

Today's Agenda

| Topic | Presenter(s) | Approximate Time |
|---|---|------------------|
| Welcome, Announcements, Introductions | Lachelle Smith, Director, ECHO Idaho | 5 minutes |
| Idaho Epidemiology Curves and Public Health Updates | Carolyn Buxton Bridges, MD FACP | 5 minutes |
| Public Health to Clinical Practice – Infection Control and Prevention Practices: PPE, UV light, Vaccination | Megan Dunay, MD MPH | 10 minutes |
| The Basic Science Aspects of COVID-19: Virology and Immunology | Ranya Miura, PhD | 15 minutes |
| Review of Clinical Pearls and Q&A | Sky Blue, MD Tanya Miura, PhD Cathy Oliphant, PharmD Andrea Christopher, MD MPH Megan Dunay, MD MPH | 20 minutes |
| Closing, Announcements, Call to Action | Megan Dunay, MD MPH Lachelle Smith, Director, ECHO Idaho | 5 minutes |

ECHO IDAHO



Microbiology of COVID-19 and the Infectious Disease Clinical Perspective

April 7, 2020

Sky Blue, MD

Tanya Miura, MD

Cathy Oliphant, PharmD

Carolyn Buxton Bridges, MD

Andrea Christopher, MD, MPH

Megan Dunay, MD, MPH

Idaho Public Health Updates

Carolyn Buxton Bridges, MD FACP

Governor's Coronavirus Working Group, Former CDC Public Health Physician and Researcher

COVID-19 in Idaho

*Data updated at 5:00 p.m. MT, 4/06/2020. State-level data will be updated at 5 p.m. MT daily, based on surveillance system records provided by the health districts. Public health district data will be updated on their agency website at their discretion and might differ from data presented here. **Data are preliminary and subject to change.**

1,170

Confirmed Cases

69

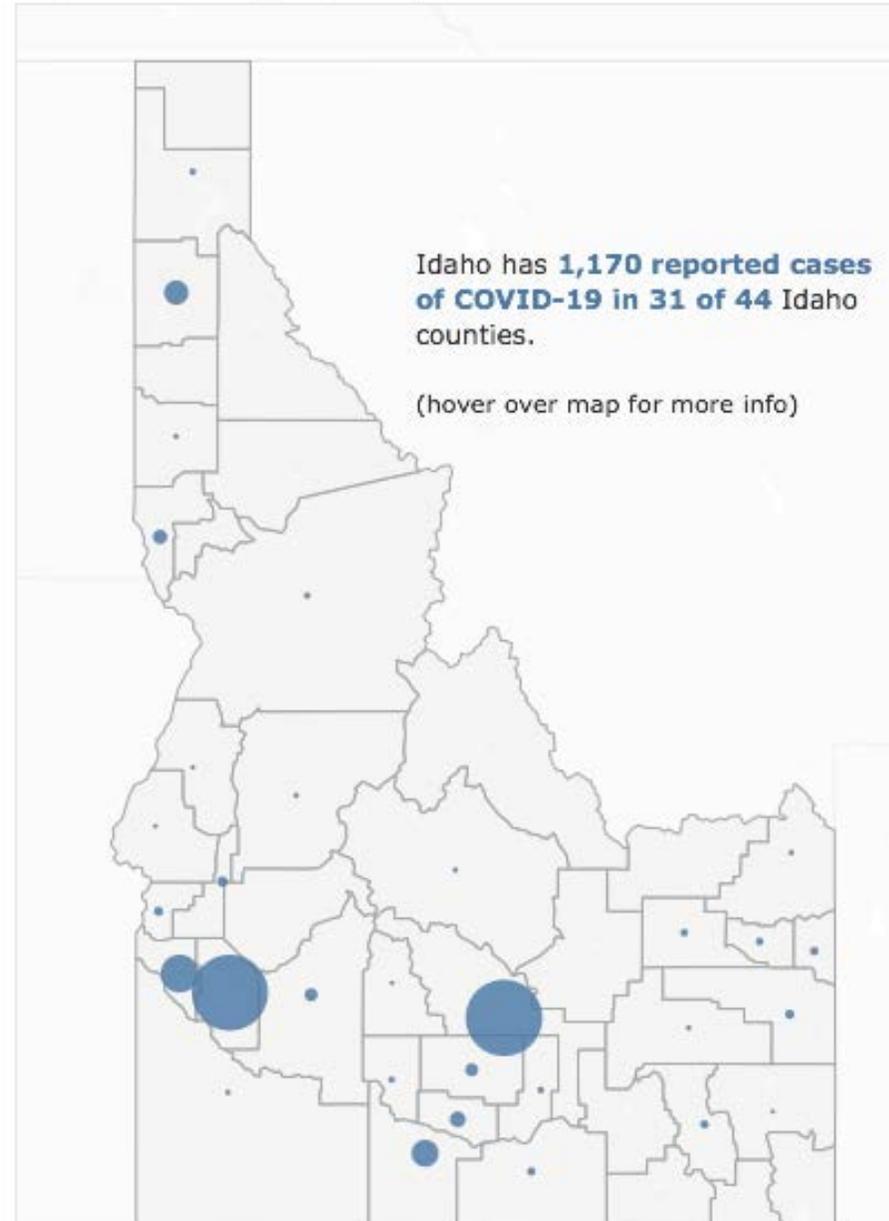
New Cases Today
(4/6)

