2026 California Thoracic Society Annual Educational Conference

& Chronic Obstructive Pulmonary Disease Symposium

Thursday March 12, 2026-Sunday March 15, 2026

Earn up to 19 CME/CEU/MOC Credits

Jointly Provided by AKH Inc., Advancing Knowledge in Healthcare and the California Thoracic Society

PORTOLA HOTEL & SPA
AT MONTEREY BAY

Thursday March 12, 2026 (6 CME/CEU/MOC Credits)
COPD Symposium
Friday March 13, 2026 (6.5 CME/CEU/MOC Credits):
Advances in Interventional Pulmonary, Remote Monitoring in Pulmonary and Sleep Medicine, Approach to Symptom Management in Chronic Lung Disease and Critical Care
Saturday March 14, 2026 (6.5 CME/CEU/MOC Credits)
Sepsis and Shock, Extracorporeal Membrane Oxygenation, Inpatient Pulmonary Complications of Cancer Care
Sunday March 15, 2026
Fellow and Resident Track Symposium

California Thoracic Society
ATS Chapter Serving California and Arizona

AKH INC.
ADVANCING KNOWLEDGE IN HEALTHCARE

California Thoracic Society
Annual Conference
March 12-15, 2026
Portola Hotel and Spa, Monterey, CA

Saturday March 14, 2026

Advances in Management of the Patient with Sepsis

8:00 am – 8:10 am: Welcome and Introduction

8:10 am – 8:55 am: Keynote Address – Phenotyping and Personalized Medicine in Sepsis

- **Angela Rogers, MD (Stanford)** - This speaker will discuss phenotyping in the patient with sepsis and septic shock and how close we are to precision medicine in managing sepsis.

8:55 am – 9:20 am: Incorporating Artificial Intelligence Decision Making in Identifying Sepsis

- **Gabriel Wardi, MD (UC San Diego)** - This speaker will describe how artificial intelligence can be used to identify the septic patient before they present with end stage symptoms to impact care earlier in the course of illness.

9:20 pm – 9:35 pm: Pro: The Severe Sepsis and Septic Shock Early Management Bundle (SEP-1) Bundle Saves Lives

- **Sean Townsend, MD (CPMC-Sutter)**- This speaker will argue the benefits of the SEP-1 Bundle/how it saves lives.

9:35 pm – 9:50 pm: Con: : The Severe Sepsis and Septic Shock Early Management Bundle (SEP-1) Bundle Does Not Save Lives

- **Natalie Achamallah, MD, MS (Cottage Health)** - This speaker will argue the against the SEP-1 Bundle/highlight its limitations.

9:50-10:00 am Question and Answer

10:00 am – 10:30 am: Break

Extracorporeal Membrane Oxygenation

10:30 am – 10:55 am: When to refer to an ECMO center and when to deploy ECMO

- **Nida Qadir, MD (UC Los Angeles)** - This speaker will discuss the evidence behind the use of ECMO in patients with respiratory failure and when providers should consider referral to an ECMO center and when centers should use ECMO.

10:55 am – 11:20 am: What about ECMO to go?

- **Mazen Odish, MD (UC San Diego)** - This speaker will discuss the advent of mobile ECMO services, how they can help improve patient care, and the use of extracorporeal cardiopulmonary resuscitation.

11:20 am – 11:45 pm: Ventilator Strategies for the patient on ECMO

- **Abirami Kumaresan, MD (Cedars-Sinai)** - This speaker will discuss the how ventilator strategies may differ in the patient on ECMO and how different ECMO configurations impact which ventilator strategy to use.

11:45 pm – 12:10 pm: What you need to know about pediatric ECMO

- **Kathleen Ryan, MD (Stanford)** - This speaker will discuss the utility of ECMO in neonates and children, and the complexities of management in children who needs mechanical support.

12:10 pm – 12:20 pm: Question and Answer

12:20 pm – 1:20 pm: Lunch

Hands-On Session:

1:20 pm – 2:20 pm: Non-Invasive Cardiac Output Monitors **Speaker Abirami Kumaresan, MD (Cedars-Sinai)** ECMO Machines **Mazen Odish, MD (UC San Diego)** ECMO Placement **David Gordon, DNP (UC San Francisco) & Brianna Zuckerman, NP (UC San Francisco)** Ventilator Settings and Portable ventilators **Joe Van Vleet, RT (UC Los Angeles) & Theresa Cantu, RT (Valley Children's)**

2:20 pm – 2:45 pm: Break

Inpatient and Pulmonary Complications of Cancer Care

2:45 pm – 3:10 pm: Pulmonary Complications of Hematopoietic Stem Cell Transplantation

- **Husham Sharifi, MD (Stanford)** - This speaker will discuss the pulmonary complications that arise after HCT, in particular the development of bronchiolitis obliterans syndrome and approaches to management.

3:10 pm – 3:35 pm: Pulmonary Vascular Complications of Malignancy

- **Naomi Habib, MD (Norton Thoracic Institute)**- This speaker will discuss the Pulmonary Vascular Disease complications of malignancy including PA sarcoma, pulmonary tumor thrombotic microangiopathy, and medications that can cause PAH.

3:35 pm – 4:00 pm: Drug induced Interstitial Lung Disease and Pneumonitis During Cancer Therapy

- **Weijia Chua, MD (Stanford)** - This speaker will discuss the pulmonary complications of interstitial lung disease and pneumonitis that develop after chemotherapy and targeted immunotherapy

4:00 pm – 4:25 pm: Respiratory Complications of Acute Leukemia

- **Hugh Davis, MD (City of Hope)** - The speaker will discuss various oncologic emergencies, how they are recognized, and how they are managed in the acute setting.

4:25 pm – 4:35 pm: Question and Answer

5:30 pm – 7:30 pm: Trainee Poster Competition (NON-CME) – Food and beverages will be served

Dr. Angela Rogers received her medical degree from Harvard Medical School in 2001 and her MPH from Harvard School of Public Health in 2008. She is a Professor of Pulmonary, Allergy, and Critical Care Medicine at Stanford, where she works clinically in the ICU and leads translational research in ARDS and sepsis, using genomics of human samples to subphenotype disease and advance precision medicine in the ICU. She is passionate about training physician scientists, serving as an APD for both Stanford's IM residency and PCCM fellowship, and is the past chair of the Allergy, Immunology, and Inflammation Assembly at ATS.

Phenotyping & Personalized Medicine in Sepsis

Angela Rogers, MD MPH
Stanford University

March 14, 2026

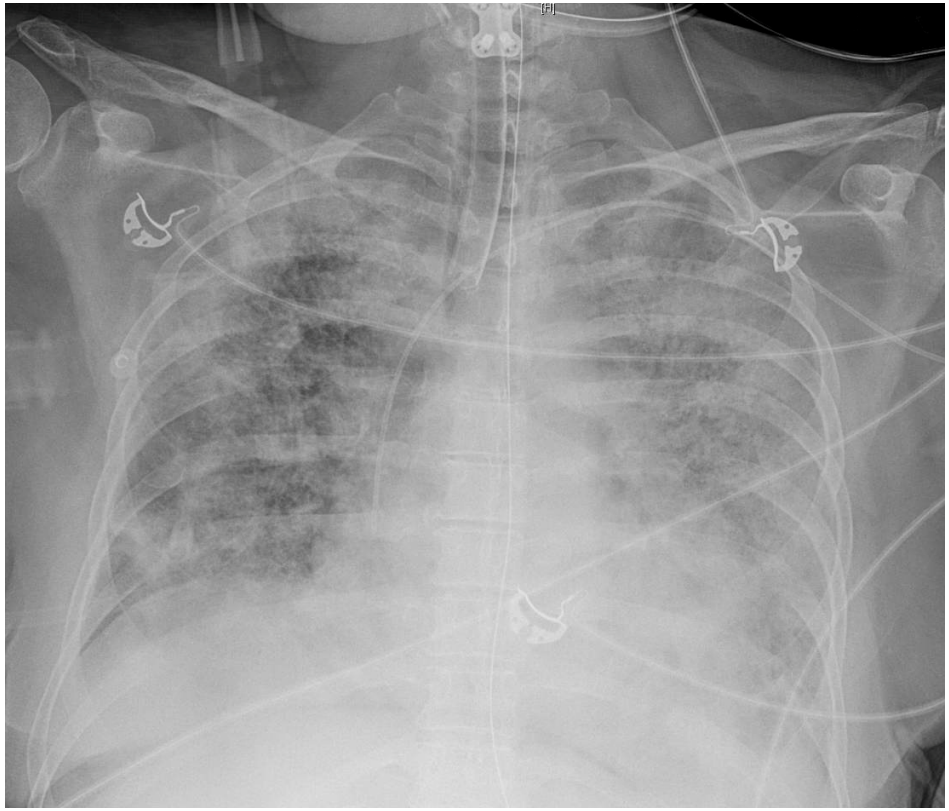
Disclosures

- I have no relationships with any company
- I **WILL** discuss off-label use and/or investigational use of the TriVerity device by Inflammatix.

Outline

- A very brief background on Acute Respiratory Distress Syndrome(ARDS) and the state of ICU research pre-COVID-19
- The special case of COVID-19 ARDS
- The future: Using ‘omics to identify biology and actionable subgroups of ICU syndromes

