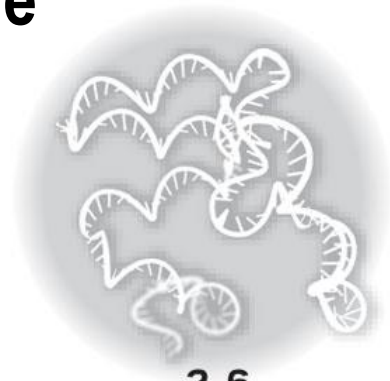
Georgia Tech
CellFE

Maynooth Univ.
Avectas

Vector free technology of the year/decade



Lipid nanoparticle, 80 nm wide



2-6
mRNA strands

1,000
PEG lipids

6,000
Phospholipids

20,000
Cholesterol molecules

30,000
Ionizable lipids

Credit: Moderna/C&EN

Electro-Mechanical Transfection

Cullen R. Buie, PhD | Massachusetts Institute of Technology

Transient Cell Volume Exchange

Todd Sulchek, PhD | Georgia Institute of Technology

Enabling the Next Wave of Non-Viral Cell Therapies

Michael Maguire, PhD, CEO | Avectas