On the call today

Joseph E. Payne, MSc
President & CEO

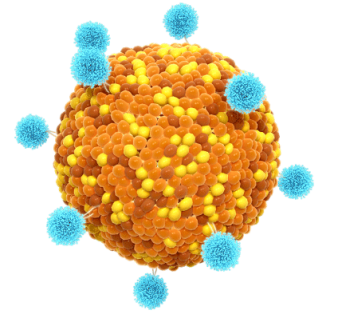
Pad Chivukula, Ph.D.
CSO & COO

Andrew Sassine, MBA
CFO

Steve Hughes, M.D.
Chief Development Officer

Ooi Eng Eong, BMBS, FRCPath, Ph.D.
Professor of the Emerging Infectious Diseases Programme at the Duke-NUS Medical School

Thank you for joining us during the Holiday Season



FORWARD LOOKING STATEMENTS

This presentation contains forward-looking statements. These statements relate to future events and involve known and unknown risks, uncertainties and other factors which may cause our actual results, performance or achievements to be materially different from any future performances or achievements expressed or implied by the forward-looking statements. Each of these statements is based only on current information, assumptions and expectations that are inherently subject to change and involve a number of risks and uncertainties. Forward-looking statements include, but are not limited to, statements about: the likelihood that preclinical or clinical results will be predictive of future clinical results or sufficient for regulatory approval; the likelihood of the Company to obtain clearance from regulatory authorities to proceed with planned clinical trials; the planned initiation, design or completion of clinical trials; the likelihood of success, or of the efficacy or safety, of the Company's COVID-19 vaccine candidate or other product candidates; potential treatment regimens of the Company's COVID-19 vaccine candidate; the ability to initiate or complete preclinical and clinical development programs, including as a result of the COVID-19 pandemic; the impact of commercialization of third-party COVID-19 vaccines on the design and enrollment in clinical trials; general market conditions that may prevent such achievements or performance; and any statements other than statements of historical fact, including those related to Arcturus' future cash, market or financial position.

In some cases, you can identify forward-looking statements by terms such as "may," "will," "should," "could," "would," "expects," "plans," "anticipates," "believes," "estimates," "projects," "predicts," "potential" and similar expressions (including the negative thereof) intended to identify forward looking statements. Arcturus may not actually achieve the plans, carry out the intentions or meet the expectations or projections disclosed in any forward-looking statements such as the foregoing, and you should not place undue reliance on such forward-looking statements. The forward-looking statements contained or implied in this presentation are subject to other risks and uncertainties, including those discussed under the heading "Risk Factors" in Arcturus' Annual Report on Form 10-K for the fiscal year ended December 31, 2019, filed with the SEC on March 16, 2020 and in subsequent filings with, or submissions to, the SEC. Except as otherwise required by law, we disclaim any intention or obligation to update or revise any forward-looking statements, which speak only as of the date they were made, whether as a result of new information, future events or circumstances or otherwise.

ARCT-021 Continues to Progress

Arcturus COVID-19 vaccine candidate continues to progress
Meaningfully different: utilizing STARR™ self-amplifying mRNA & LUNAR® delivery technology

Approved by the Singapore Health Sciences Authority (HSA) to proceed with a Phase 2 clinical study in 600 subjects

- Supported by comprehensive clinical and scientific data
- Phase 1/2 data & extensive preclinical studies

ARCT-021 may result in a highly effective vaccine with a differentiated product profile

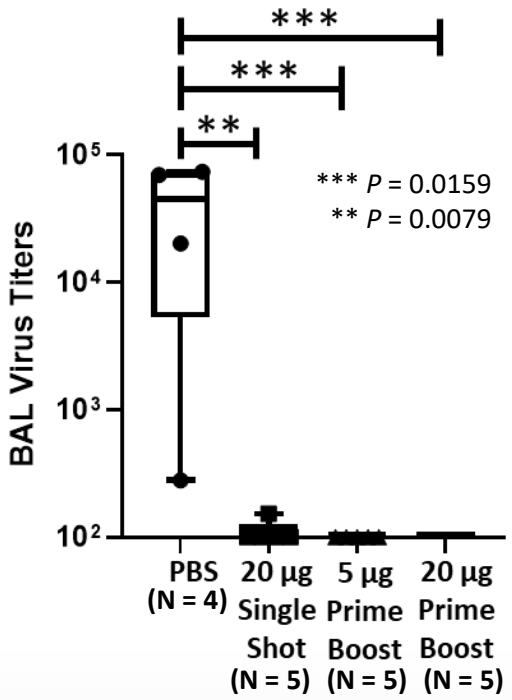
- may be effective as a low single dose mRNA vaccine
- compliance and logistical distribution benefits
- many areas of the world require a single dose regimen

Timeline

- Intend to start Phase 2 study soon
- IND application submitted to U.S. FDA; response anticipated soon
- Interim Phase 2 data in early 2021 to select a final dose and regimen for Phase 3 registrational study
- Targeting start of Phase 3 registrational study in Q2 2021

On today's call, Dr. Steve Hughes and Professor Ooi Eng Eong will provide a more detailed review of our data …

ARCT-021 Vaccination Significantly Effective in Primate (Macaque) Challenge Model



7 Days After SARS-CoV-2 Virus Challenge –

- Geometric mean lung viral titers exceeded 1.31 x 10^4 in non-vaccinated primates (PBS)
- Lung viral titers are between 3.30 and 3.81 log **lower** in vaccinated primates

Both single administration and prime-boost regimens of ARCT-021 are significantly effective
Vaccinated macaques show substantial reductions in lung viral titers (Geomean < 10)

Interim Phase 1/2 Results

Steve Hughes, M.D.

Chief Development Officer

Study Overview

- Testing single doses and prime-boost regimens
- Younger (≤55 yr) and older (>55 yr) adults
  - The single doses tested are 1, 5, 7.5 and 10 µg
    - 7.5 µg in older and younger adults
  - Two dose cohorts tested 3 ug and 5 ug in both older and younger adults
- Fully enrolled with 106 participants
  - All participants have now received all doses
  - 78 active vaccine; 48 received 2 doses.
  - No data yet available for 3 µg prime boost cohorts

Safety

Well tolerated at selected doses

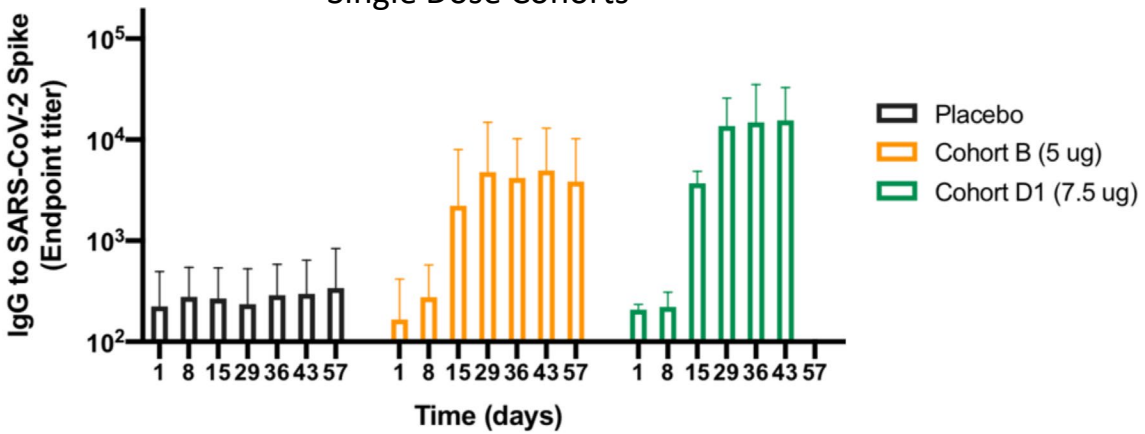
- No safety concerns identified
- No participants have withdrawn from the study; all participants completed all doses
- All adverse events except 2 were mild or moderate at doses selected for Phase 2
  - Transient Grade 3 fatigue and myalgia observed following second injection in one older adult.
  - Transient, asymptomatic Grade 3 lymphopenia seen in one participant.
    - Lymphopenia has been observed with other RNA vaccines.
- Only serious adverse event (SAE) was in a placebo participant