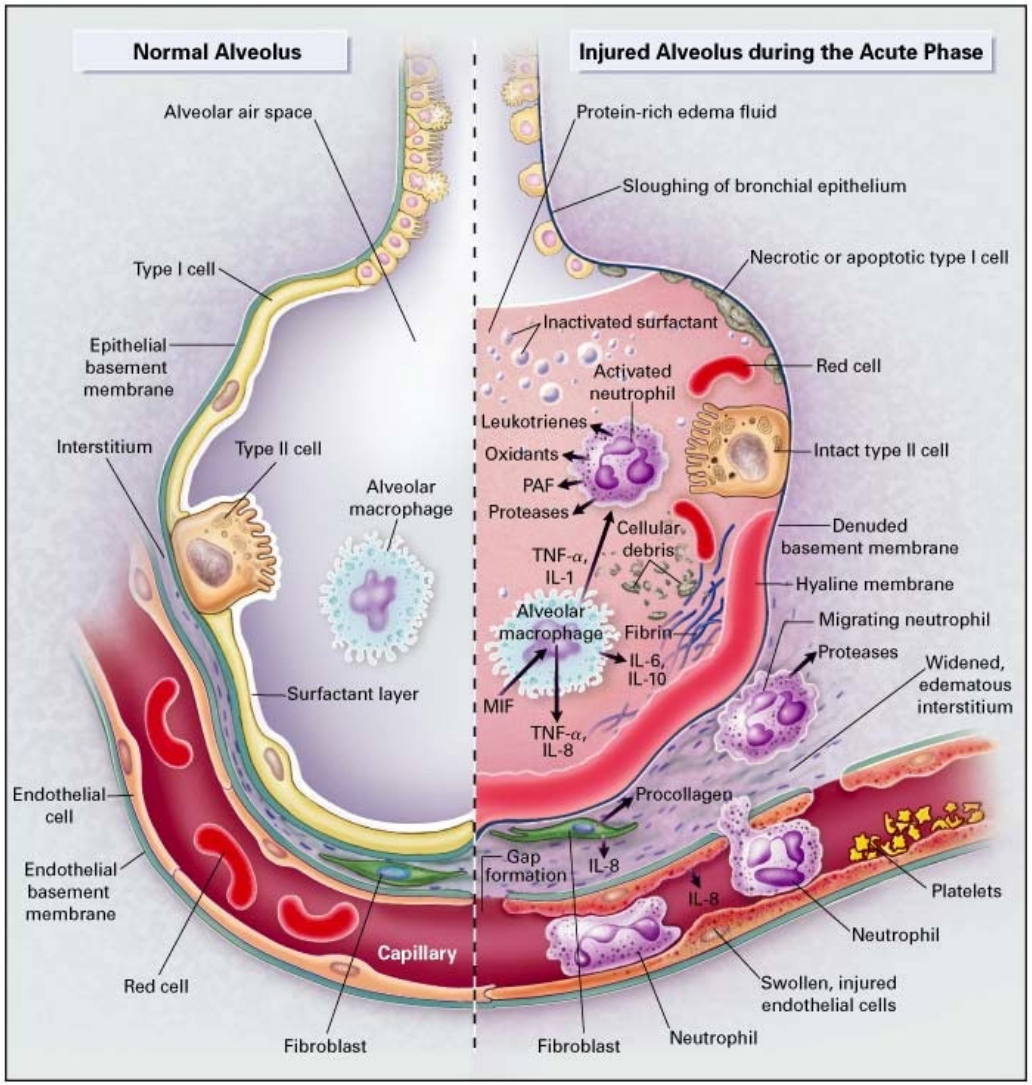
ARDS: a simply defined syndrome



Acute Respiratory Distress Syndrome:

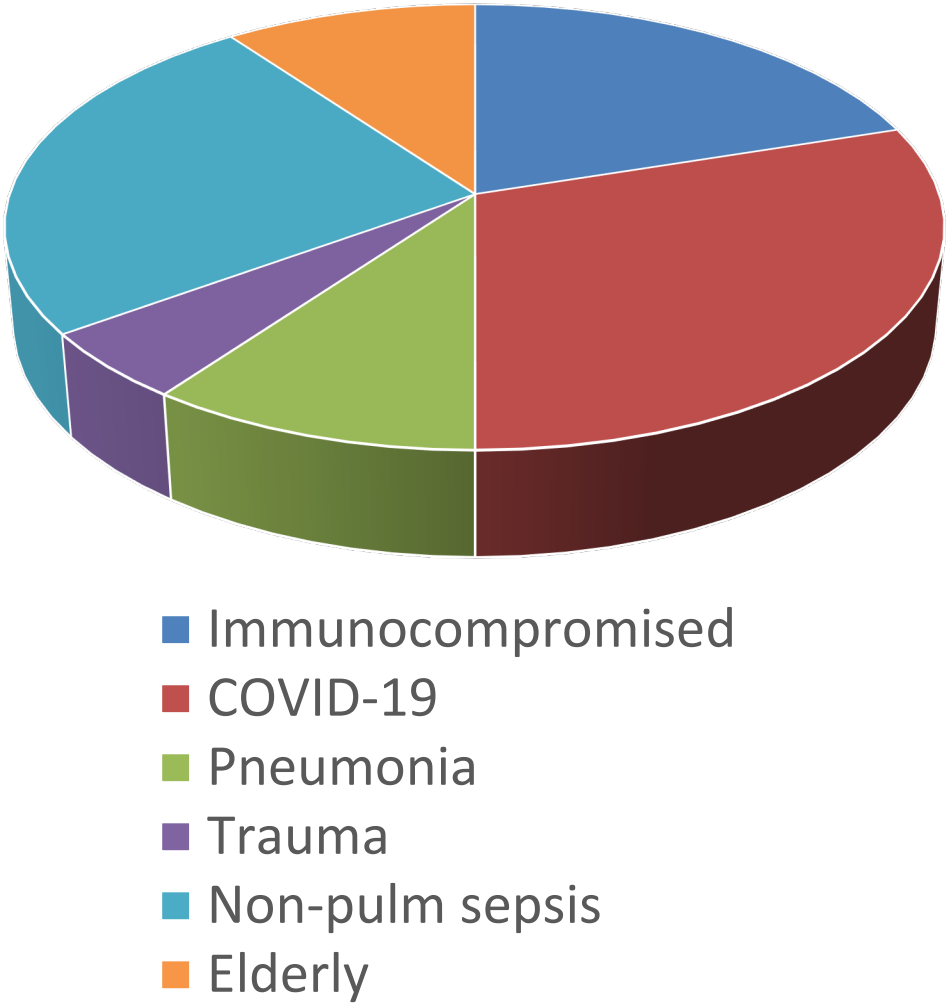
- Acute onset, in setting of risk factor
- P:F ratio <300
- Bilateral opacities
- Not explained by hydrostatic edema

Complex pathophysiology



Ware & Matthay, NEJM 2000

Diverse phenotypes, all lumped together as ARDS



The state of research in ARDS and sepsis, pre-COVID-19

A desperate need for advances in critical care

ARDS THERAPEUTICS AND CLINICAL TRIALS: WHAT WENT WRONG?

[2:00 PM] The Immune Response In ARDS : Where Are We Now?
Speaker: S.M. Opal, MD
Providence, RI/US

[2:25 PM] Animal Models In ARDS: Where Have We Gone Wrong?
Speaker: J.C. Marshall, MD
Toronto, ON/CA

[2:45 PM] ARDS Clinical Trials: What Went Wrong?
Speaker: B.T. Thompson, MD
Boston, MA/US

[3:10 PM] ARDS Clinical Trials: Can We Improve?
Speaker: D.C. Angus, MD, MPH
Pittsburgh, PA/US

[3:35 PM] Definitions And Risk Assessment In ARDS: Are They Helpful Or Accurate?
Speaker: J.-L. Vincent, MD, PhD
Brussels/BE

[4:00 PM] Recommendations For ARDS Management: Is There A Minimum Standard Of Care?
Speaker: M.M. Levy, MD
Providence, RI/US

Pre-2020 ARDS drug trials

The NEW ENGLAND JOURNAL of MEDICINE
ESTABLISHED IN 1812 APRIL 20, 2006 VOL. 354 NO. 16

Efficacy and Safety of Co... Respiratory

The National Heart, Lung, and Blood In... Clini...

Jean-Louis Vincent
Rainer Brase
Frederick Santman
Peter M. Suter
Angela McLuckie
Jean-François Dhainaut
Younchoi Park
Jacky Karmel

A multi-centre, double-blind, placebo-controlled study of liposomal prostaglandin E1 (TLC C-53) in patients with acute respiratory distress syndrome

No mortality benefit in phase III trials

Ketoconazole for Early Treatment of Acute Lung Injury and Acute Respiratory Distress Syndrome
A Randomized Controlled Trial

The ARDS Network Authors for the ARDS Network

Context Three clinical studies have suggested that ... with anti-inflammatory activity, may prevent the de...

Effect of Intravenous Interferon β-1a on Death and Days Free From Mechanical Ventilation Among Patients With Moderate to Severe Acute Respiratory Distress Syndrome
A Randomized Clinical Trial

V. Marco Ranieri, MD; Ville Pettilä, MD, PhD; Matti K. Karvonen, MD, PhD; Juho ...
Peter Nightingale, MD; David Brealey, MD, PhD; Jordi Mancebo, MD, PhD; Rica...
Alain Mercat, MD, PhD; Nicolò Patroniti, MD, PhD; Michael Quintel, MD, PhD; J...
Marjatta Okkonen, MD, PhD; Ferhat Meziani, MD, PhD; Giacomo Bellani, MD, P...
Jacques Creteur, MD, PhD; Stefan Kluge, MD; Antonio Artigas-Raventos, MD, P...
Ilse Piippo, MD; Kati Elima, MD, PhD; Sirpa Jalkanen, MD, PhD; Markku Jalkane...
for the INTEREST Study Group

ORIGINAL ARTICLE

Rosuvastatin for Sepsis-Associated Acute Respiratory Distress Syndrome

The National Heart, Lung, and Blood Institute
ARDS Clinical Trials Network*

Randomized Clinical Trial of ... Treatment of Acute Lung Injury

Kathleen D. Liu[1], Joseph Levitt[2], Hanjing Zhuo[3], Richard H. Kallet[3], Sandra Brady[3], Jay Steingrub[4], Mark Tidswell[4], Mark D. Siegel[5], Graciela Soto[6], Michael W. Peterson[7], Mark S. Chesnutt[8], Charles Phillips[8], Ann Weinacker[2], B. Taylor Thompson[9], Mark D. Eisner[10], and Michael A. Matthay[11]