13

Deaths

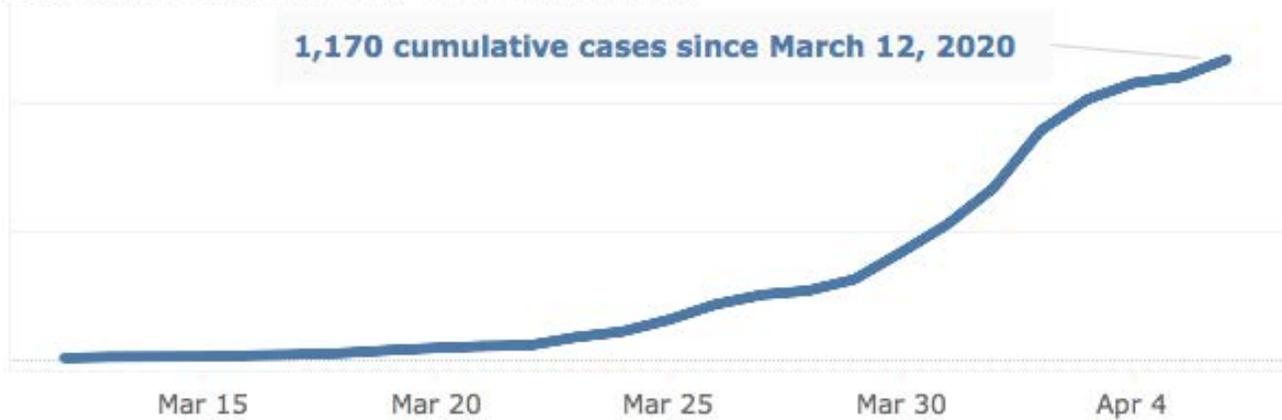
- At least 83 (7.1%) hospitalized
- At least 21 (1.8%) ICU
- At least 87 (7.4%) healthcare personnel

COVID-19 by County



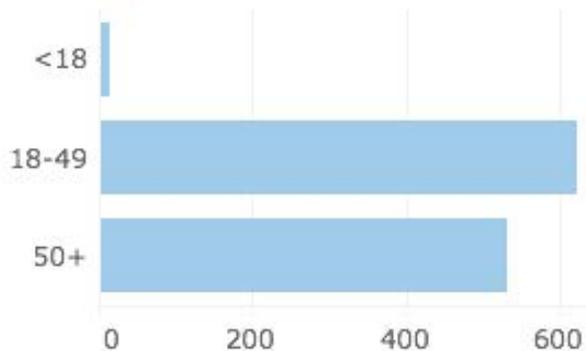
COVID-19 Trend

Cumulative Cases and Daily Case Count (below)

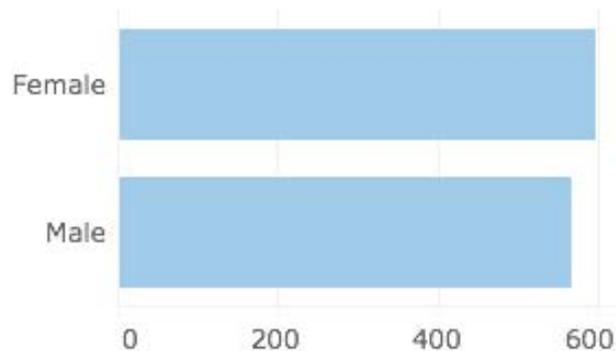


- Idaho Stay-at-Home order started on March 25.
- To be re-assessed before April 15.

COVID-19 by Age Group



COVID-19 by Sex



SARS-CoV-2 Testing in Idaho

- 117% (2.17 times) increase in testing at commercial labs in 7 days.
- Reminder of high priority for IBL
 - Hospitalized patients
 - Symptomatic healthcare workers
 - Symptomatic patients in long-term care facilities
- Notify your local public health district within 24 hours of shipment for high priority specimens for IBL.

| | |
|---|-------------|
| Number of people tested through the Idaho Bureau of Laboratories (IBL)* | 3/30: 1,567 |
| | 4/2: 1,851 |
| | 4/6: 2,263 |
| Number of people tested through commercial laboratories** | 3/30: 4,145 |
| | 4/2: 6,094 |
| | 4/6: 8,983 |

N95 vs Masks vs Cloth Facial Coverings



- REMINDER: Preserve PPE where possible = CDC PPE strategy page
- NEW CDC recommendation on use of cloth facial coverings
 - Not a substitute for social distancing (SD) and is NOT PPE
 - Considered for use in settings with difficult to maintain SD
 - Level of benefit is unclear
 - N=4 person study in Annals of Internal Medicine found no difference in virus in room with mask vs cloth, but significant methodologic issues
- NEW systematic review of N-95 vs surgical masks for non-high risk procedures (Bartoszek, et al)
 - 4 RCT's among HCW – no difference in lab confirmed viral respiratory illnesses or ILI.

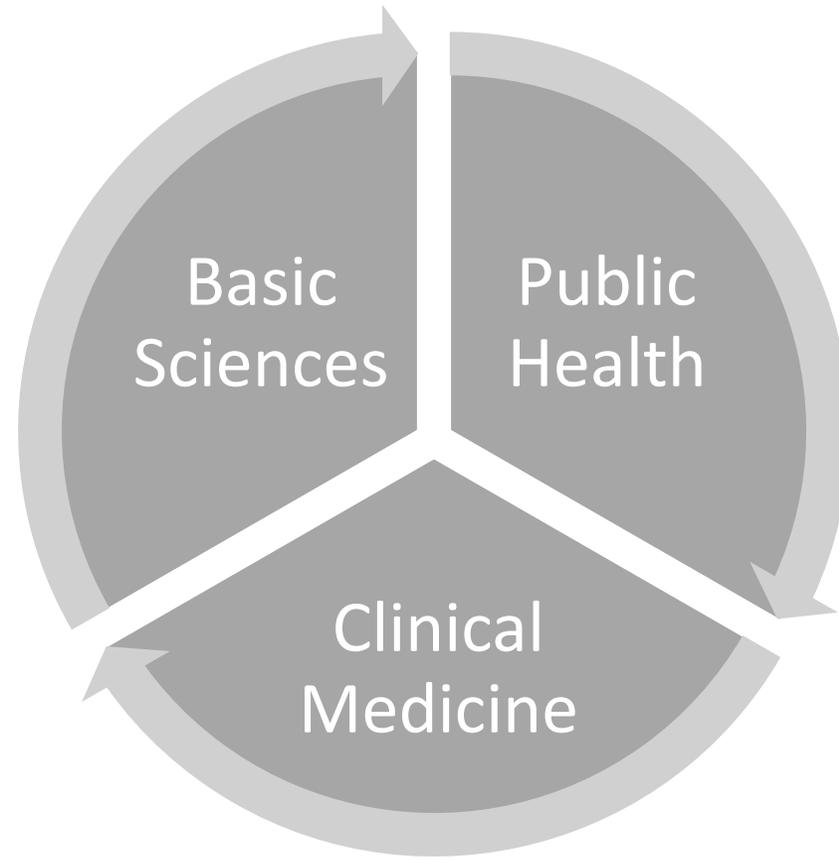
<https://annals.org/aim/fullarticle/2764367/effectiveness-surgical-cotton-masks-blocking-sars-cov-2-controlled-comparison>.
<https://onlinelibrary.wiley.com/doi/pdf/10.1111/irv.12745>.