Immunogenicity

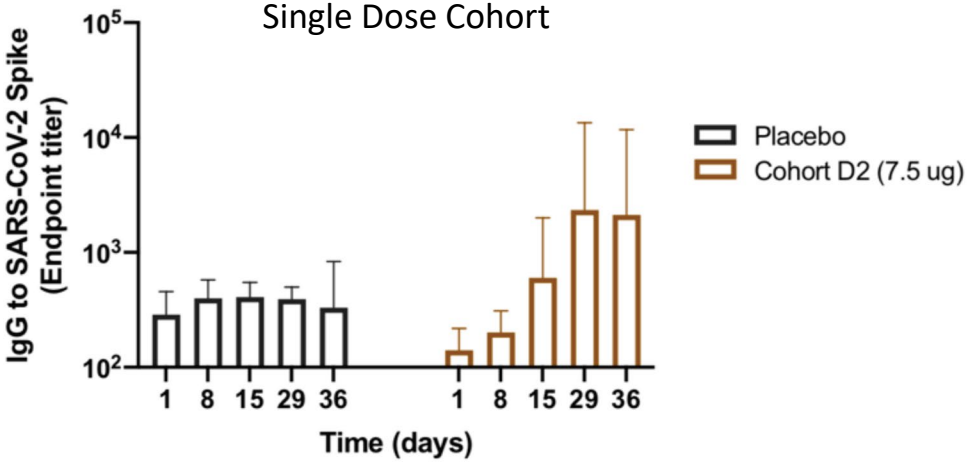
IgG Binding Antibodies

Luminex (GMT ± SD)

Younger Adult (≤55 yr) 5µg and 7.5 µg
Single Dose Cohorts

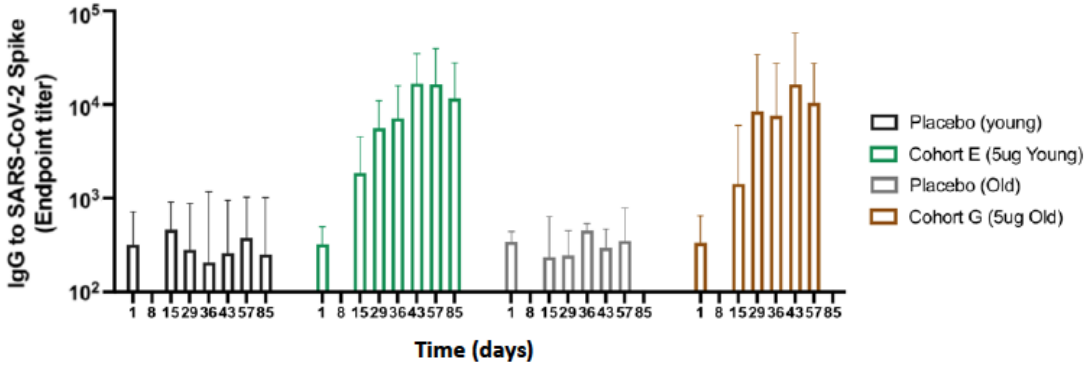


Older Adult (>55 yr) 7.5 µg
Single Dose Cohort



Younger Adult 5 µg
Prime-Boost Cohort

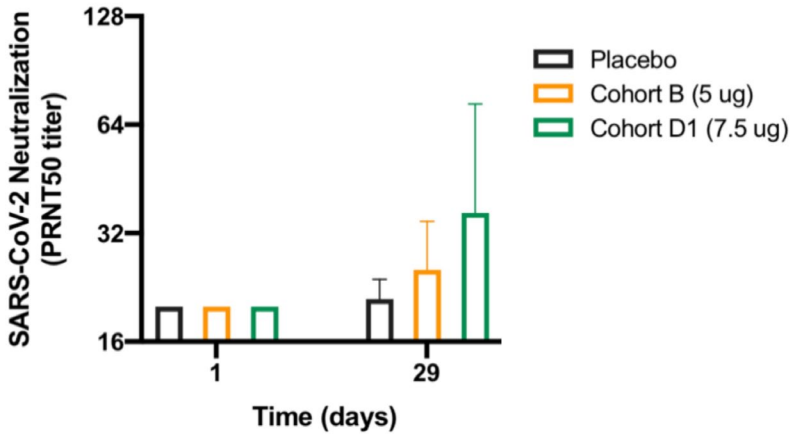
Older Adult 5 µg
Prime-Boost Cohort



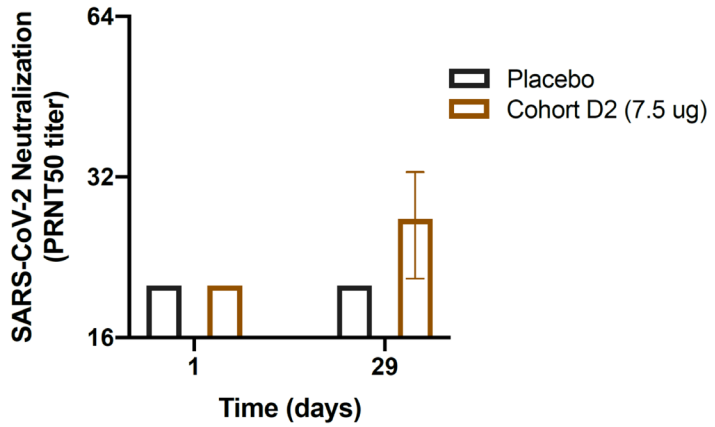
Neutralizing Antibodies

PRNT50 (GMT ± SD)

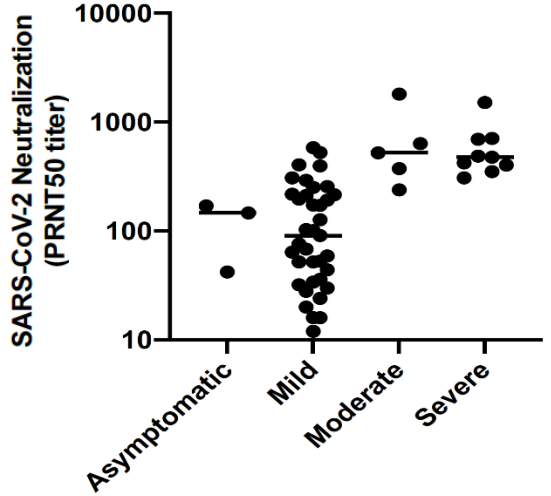
Younger Adult (≤55 yr) 5µg and 7.5 µg Single Dose Cohorts