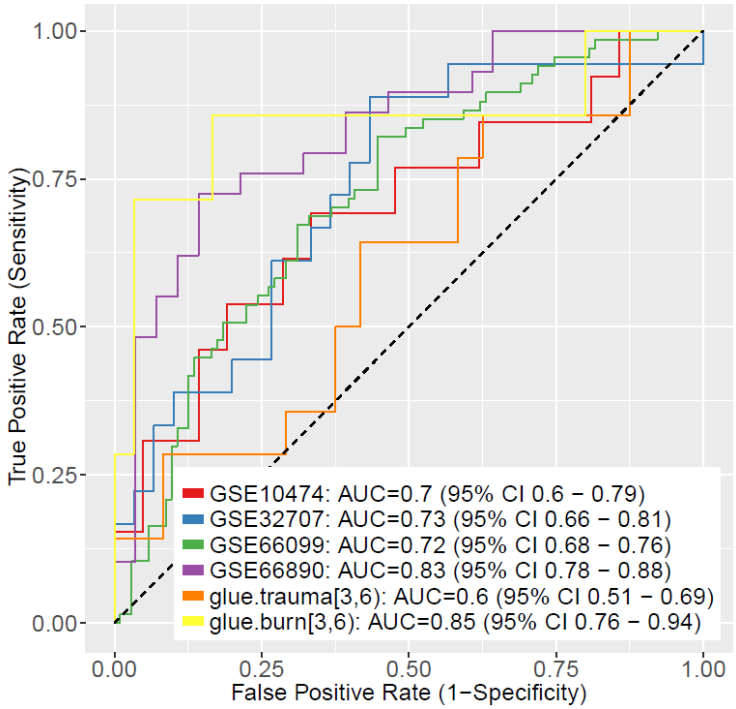
Slide courtesy of Joe Levitt

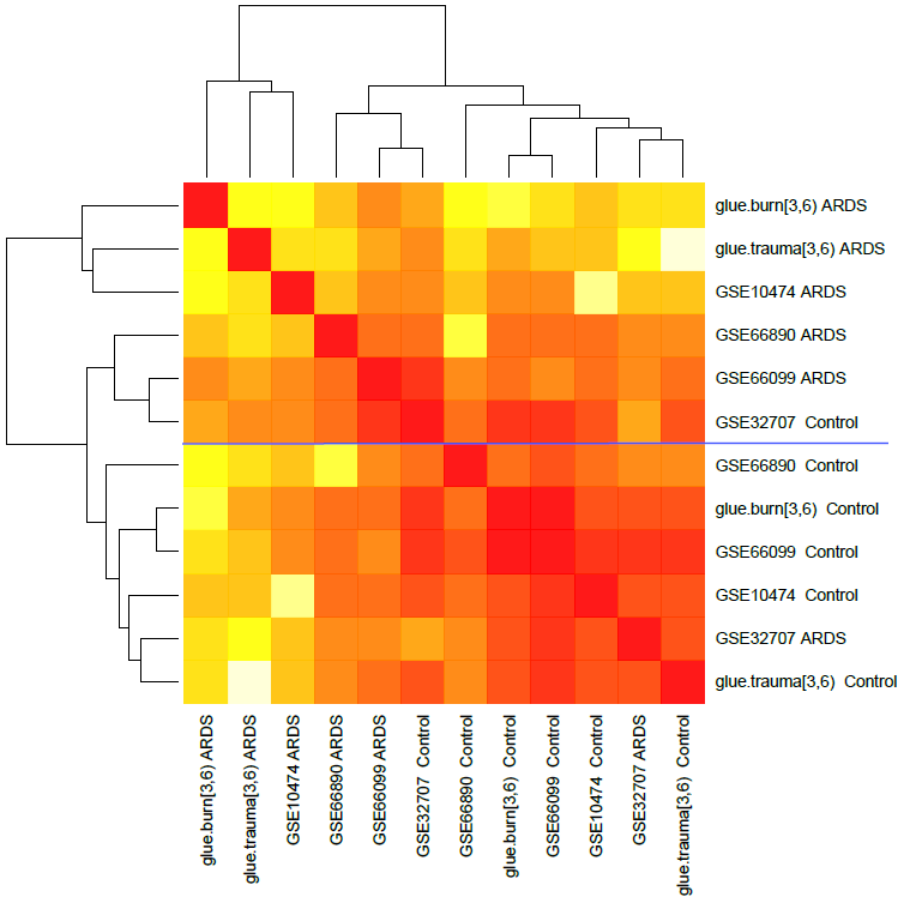
My early publications at Stanford

Does precision medicine stand a chance in the ICU?