The Gap

Public Health, Basic Sciences, Clinical Medicine
...and the space between

Megan Dunay, MD MPH, Geriatrician, Boise VA and Medical Director for
Geriatrics and Extended Care for VA Pacific Northwest Region

Mind the Gap



The way the world should be

| Clinical Care Consideration | Ideal Solution |
|---|--|
| How do we determine who has COVID-19? | <ul style="list-style-type: none">• Highly sensitive point of care test |
| How do we prevent the spread of COVID-19? | <ul style="list-style-type: none">• Wear specific equipment• Isolate patients who are positive in a consistent manner |
| How do we treat COVID-19 with antimicrobials? | <ul style="list-style-type: none">• Prevent via vaccination• Treat with a highly-effective antiviral• Prevent Immune-mediated sequelae |

The way the world is

| Clinical Care Consideration | Limitations |
|---|--|
| How do we determine who has COVID-19? | <ul style="list-style-type: none">• RT-PCR: virions, sub-cellular viral particles, cellular particles; 70% sensitivity at best?• Antibody Testing: detectable 10-12 days after onset of symptoms |
| How do we prevent the spread of COVID-19? | <ul style="list-style-type: none">• Virions in respiratory droplets?• Virions aerosolized? |
| How do we treat COVID-19 with antimicrobials? | <ul style="list-style-type: none">• Trials confounded by steroids• Trials confounded by ECMO• Patient selection• Outcomes that matter• Viral-mediated syndrome; immune-mediated syndrome |

Making sense of our world

| Philosophy of Science | Morality: The way the world should be <i>Rousseau, John Locke</i> | Rationality: The way the world is <i>Thomas Hobbes, Ayn Rand</i> |
|--|---|--|
| Epistemology | | <ul style="list-style-type: none"> • How do we accept things as true? • How do we justify that acceptance? |
| Empiricism: <i>Piere Duhem</i> | We should only accept observable evidence | |
| Induction: <i>Francis Bacon</i> | Individual examples → Generalizations | |
| Deduction: <i>Rene Descartes</i> | | Premises → Logical conclusions Sherlock Holmes |
| Falsification: <i>Karl Popper</i> | Evidence can only be used to rule out ideas, not to support them | Evidence can only be used to rule out ideas, not to support them |

The Basic Science of COVID-19: Virology and Immunology

This much I know is true (at least for today...)

Tanya Miura, PhD

Microbiology, Associate Professor, University of Idaho

A timeline of coronavirus infections in humans

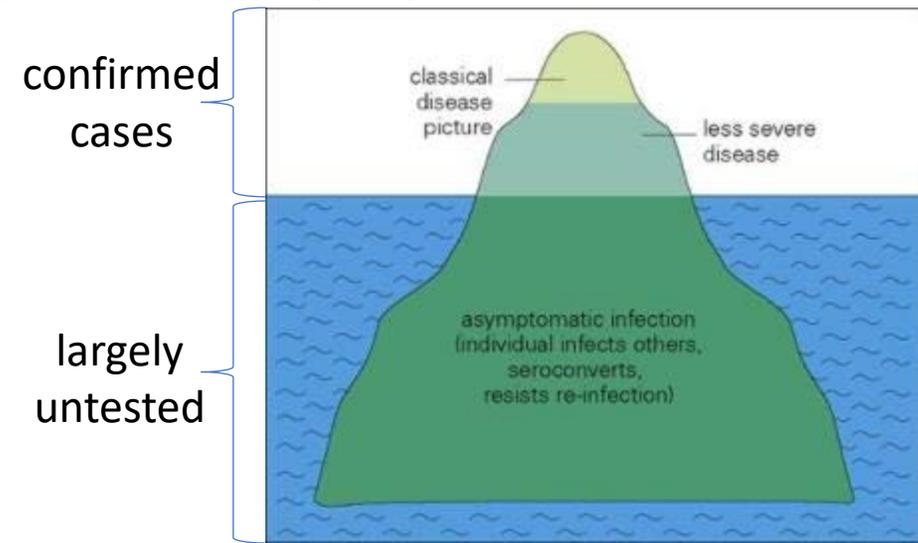
★ New introduction into humans



SARS = Severe Acute Respiratory Syndrome
 November 2002 – July 2003
 8,273 Cases/775 Deaths (~10%)