Older Adult (>55 yr) 7.5 µg Single Dose Cohort

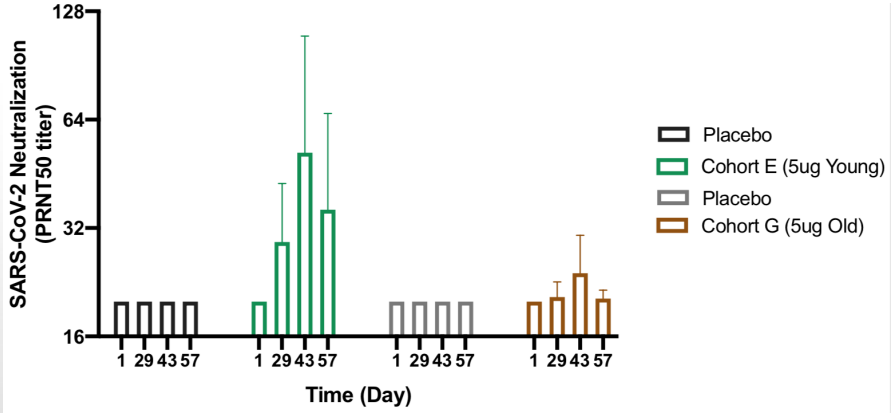


Convalescent COVID-19 Serum



Younger Adult 5 µg Prime-Boost Cohort

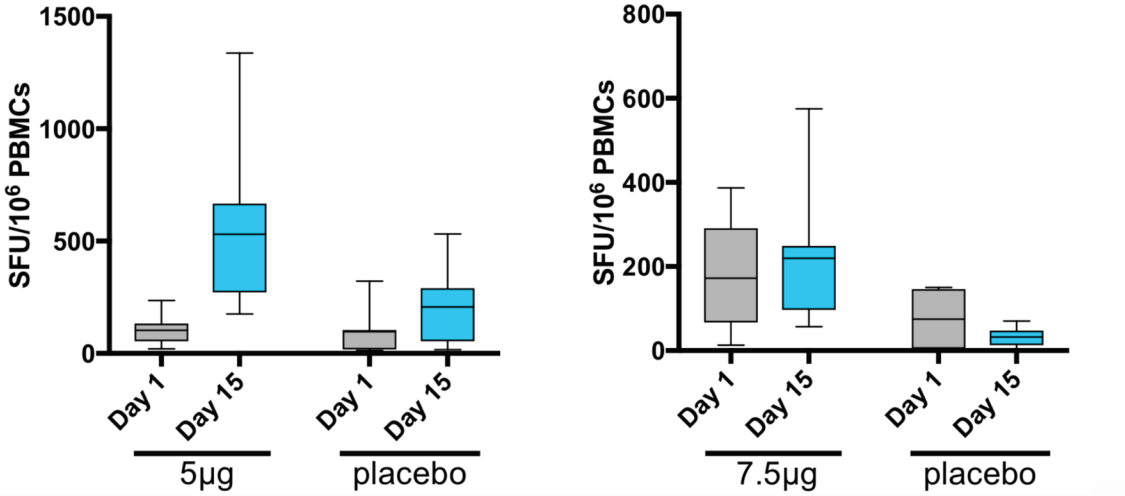
Older Adult 5 µg Prime-Boost Cohort



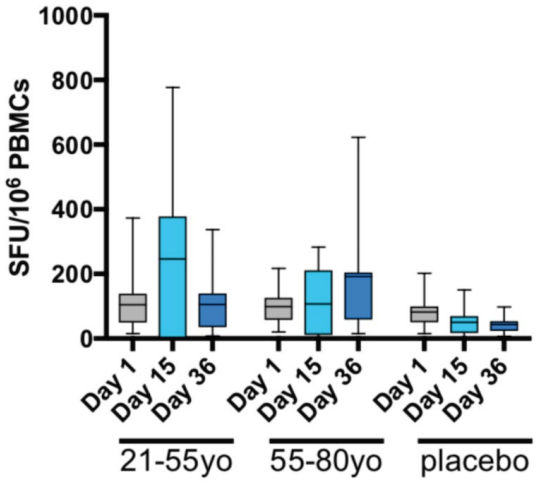
T-cell Responses Detectable by Day 15

ELISpot (mean and range)

Single Dose Cohorts (5µg and 7.5µg†)



Prime-Boost Cohorts (5µg)

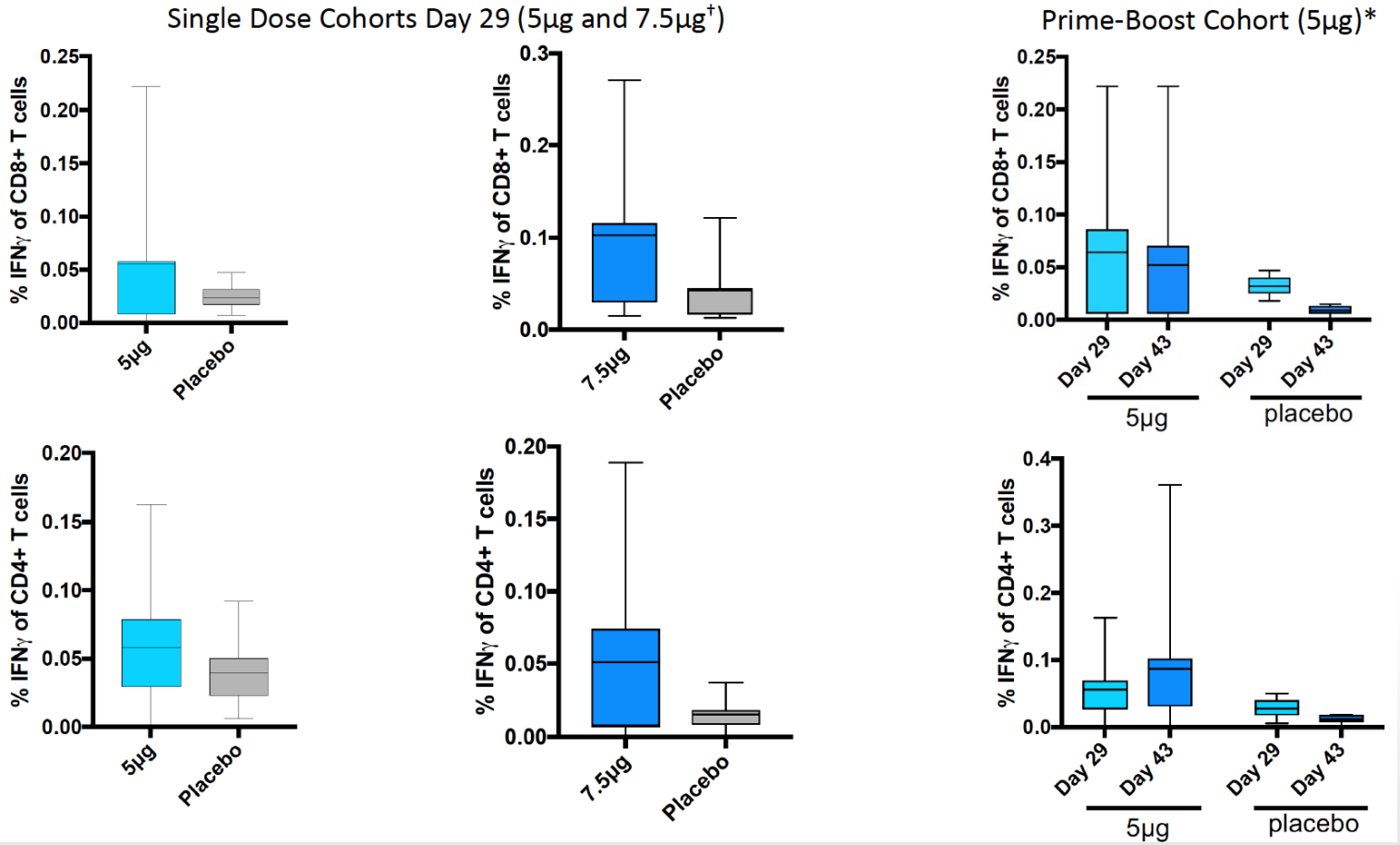


†Older and younger adults pooled

PBMC stimulated with peptide pools spanning full length of SARS-CoV-2 spike protein and IFNγ positive cells assessed by ELISpot