Angela Rogers
Stanford University
PCCM Grand Rounds
September 2019

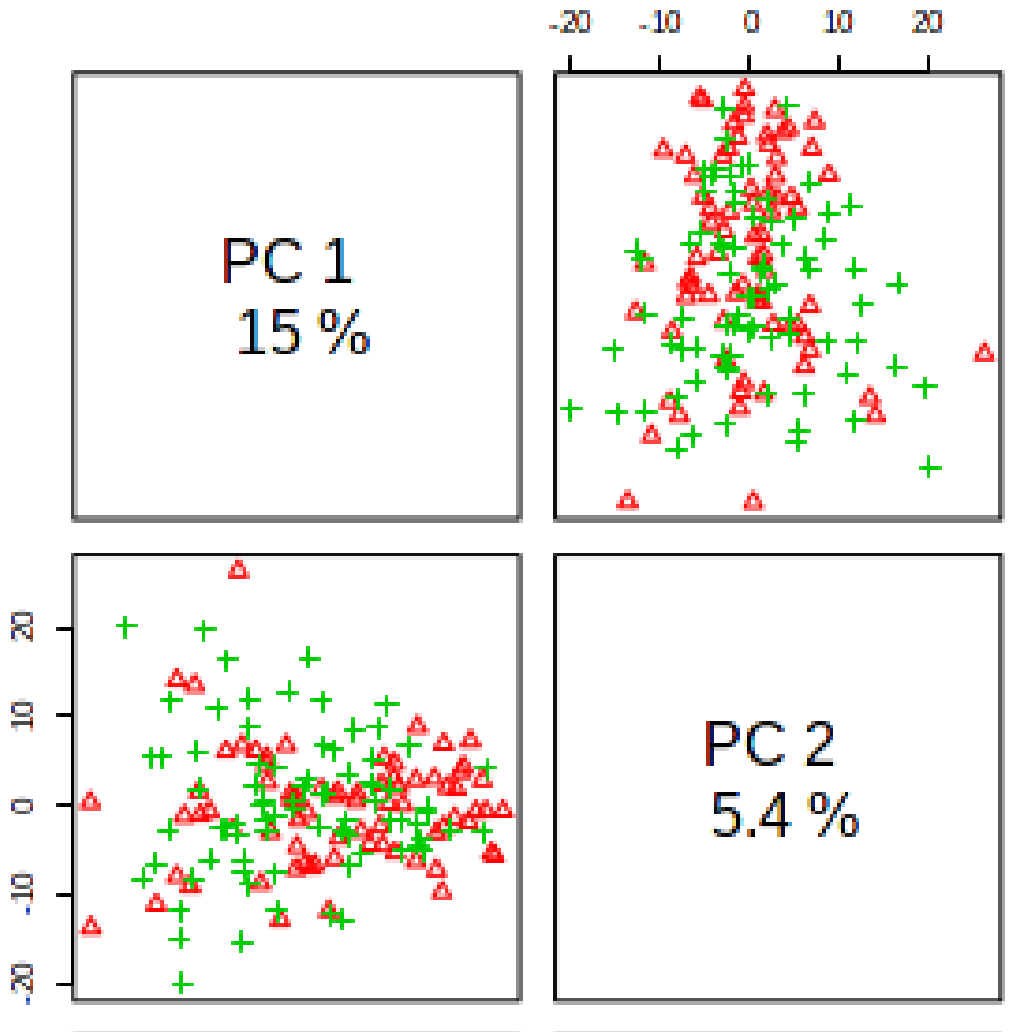
Gene expression





Sweeney et al., *CCM* 2018

Metabolomics

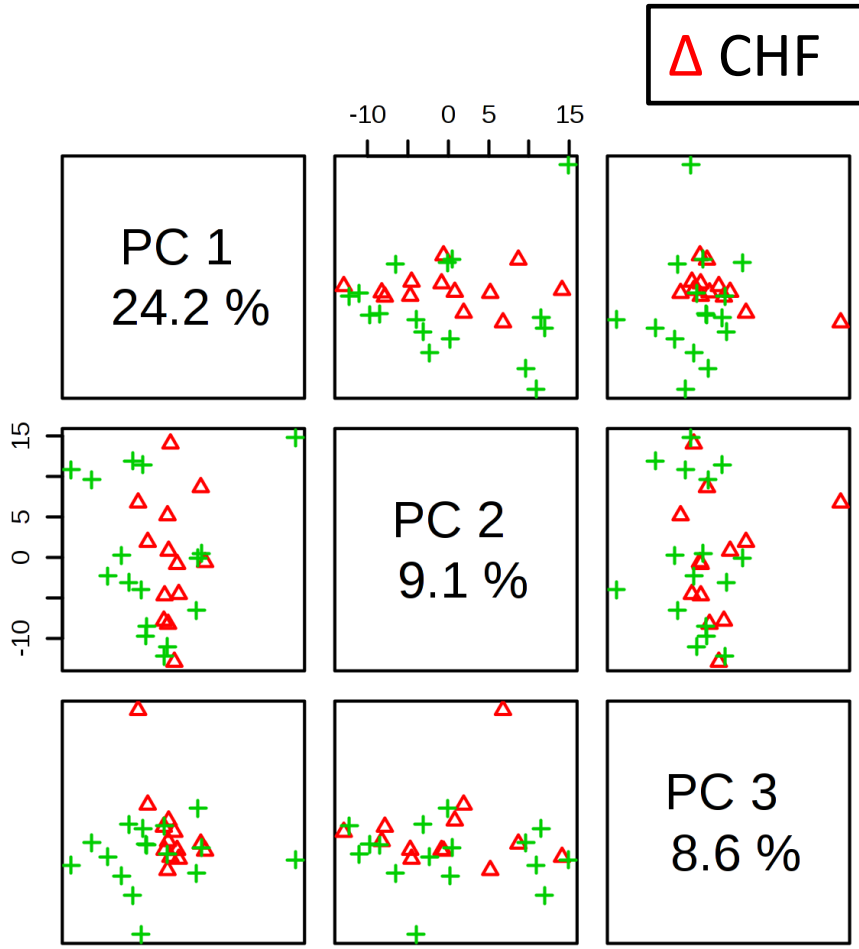


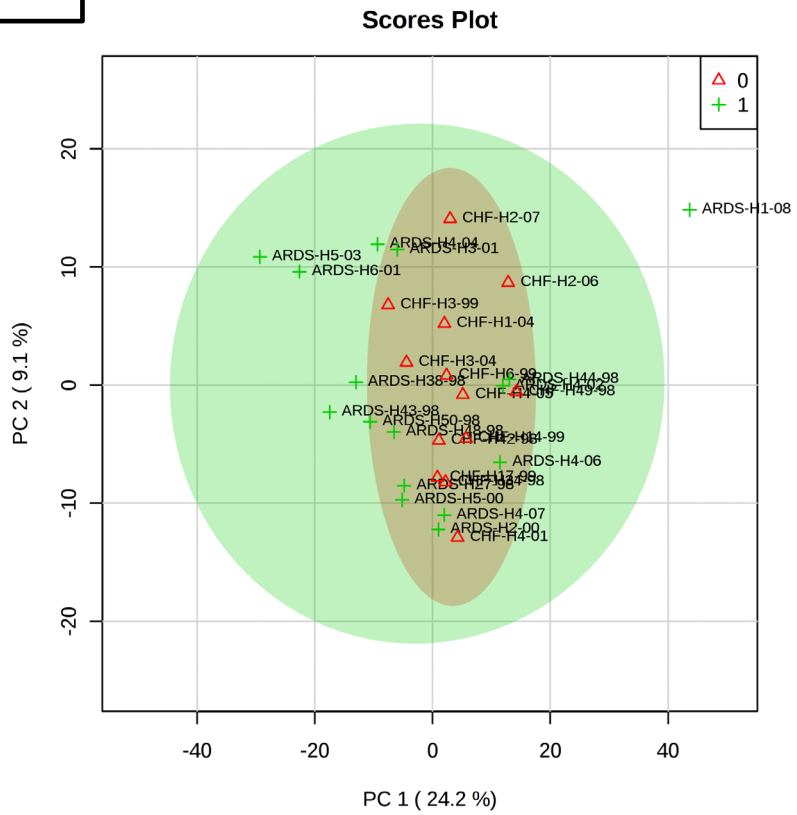
ARDS +

Sepsis △

Rogers et al., *CCE* 2021

Edema fluid metabolomics of ARDS vs CHF

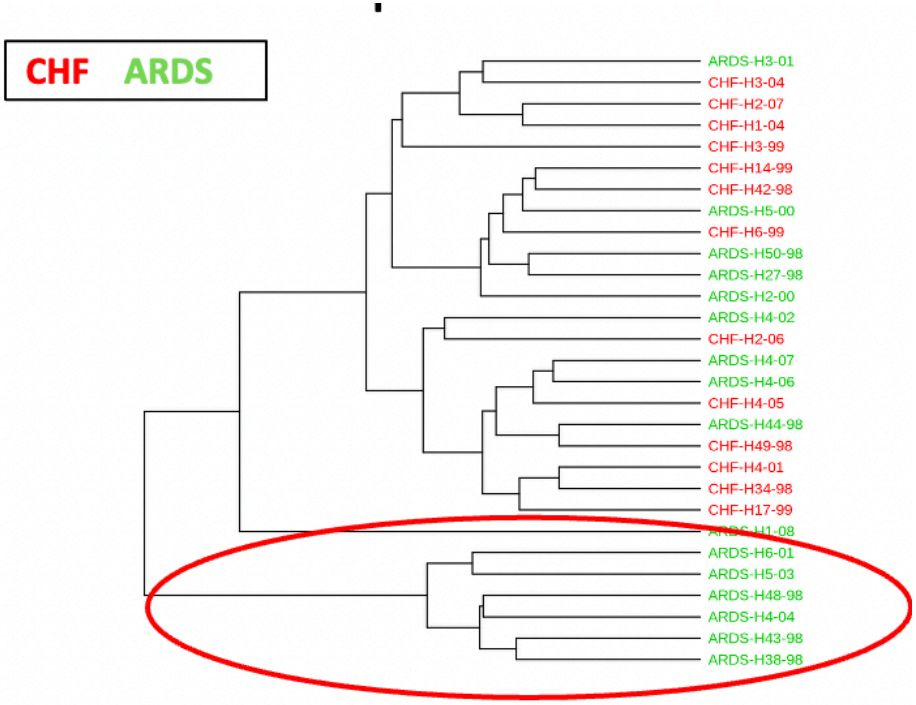


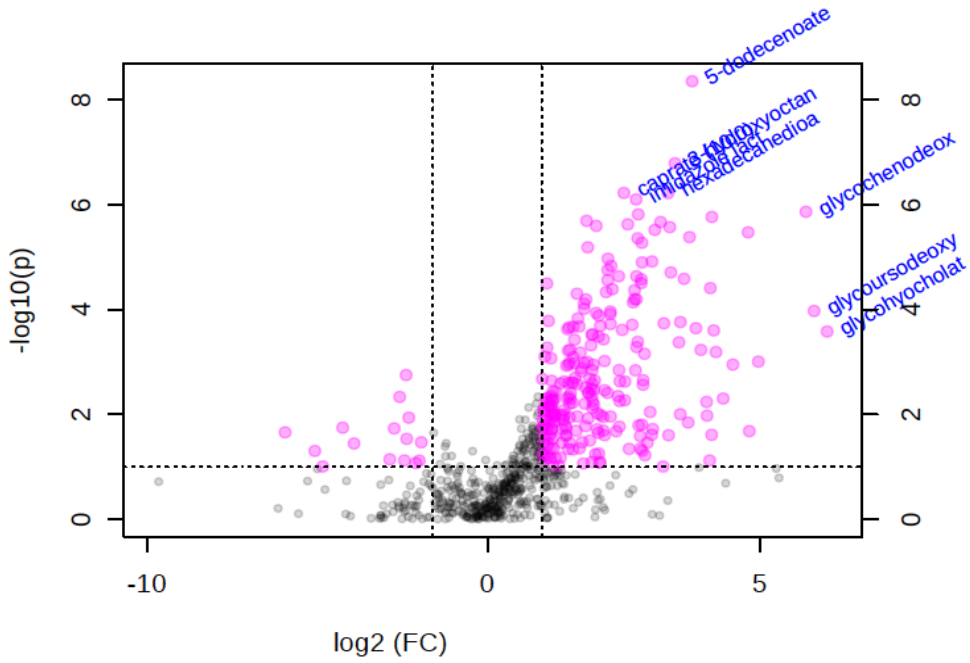


Rogers et al., *AJP lung* 2017

Does she only publish negative papers?

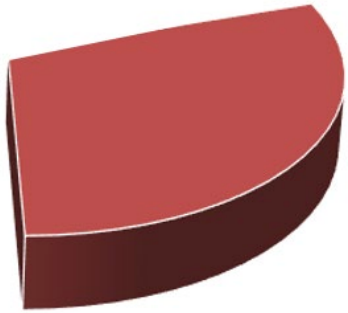
Does she only publish negative papers?





→ This data led to my first R01, studying edema that collects in HME filter fluid in ARDS

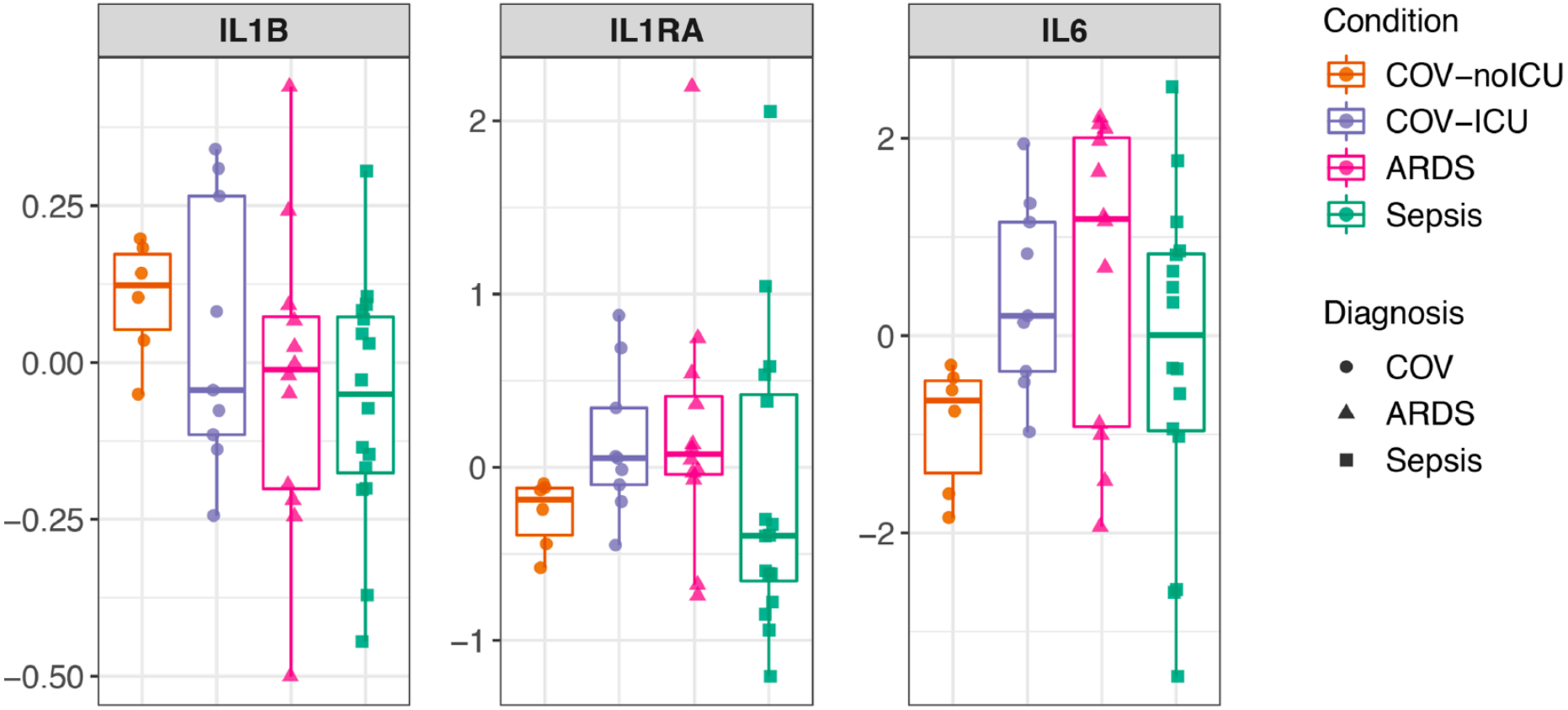
And then came COVID-19



Inflammation & immunomodulation in COVID-19 → numerous positive trials

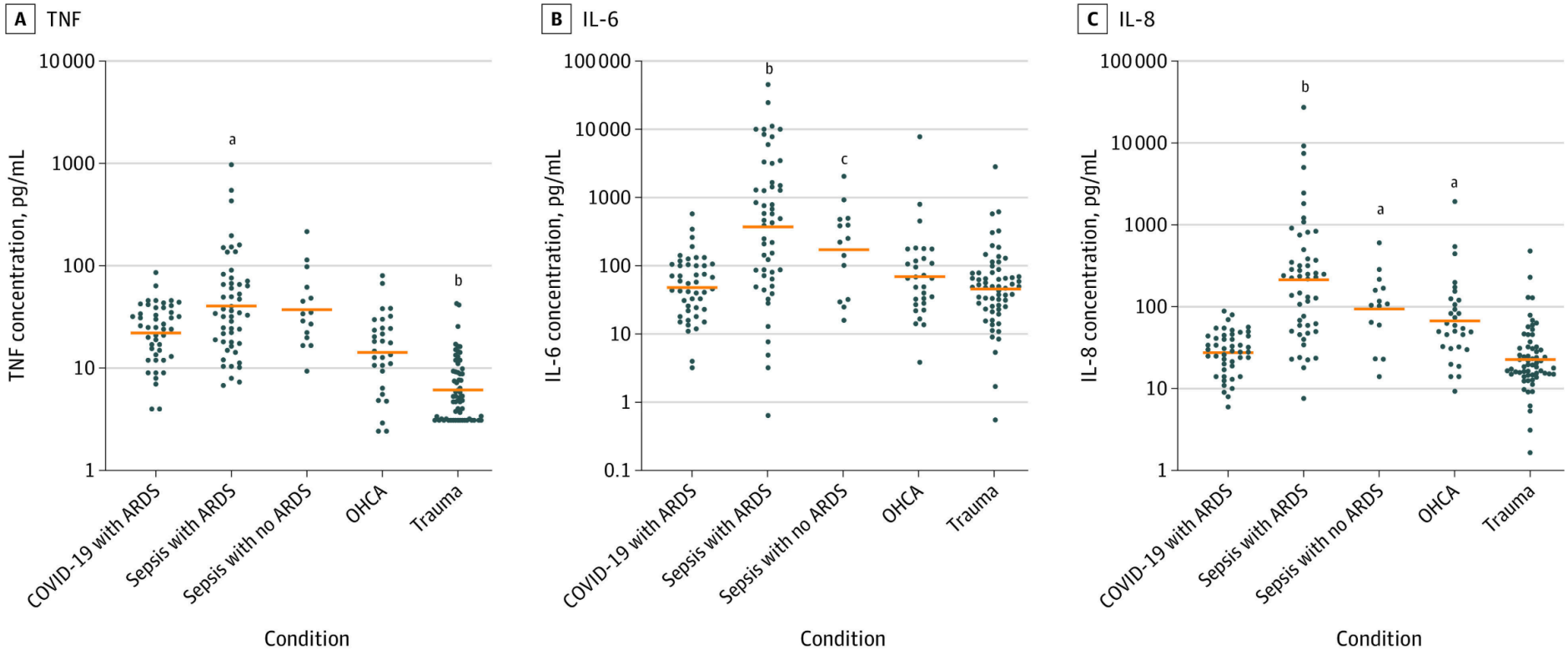
	Ad lib	Clinical trials	2021 Standard of care
Steroids	X	+	✓
Tocilizumab (anti-IL6)	X	+	✓
Plaquenil	X	-	
Baricitnib (JAK-inhibitor)	X	+	✓
Vitamin C	X	-	
Abatacept	X	+	