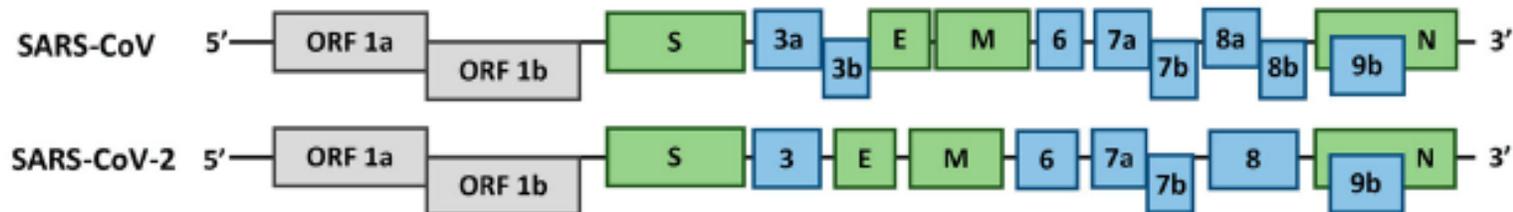
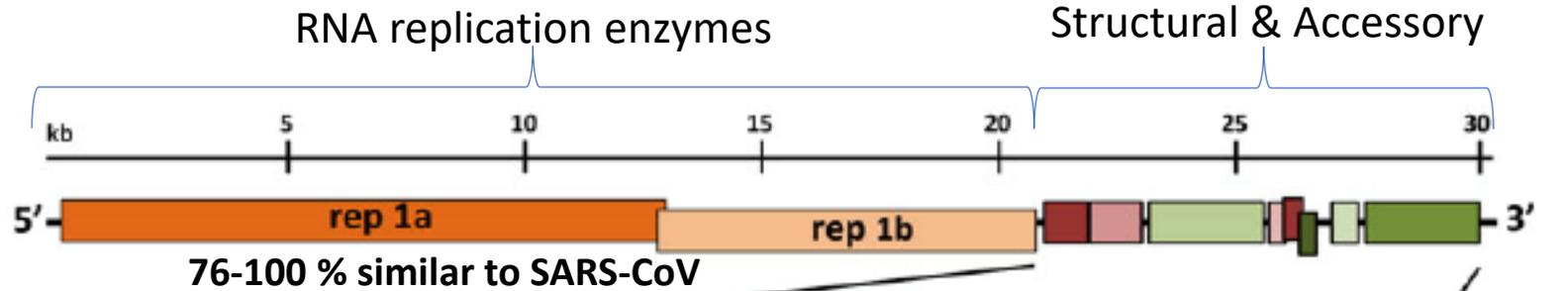
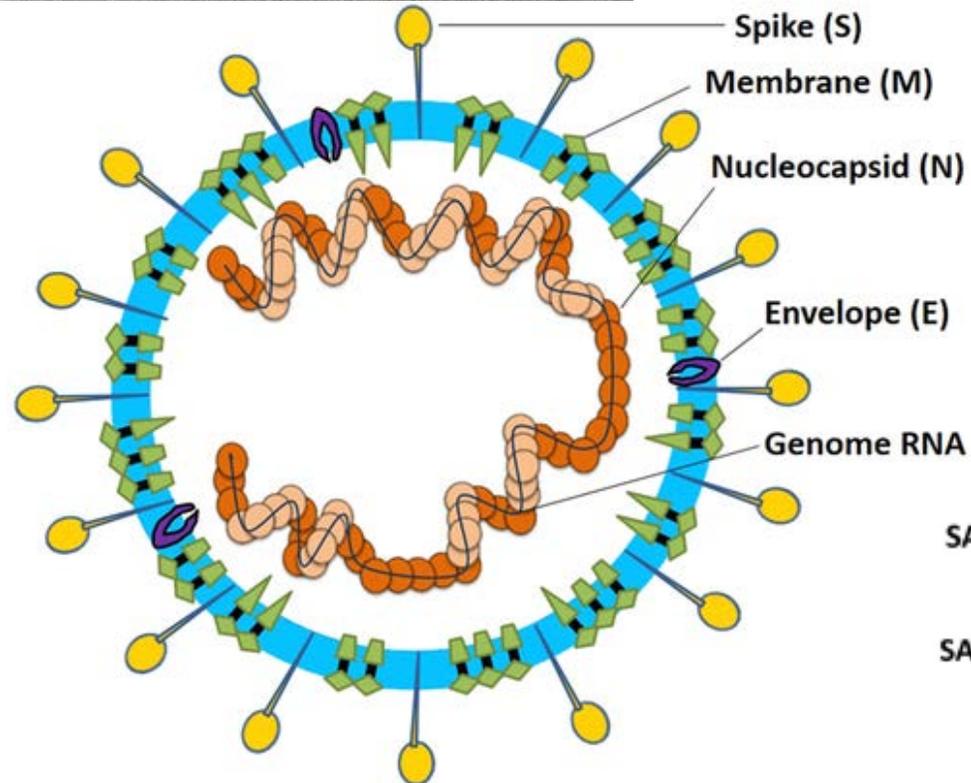
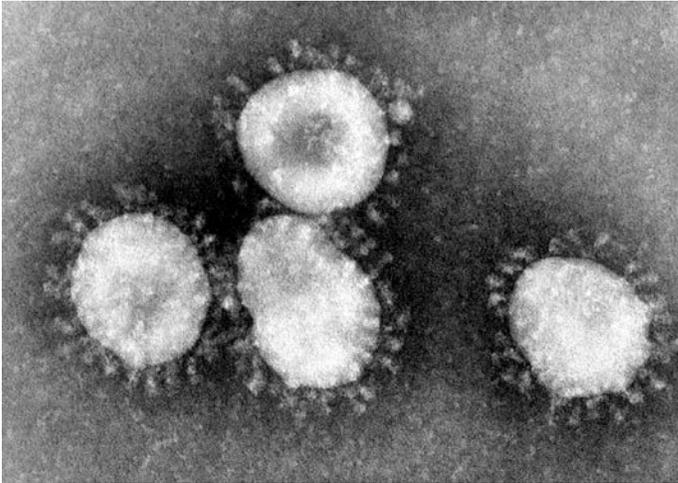
COVID-19 = SARS-CoV-2
 November 2019 – Current
 1,346,299 Cases/74,679 Deaths (~5%)??