CD8+ and CD4+ Responses Detected

Cytokine staining (mean and range)



*Older adult prime-boost data not yet available
†Older and younger adults pooled

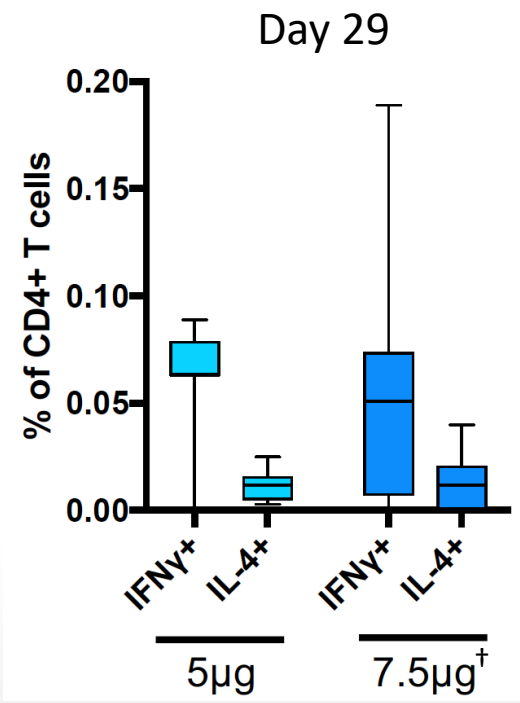
PBMC stimulated with peptide pools spanning full length of SARS-CoV-2 spike protein and cytokine expression assessed by flow cytometry

Th1 Dominant CD4+ Response

Cytokine staining (mean and range)

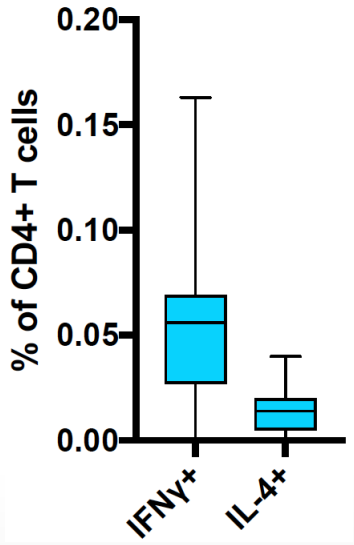
Single Dose Cohorts

Day 29

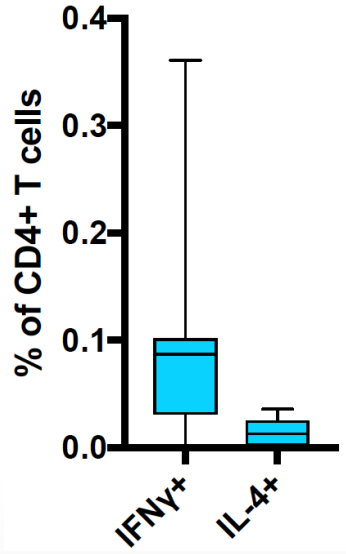


Prime-Boost Cohort (5µg)*

Day 29



Day 43



*Older adult prime-boost data not yet available

†Older and younger adults pooled

PBMC stimulated with peptide pools spanning full length of SARS-CoV-2 spike protein and IFNγ positive cells (TH1) and IL-4 positive cells (Th2) detected by flow cytometry

Next Clinical Trials

Continued Late-Stage Clinical Development

- Phase 2 Study in Singapore and USA
  - Approved in Singapore; IND pending
  - 600 healthy participants - younger and older:
    - 50% ≤ 55 years, 50% >55 years, >25% ≥ 65 years
  - Will test 7.5µg single dose; 7.5 µg two doses; and 5 µg two doses vs placebo
  - Objective to select dose and schedule for Phase 3
  - Interim analyses at Day 28 and Day 56 to enable Phase 3 start
- Phase 3 Study to be conducted globally
  - Targeting Q2 2021 start
  - ≥15,000 participants (younger, older and risk groups represented)
  - Targeting interim analysis for EUA/Conditional Approval applications H2 2021