The biology wasn't different: Plasma biomarkers in COVID resemble non-COVID ARDS



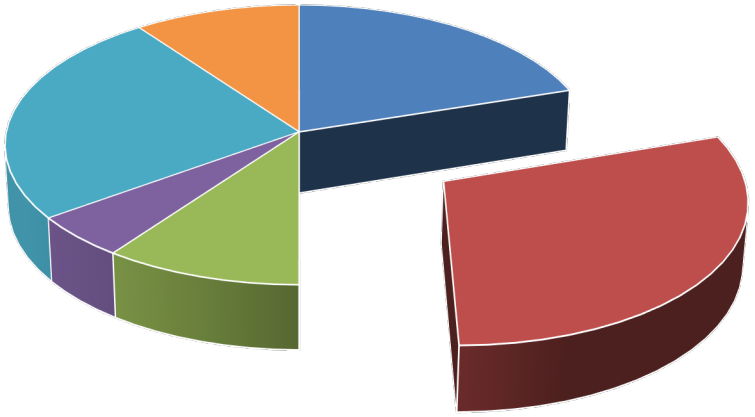
Wilson… Rogers *JCI Insight* 2020

Plasma biomarkers not markedly different in COVID

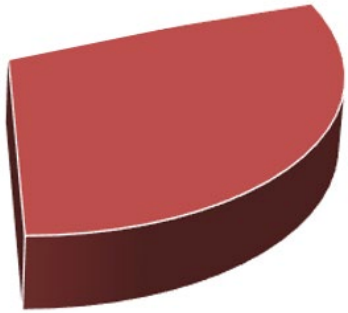


Kox et al. *JAMA* 2020

COVID-19 (at least in the early days) was a clean subphenotype

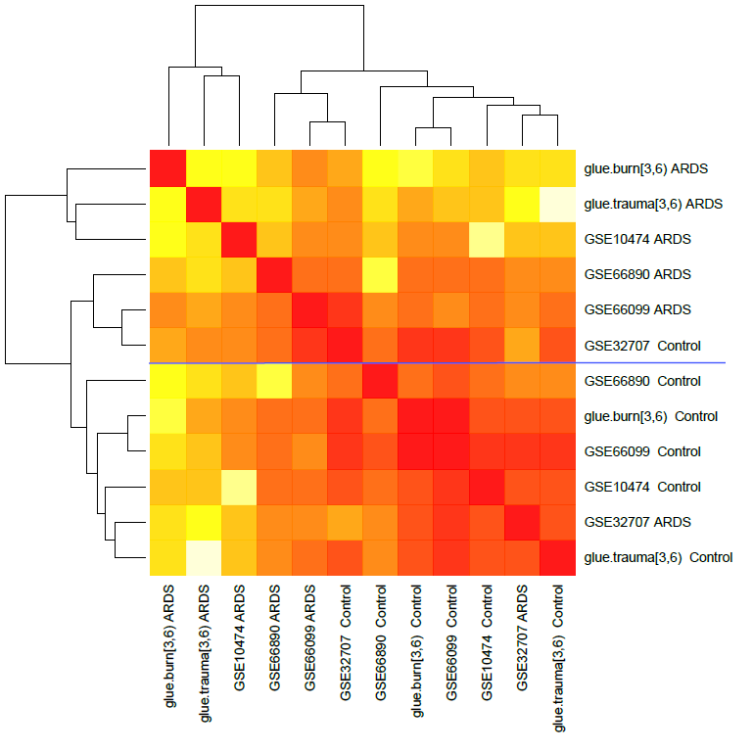


Can we use ‘omics to find meaningful non-COVID subsets?



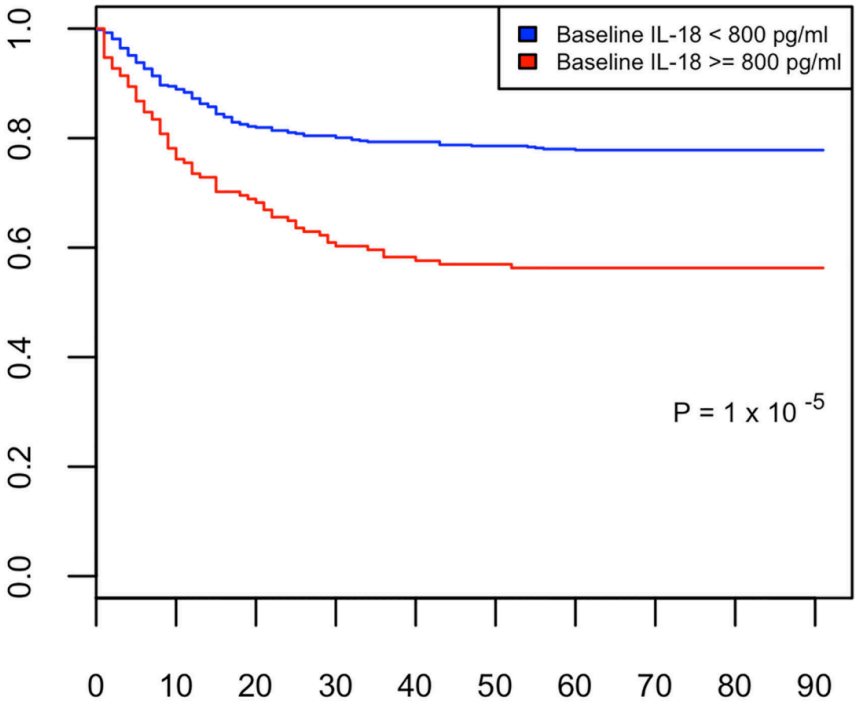
Plasma also shows clinically important subgrouping

Gene expression (again)



Sweeney et al., *CCM* 2018

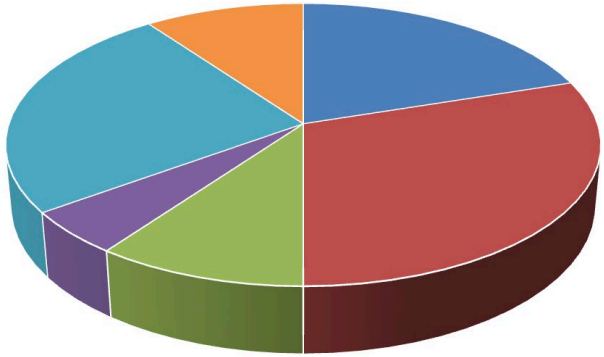
Inflammasome activation (IL18)

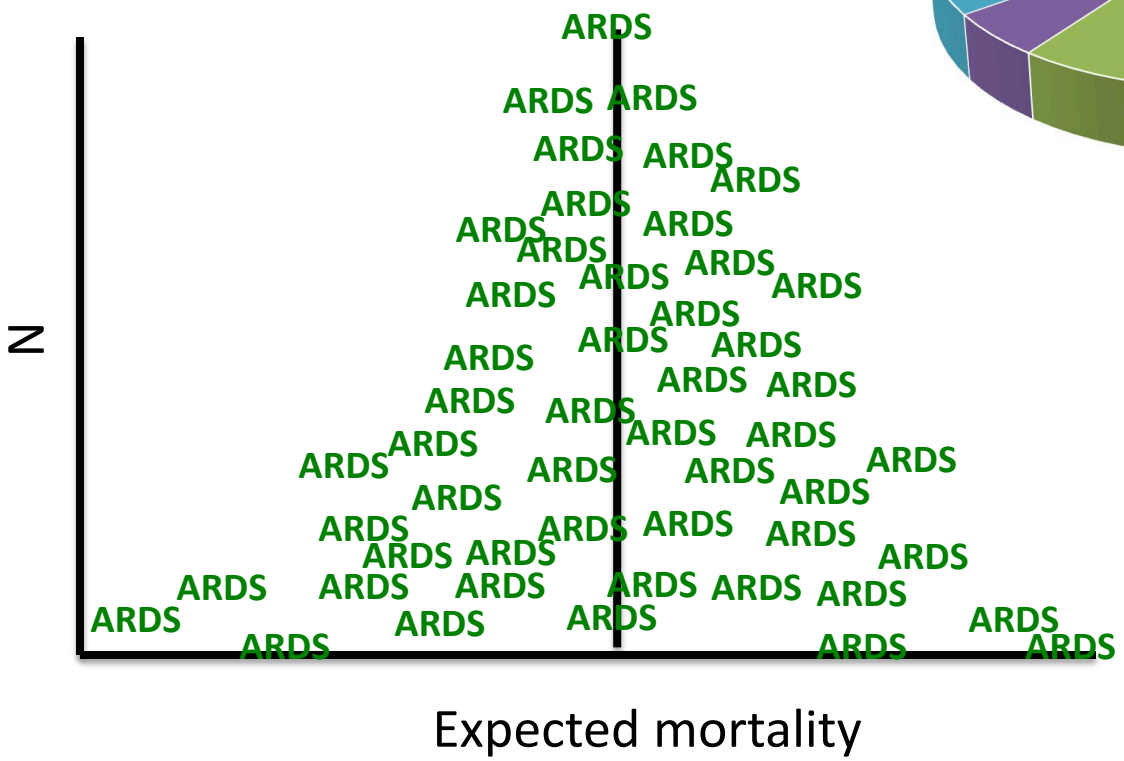


Rogers et al., *CCM* 2019

Boyle et al., *Crit Care* 2022

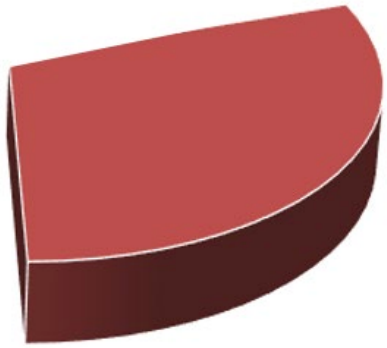
Latent Class Analysis : is ARDS homogeneous?