MERS = Middle East Respiratory Syndrome
 June 2012 - Present
 2,519 Cases/866 Deaths (~34%)
 Saudi Arabia 2,121/788
 S Korea 2015: 186/36

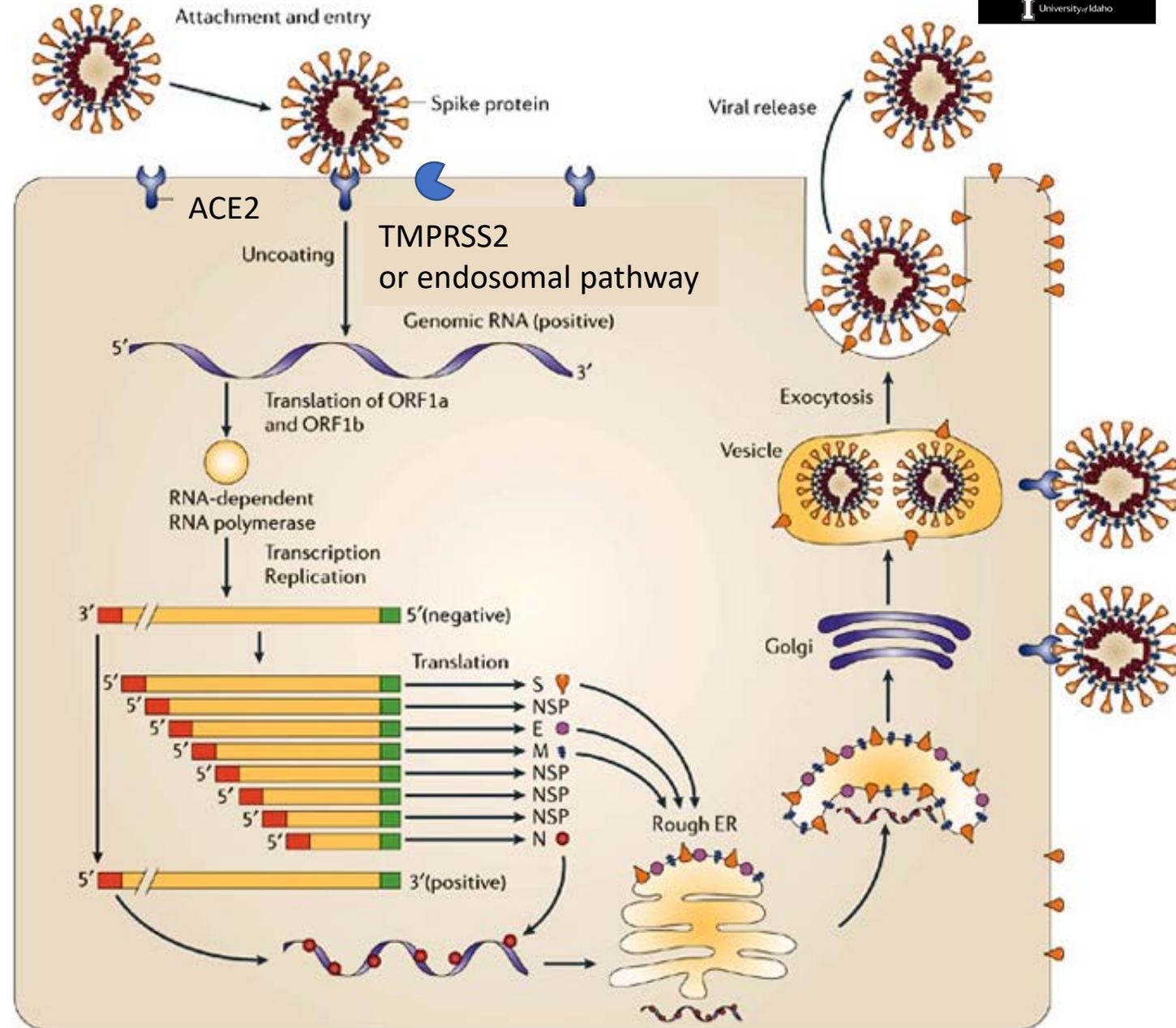
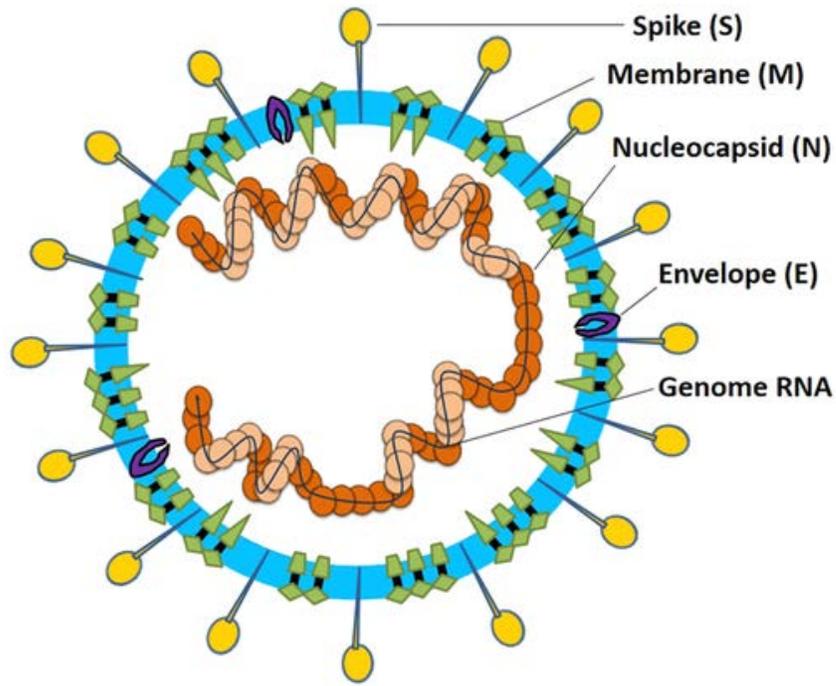
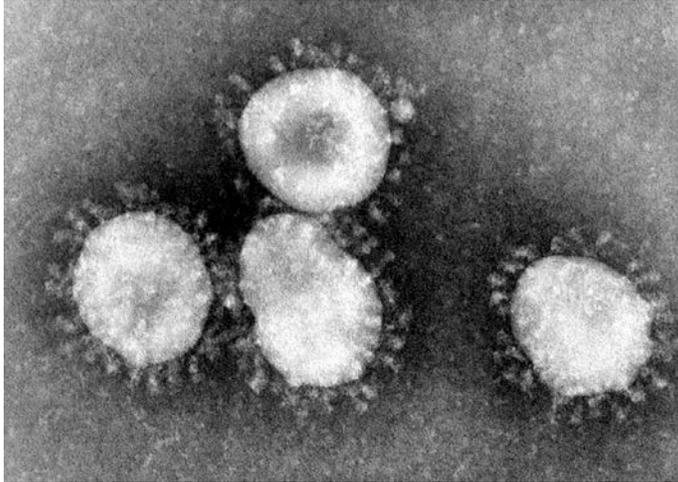