Partner in Academic Medicine

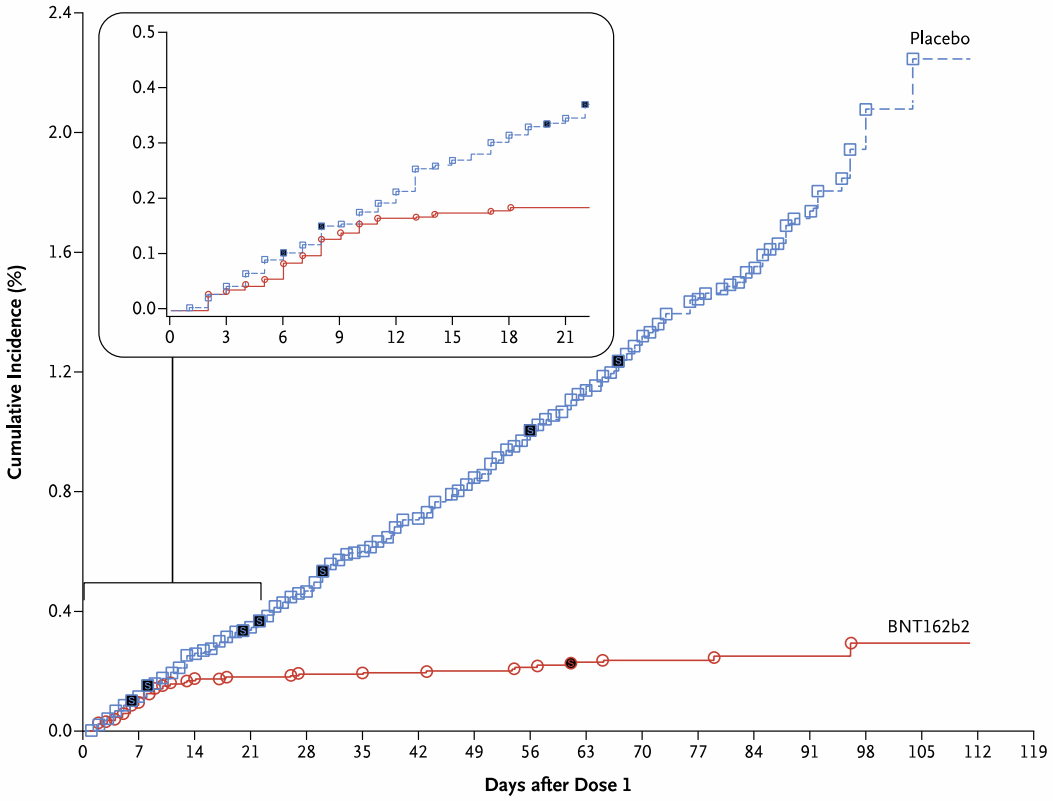
SingHealth

LUNAR-CoV19: Integrating the clinical and preclinical data

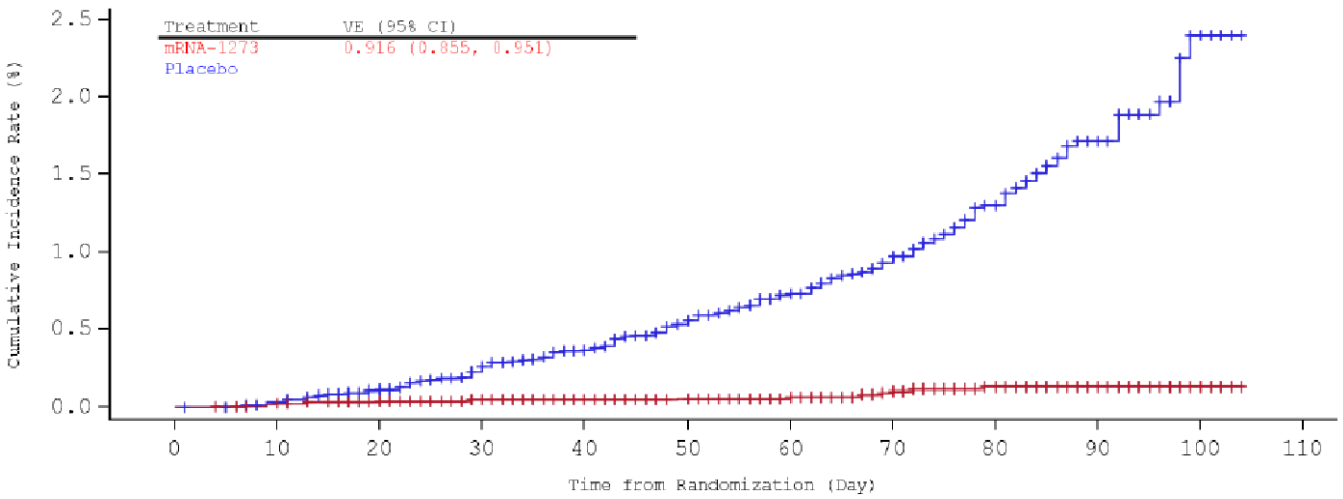
Eng Eong Ooi, BMBS PhD FRCPath
Professor
Program in Emerging Infectious Diseases
Duke-NUS Medical School