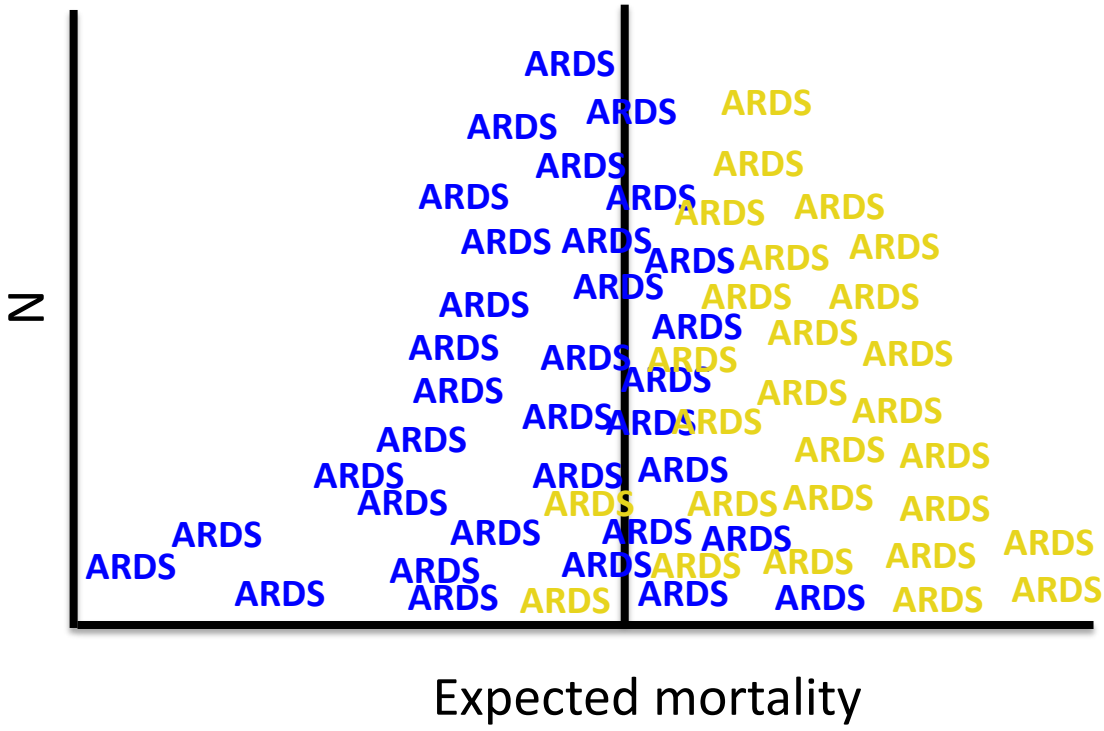




Work by C. Calfee, UCSF

Latent Class Analysis: or heterogeneous?

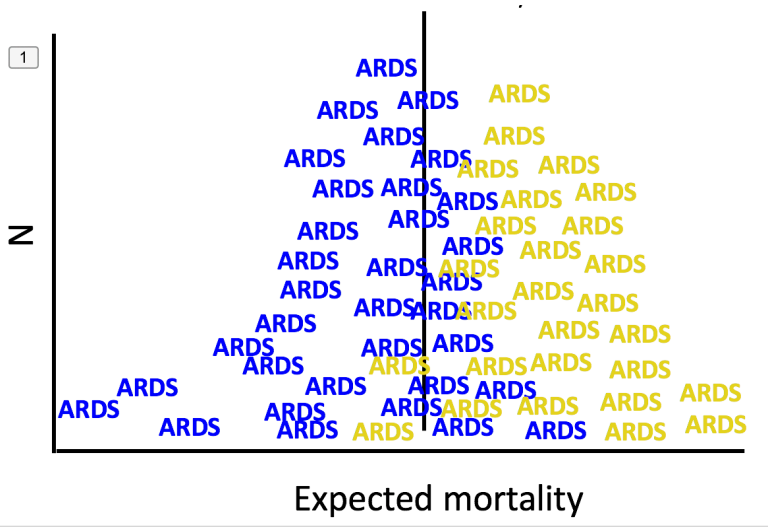




Work by C. Calfee, UCSF

Latent class analysis findings:

- In > 7 independent cohorts, ARDS is best characterized by 2 populations
- ~1/3 of patients in each population characterized as "hyperinflammatory"
- High IL-6, IL-8, and TNFrA cytokine levels are key drivers of hyperinflammatory class
- "Hyperinflammatory" ~ twice the mortality



Calfee CS et al, *Lancet Resp Med* 2014
Famous K et al, *AJRCCM* 2016

Response to therapy differs by class

ALVEOLI PEEP trial ($p_{interaction}$=.049)

	Mortality in low inflammation ARDS (n=404)	Mortality in high inflammation ARDS (n=145)
Low PEEP	16%	51%
High PEEP	24%	40%

HARP2 Statin trial ($p_{interaction}$=.14)

	Mortality in low inflammation ARDS (n=727)	Mortality in high inflammation ARDS (n=273)
Statin	17%	32%
Placebo	16%	45%

Calfee CS et al, *Lancet Resp Med* 2014
Calfee CS et al, *Lancet Resp Med* 2018

Limitations to using LCA

- De Novo LCA requires ~700 patients and >30 baseline variables
- Parsimonious model of 3-4 biomarkers Yes/No score works well for bacterial sepsis less so for viral (= most COVID-19) cohorts
- Critical illness cohorts (not all sepsis)
- Would need real-time measurement to enact in a clinical trial

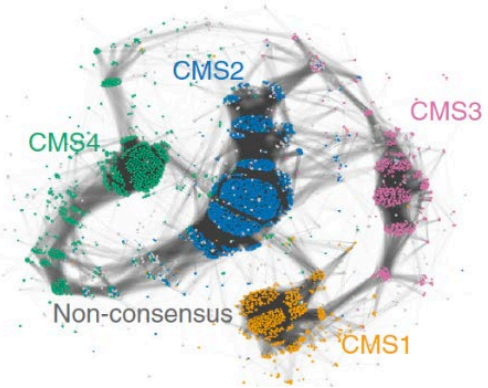
Gene expression: a window on sepsis biology, but no consensus on subtypes

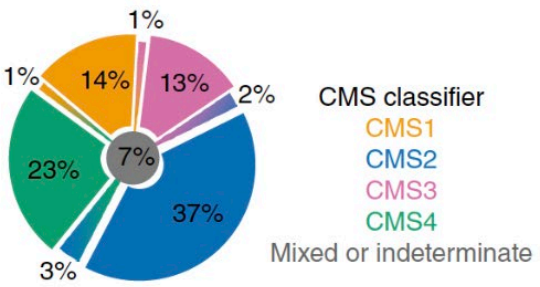
Endotype Schema	Endotype Number	Good Endotypes	Bad Endotypes
SRS	2	SRS2	SRS1
SRSq	3	SRS3	SRS1, SRS2 (intermediate)
Sweeney Endotypes	3	Adaptive	Inflammopathic, Coagulopathic
Yao Endotype Scores	3 Continuous Scores	Adaptive	Innate, Coagulopathic
SoM signature	4 Continuous Scores	SoM 3, 4	SoM 1, 2
Wong Endotypes	2 Endotypes	B (higher score)	A (lower score)
MARS Endotypes	4	MARS 3, 4	MARS 1, 2

Subspace consortium: is there unifying biology? Learning from colorectal CA

Colorectal CA biology:

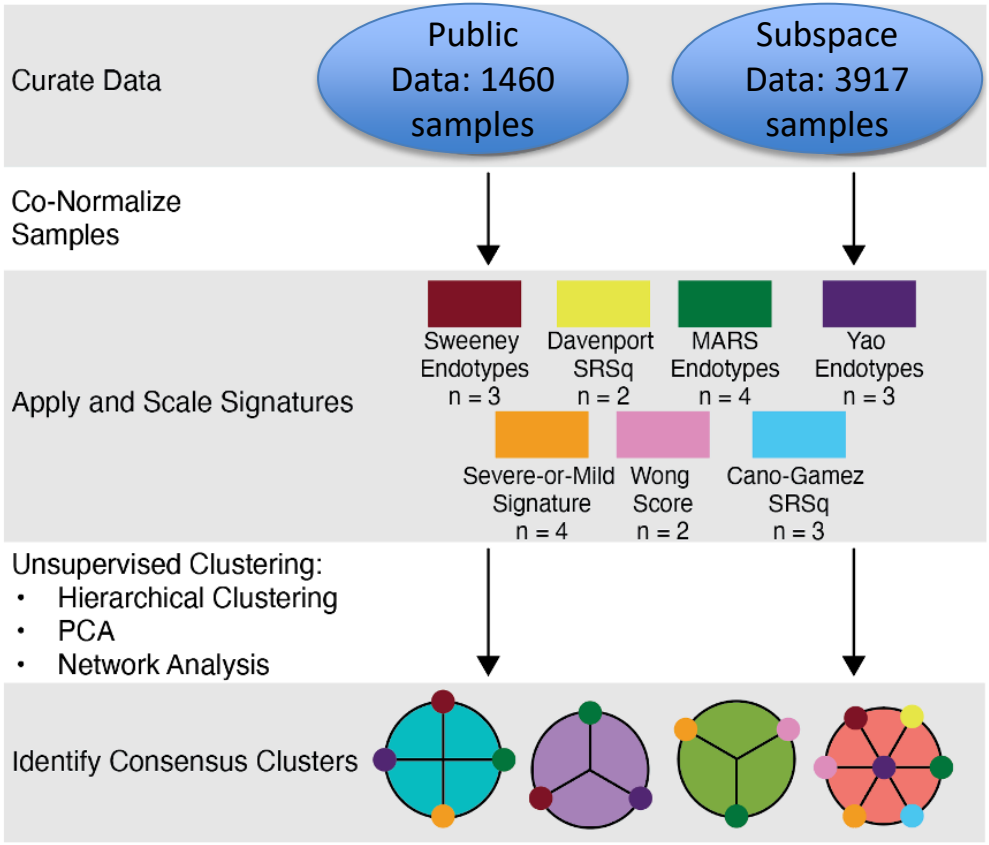
- 6 different clustering methods, range 3-6 clusters
- When >4000 samples available, vast majority cluster into 4 consensus clusters
- Cited >5000 times