ECHO IDAHO

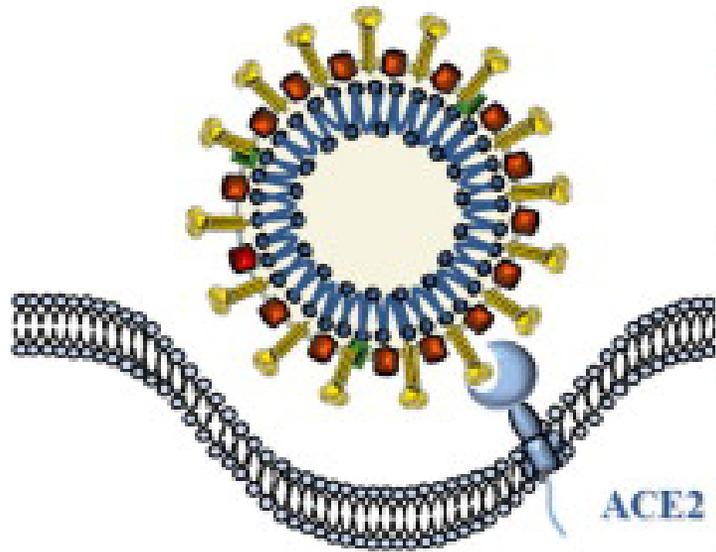
Coronaviruses: Structure and Replication



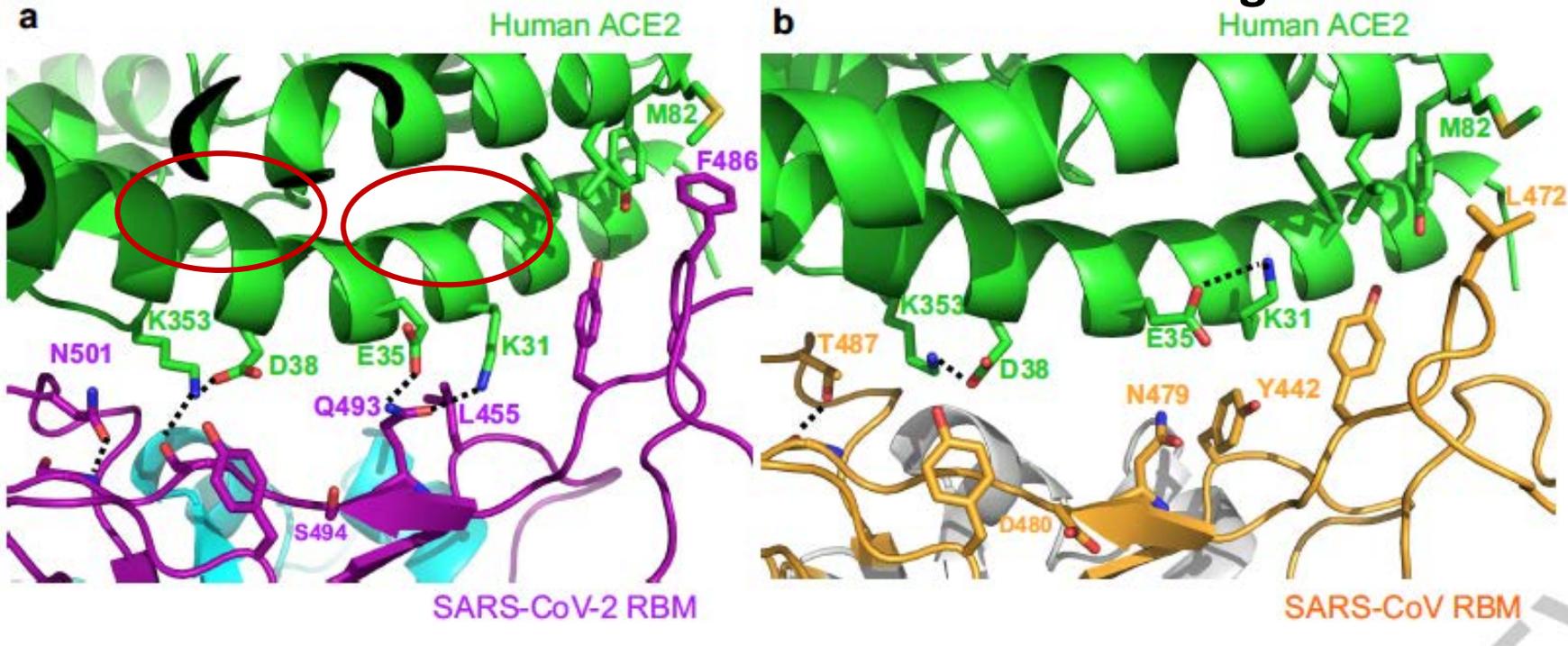
Coronaviruses: Structure and Replication