BNT162bc and mRNA1273 show efficacy ~2 weeks after 1st dose

Pfizer/BNT



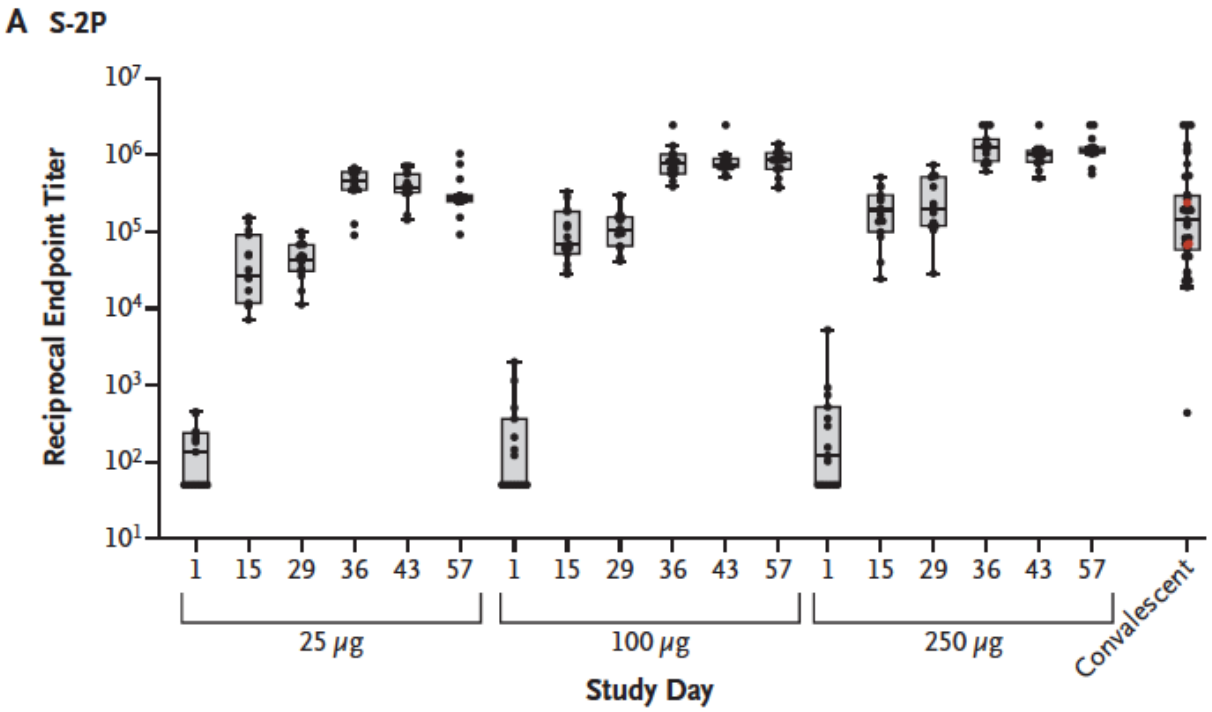
Moderna

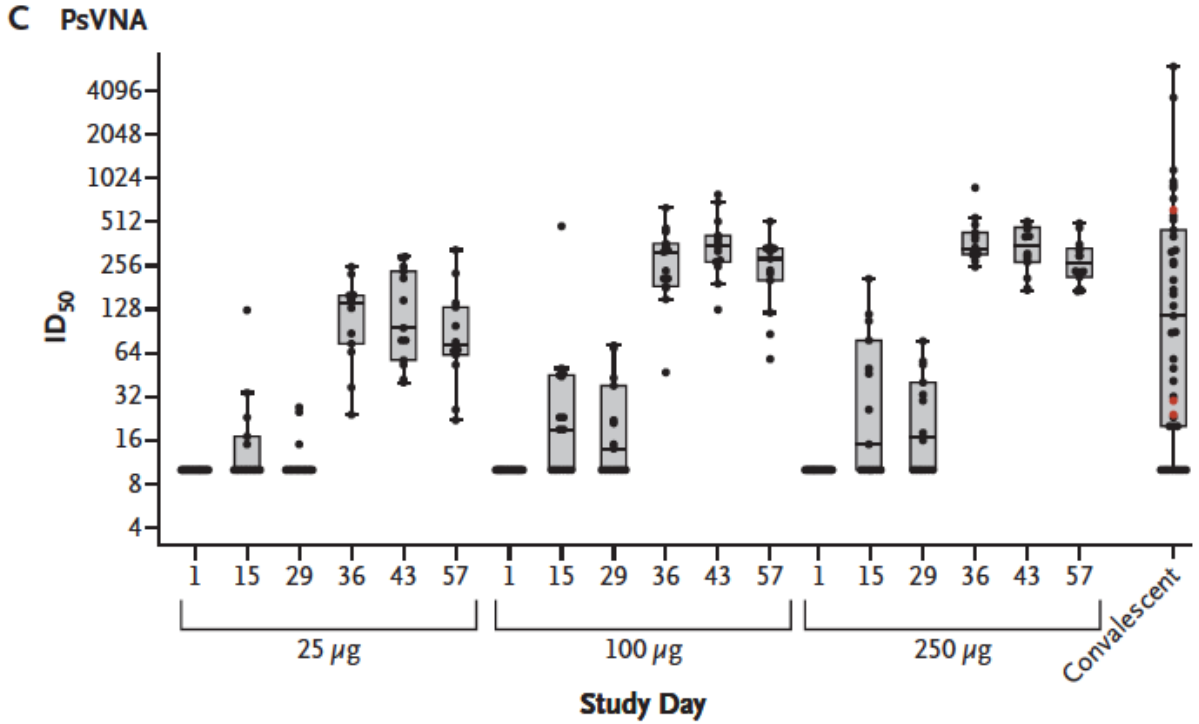


ModernaTX FDA Briefing Document

Polack et al, NEJM 2020

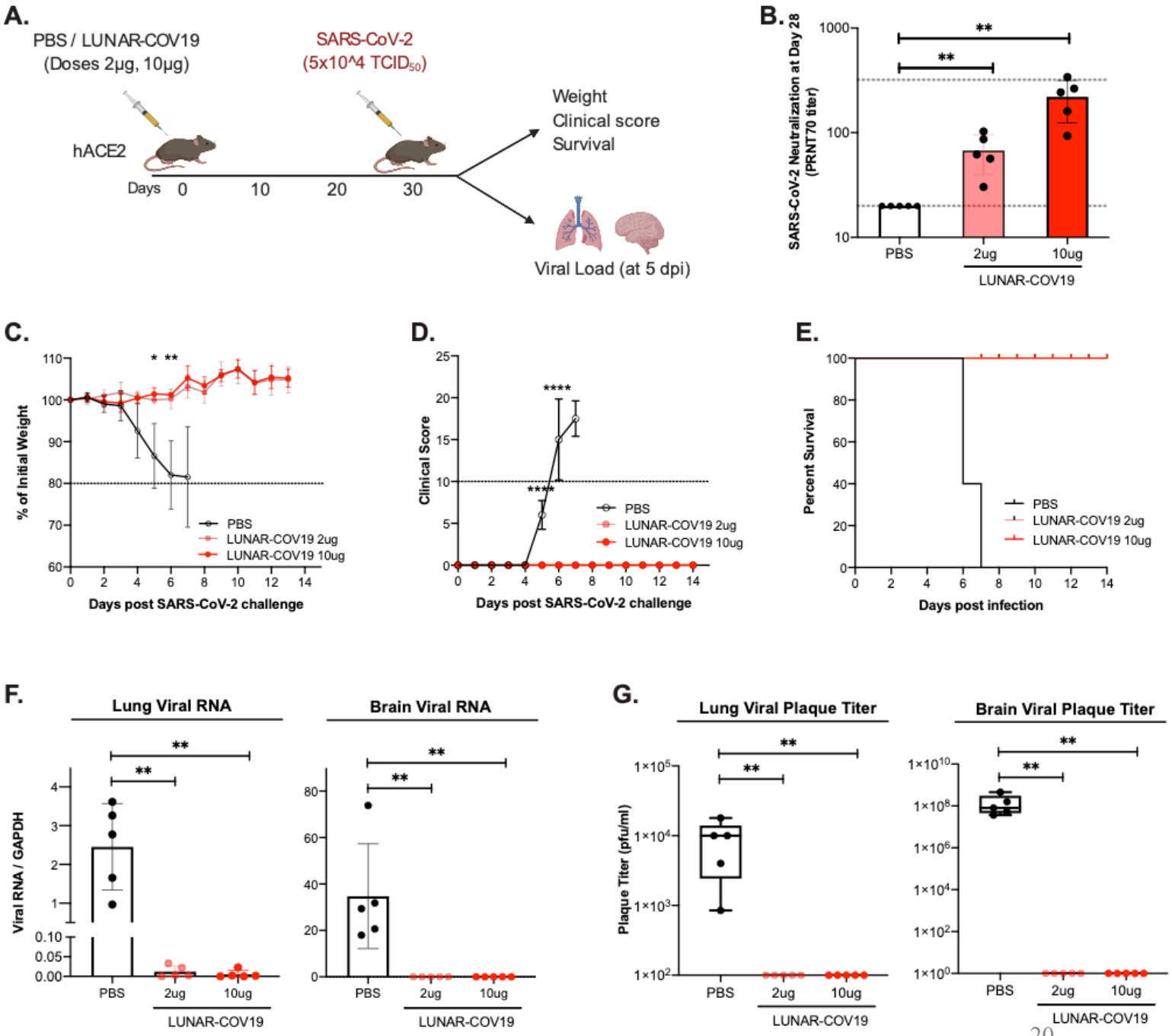
Immunogenicity of mRNA1273 vaccination





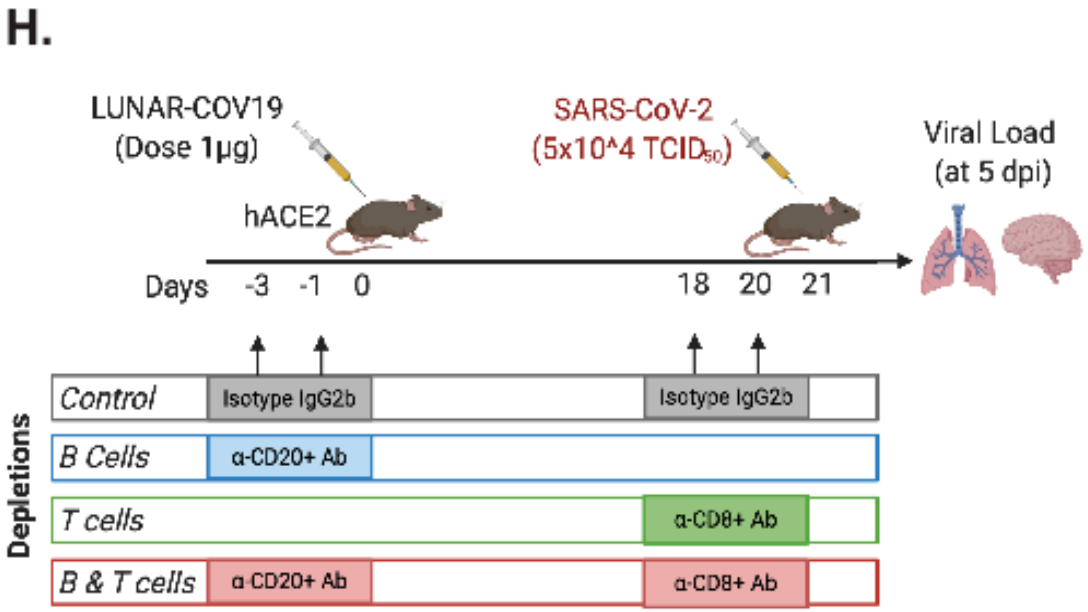
Jackson et al, NEJM 2020

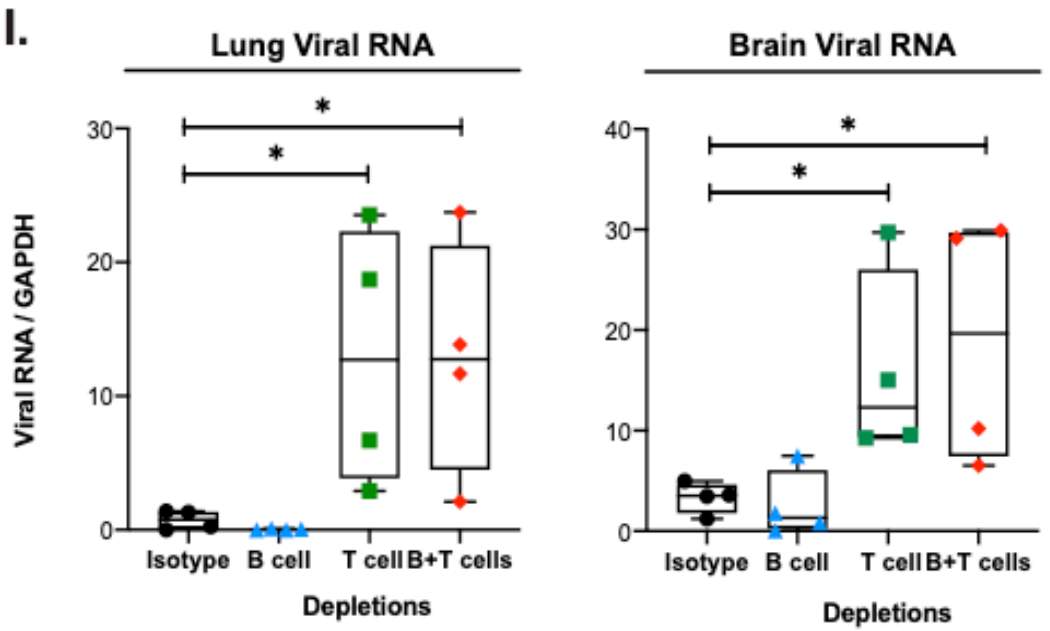