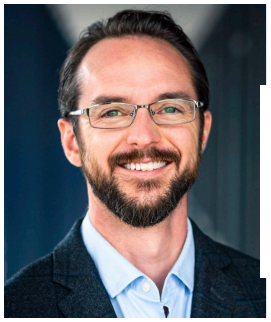


Guinney et al. *Nat Med* 2015

SUBSPACE Analysis Overview

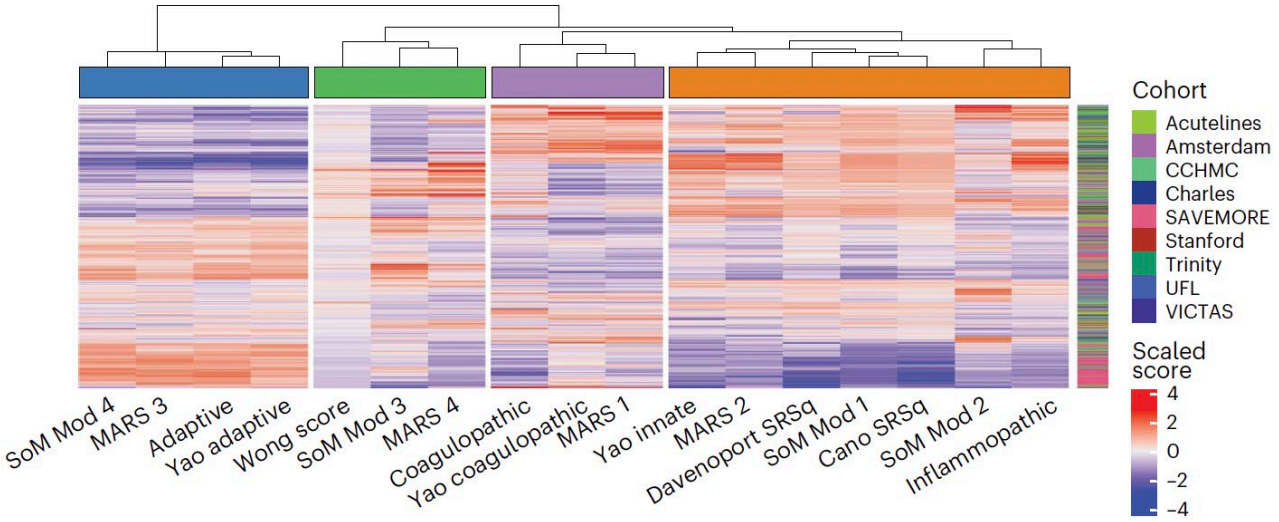


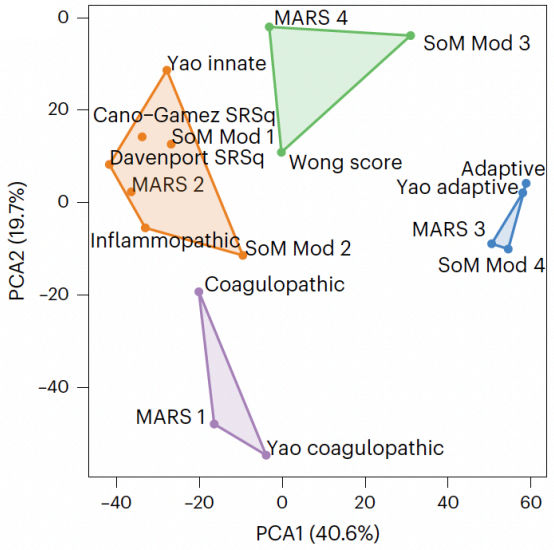
Institute	Sample no.	Patient characteristics
Acutelines	992	High acuity ED
Amsterdam UMC	1,071	Pneumonia, COVID-19
CCHMC	311	Pediatric sepsis
Charles university	38	Sepsis
SAVE-MORE	752	COVID-19
Stanford University	236	ICU
Trinity College	204	Sepsis
University of Florida	172	Sepsis, Trauma
VICTAS	141	Sepsis



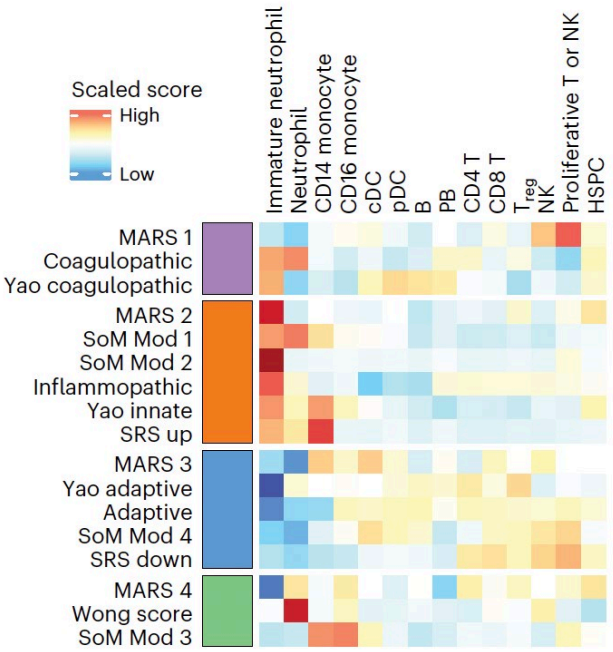
Moore et al. *Nat Med* 2025

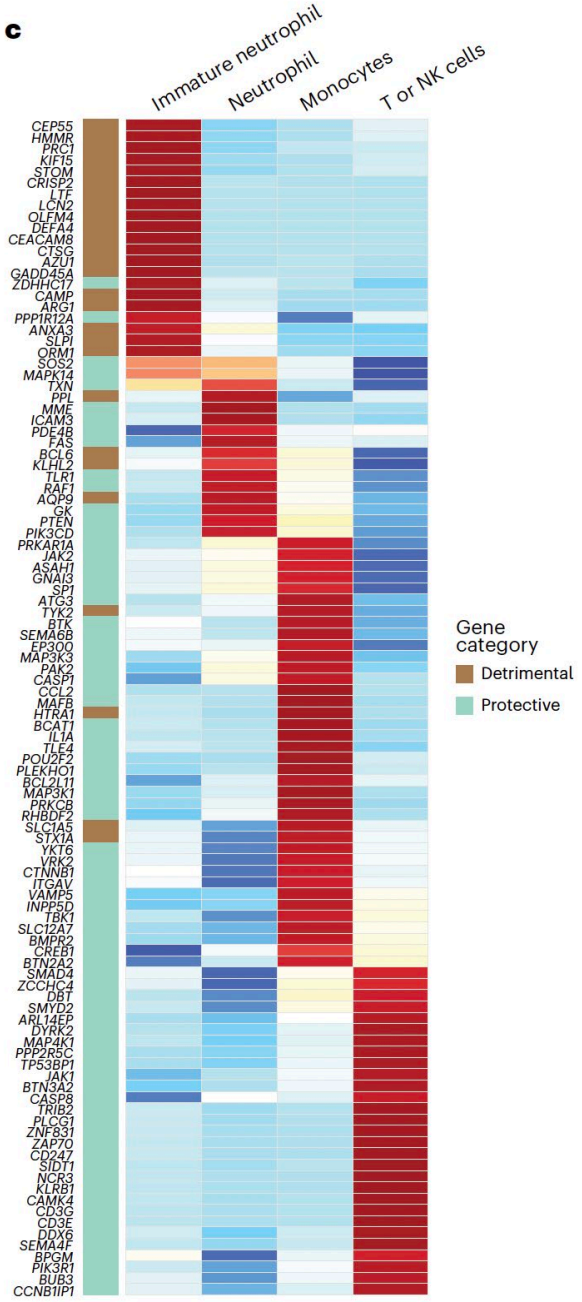
SUBSPACE consortium results:
All prior sepsis signatures identify the same biology





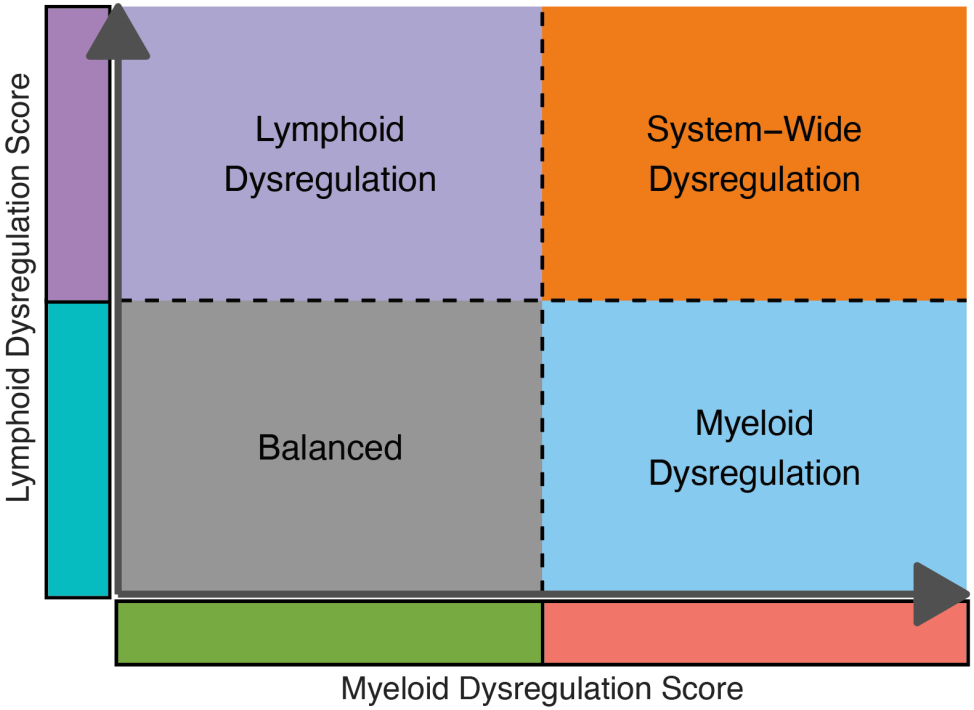
Biology underlying these clusters: myeloid and lymphoid dysfunction

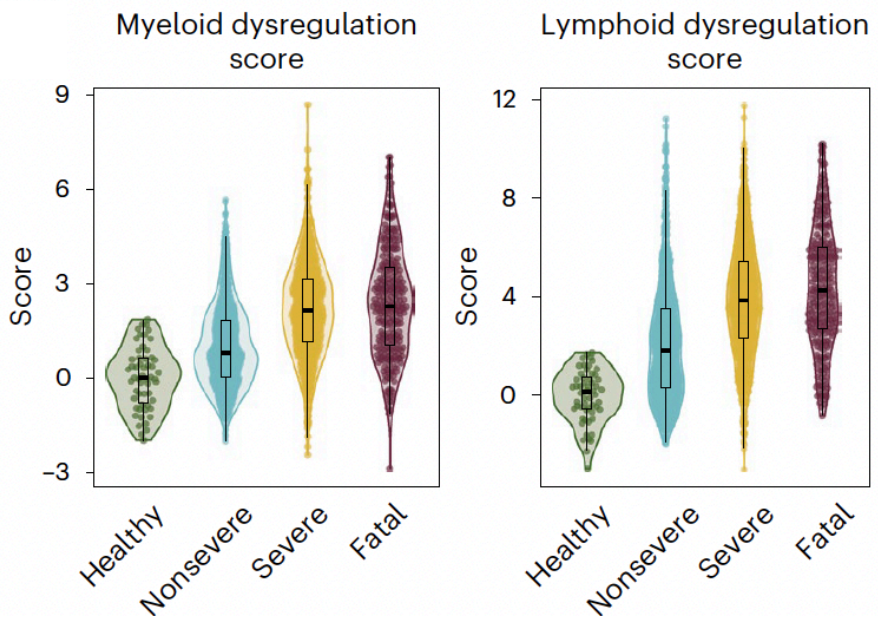




Moore et al. *Nat Med* 2025!