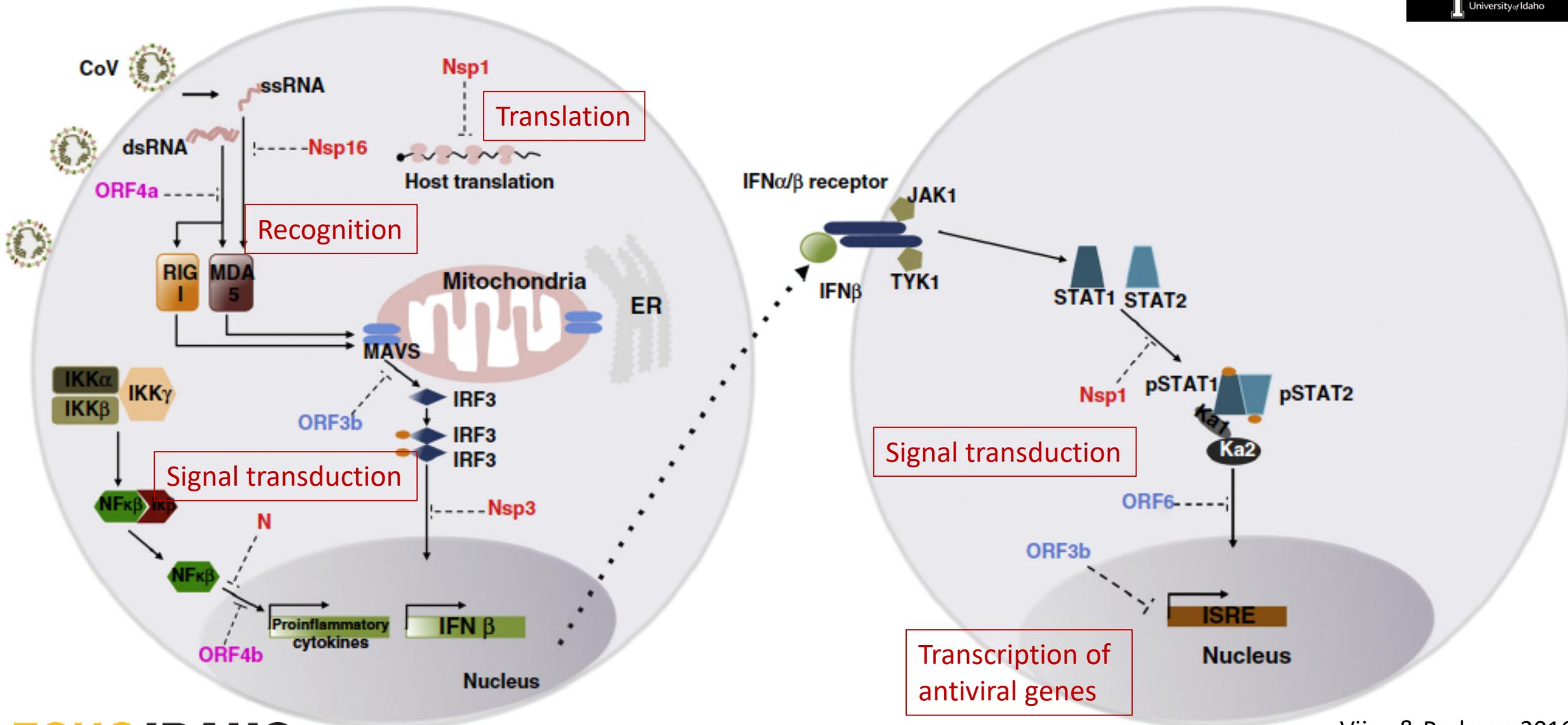
Angiotensin Converting Enzyme 2 (ACE2) is the entry receptor for SARS-CoV-2



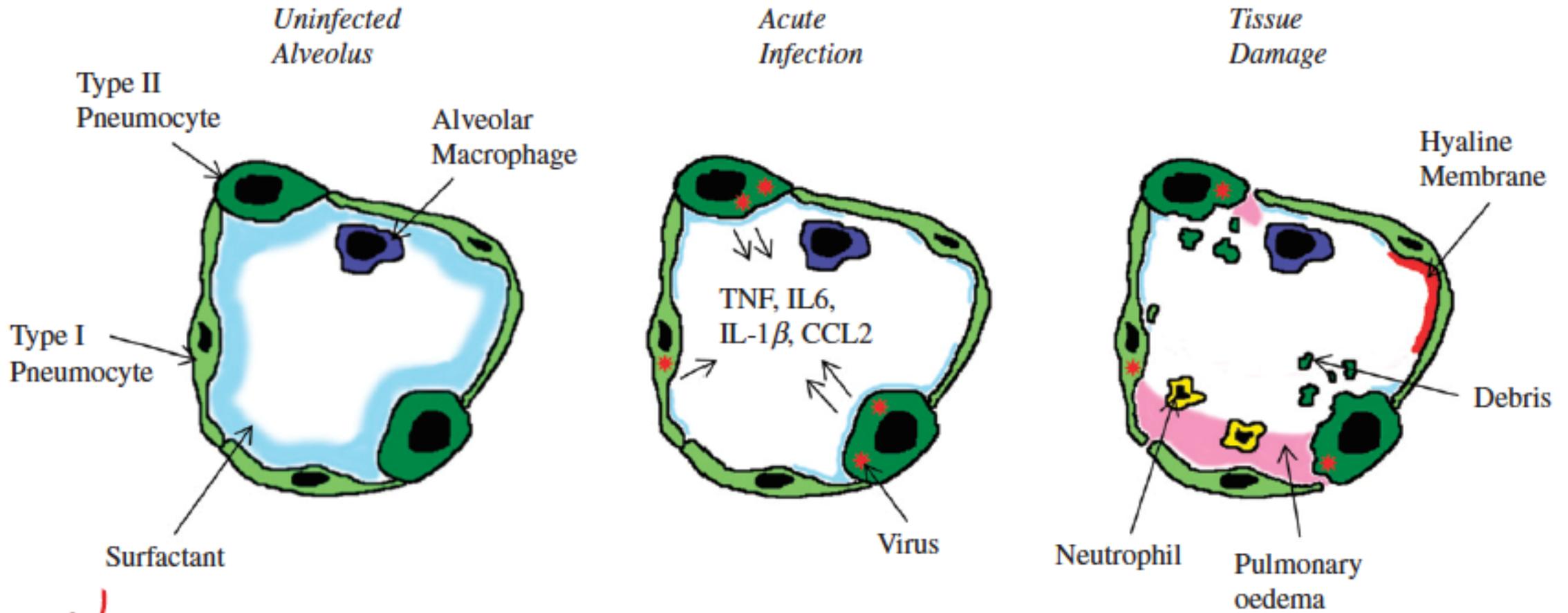
SARS-CoV-2 is better than SARS-CoV at binding ACE2