A single LUNAR-CoV19 vaccination protects hACE2 transgenic mice from lethal SARS-CoV-2 infection



de Alwis et al, manuscript under revision

CD8+ T cells play a critical role in preventing SARS-CoV-2 infection



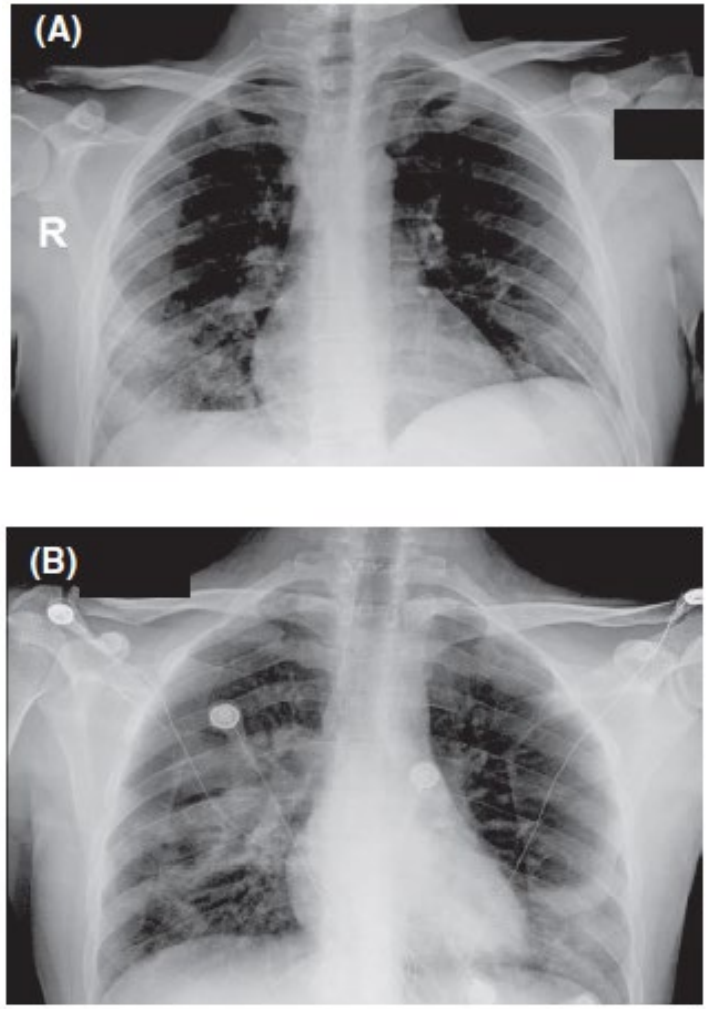


Esther Gan

COVID-19 patients recover without antibodies

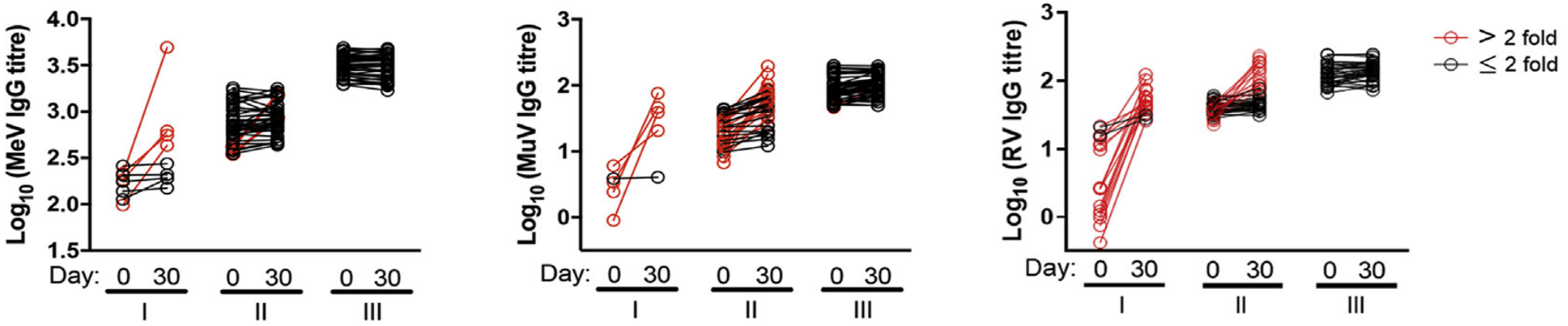
TABLE 2 Lymphocyte subsets of XLA patients

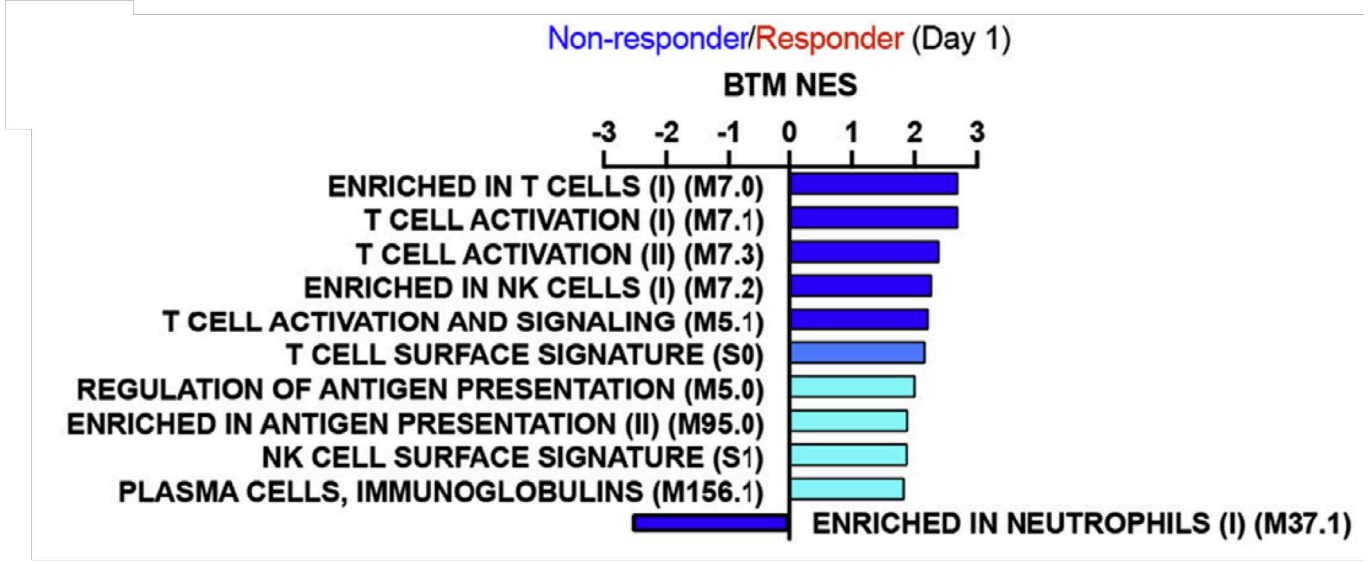
	Patient 1	Patient 2	Normal values
$CD3^+$ T lymphocytes (%)	88.4	94.7	(57.1-87.6)
$CD3^+$ (cells/μL)	1040	1791	(721-2562)
$CD4^+$ T cells (%)	42.1	44.9	(28.5-65.6)
CD4+ (cells/μL)	495	849	(273-1882)
CD8+ T cells (%)	43.3	30.6	(10.5-37.7)
CD8+ (cells/μL)	509	578	(177-783)
$\gamma\delta^+$ T cells (%)	3.8	32.4	(0.9-11.2)
B cells $CD19^+$ (%)	-	-	(5.8-22.1)
$CD19^+$ (cells/μL)	-	-	(86-684)
NK cells ($CD3^-CD56^+$. $CD3^-CD16^+$, %)	11.6	5.3	(3.4-28.4)



Soresina et al, Pediatr Allergy Immunol 2020

Early T cells protect against MMR re-infection





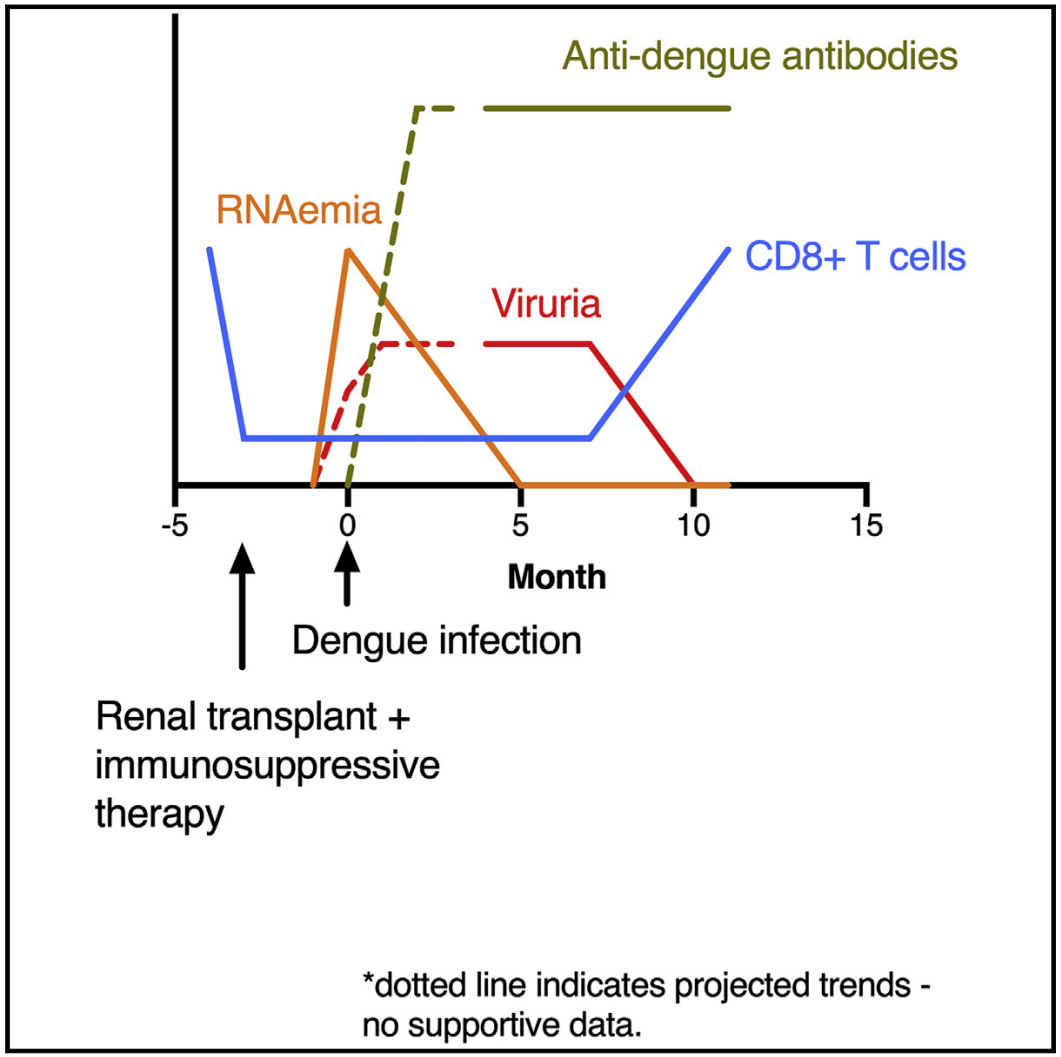
Ong et al, Antiviral Res 2019

Cell Host & Microbe
Brief Report

Persistent Dengue Infection in an Immunosuppressed Patient Reveals the Roles of Humoral and Cellular Immune Responses in Virus Clearance

Kar-Hui Ng,[1,2,9,*] Summer Lixin Zhang,[3] Hwee Cheng Tan,[3] Swee Sen Kwek,[3] October Michael Sessions,[3,4] Chang-Yien Chan,[1] Isaac Desheng Liu,[2] Chun Kiat Lee,[5] Paul Ananth Tambyah,[6] Eng Eong Ooi,[3,4,7,8] and Hui-Kim Yap[1,2,8]

Graphical Abstract



Summary

- Early protection (~12 days) after the 1st dose in both Pfizer/BioNTech's and Moderna's Covid vaccines provide a window into the correlates of protection
- A single dose LUNAR-CoV19 fully protected hACE2 mice from lethal SARS-CoV-2 challenge
- Depletion of CD8+ T cells but not B cells led to breakthrough SARS-CoV-2 infection
- Virus specific T cells is likely an important mediator of protection against Covid-19

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