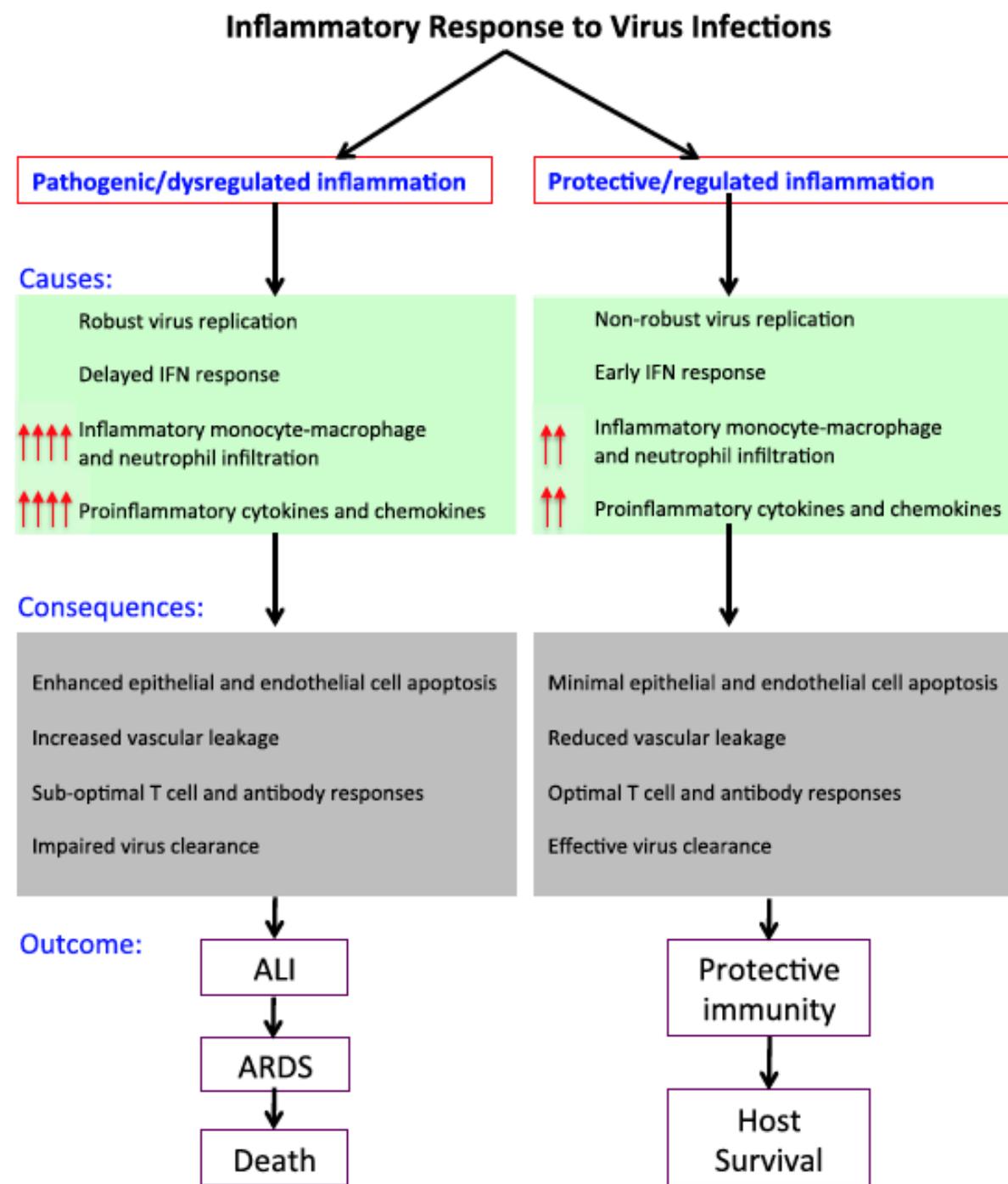
Immune responses to coronaviruses: evasion of innate antiviral response



Immune responses to coronaviruses: immune-mediated damage



Immune responses to CoV: dysregulated inflammation



Source: Channappanavar & Perlman 2017
Seminars in Immunopathology

Review of Clinical Pearls & Q & A

Sky Blue, MD Infectious Disease Medicine

Tanya Miura, PhD, Microbiology, University of Idaho

Cathy Oliphant, PharmD, Infectious Disease, Professor and Interim
Chair, ISU College of Pharmacy

More to come...

- Friday, April 10 – Goals of Care: Difficult Conversations and Clinical Palliative Care for COVID-Positive Patients

Opioid Addiction and Treatment Series

- Thursday, April 9 – Managing Common Psychiatric Conditions and Substance Use Disorder through COVID-19