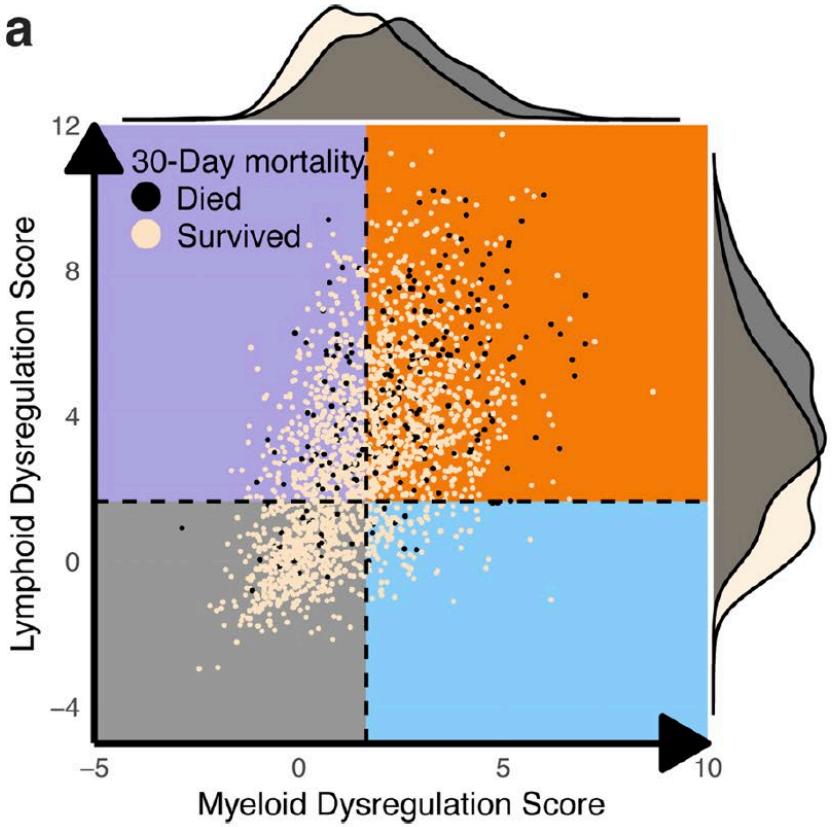
SUBSPACE consortium results: Quantification of Immune Dysregulation in Sepsis

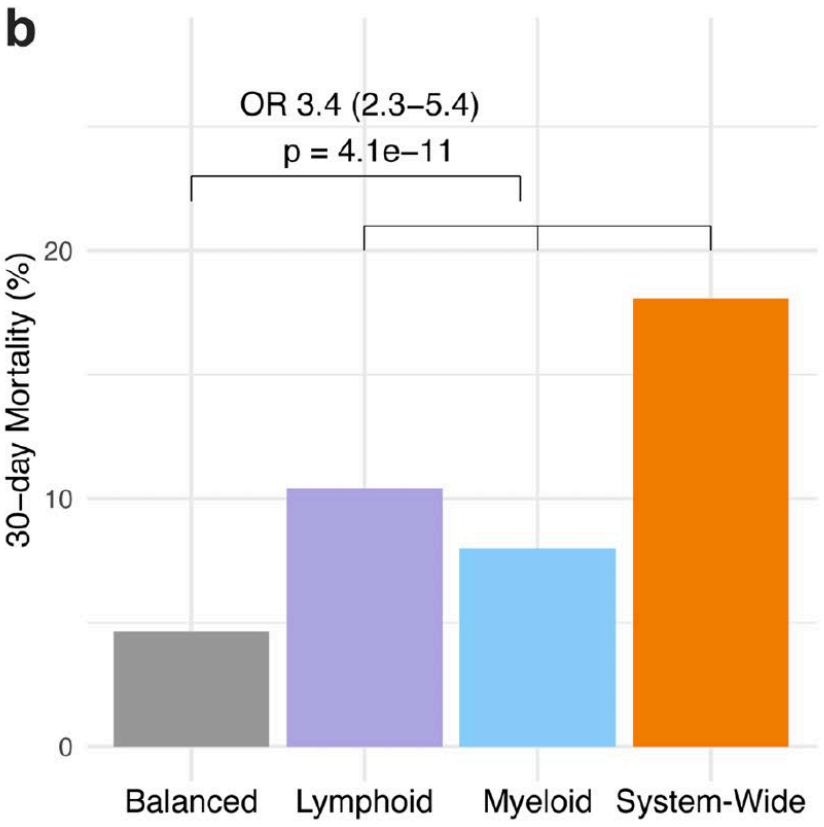




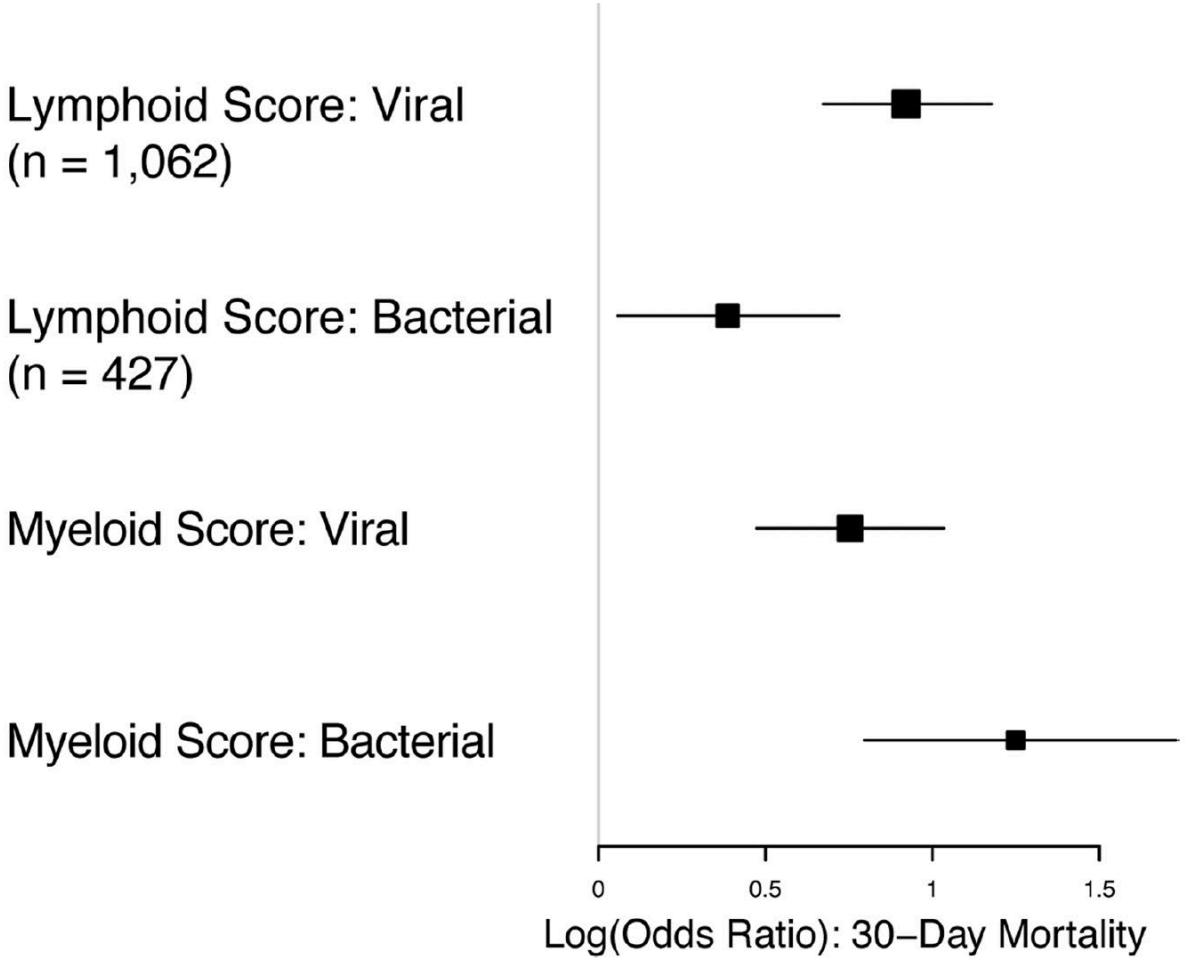
Moore et al. *Nat Med* 2025

This consensus framework identifies patients who die in SUBSPACE (n = 3917, 11 datasets)



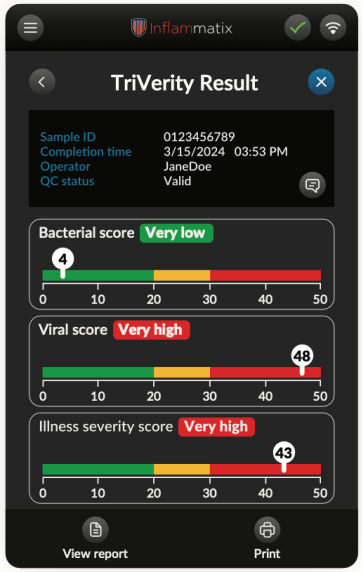


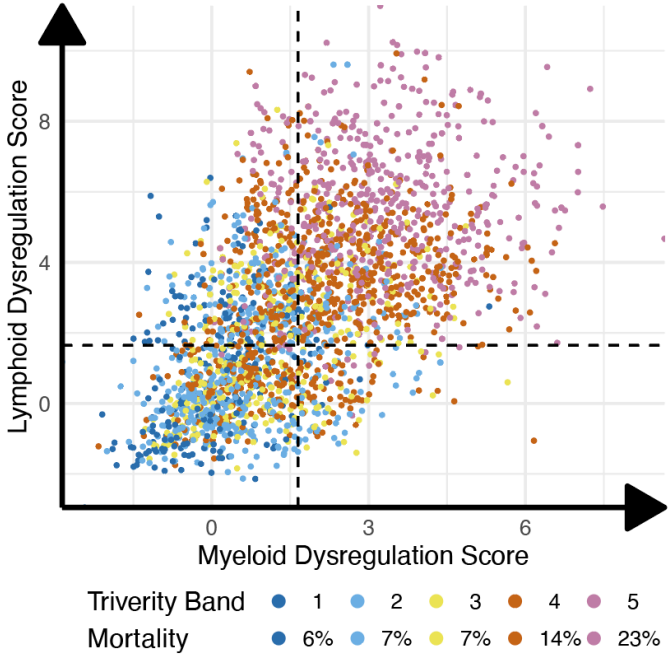
Dysregulation is important in both viral and bacterial infections



OK, cool biology but so what?

TriVerity is an FDA-cleared point of care (~30 min) RNA expression signature that correlates closely with this biology





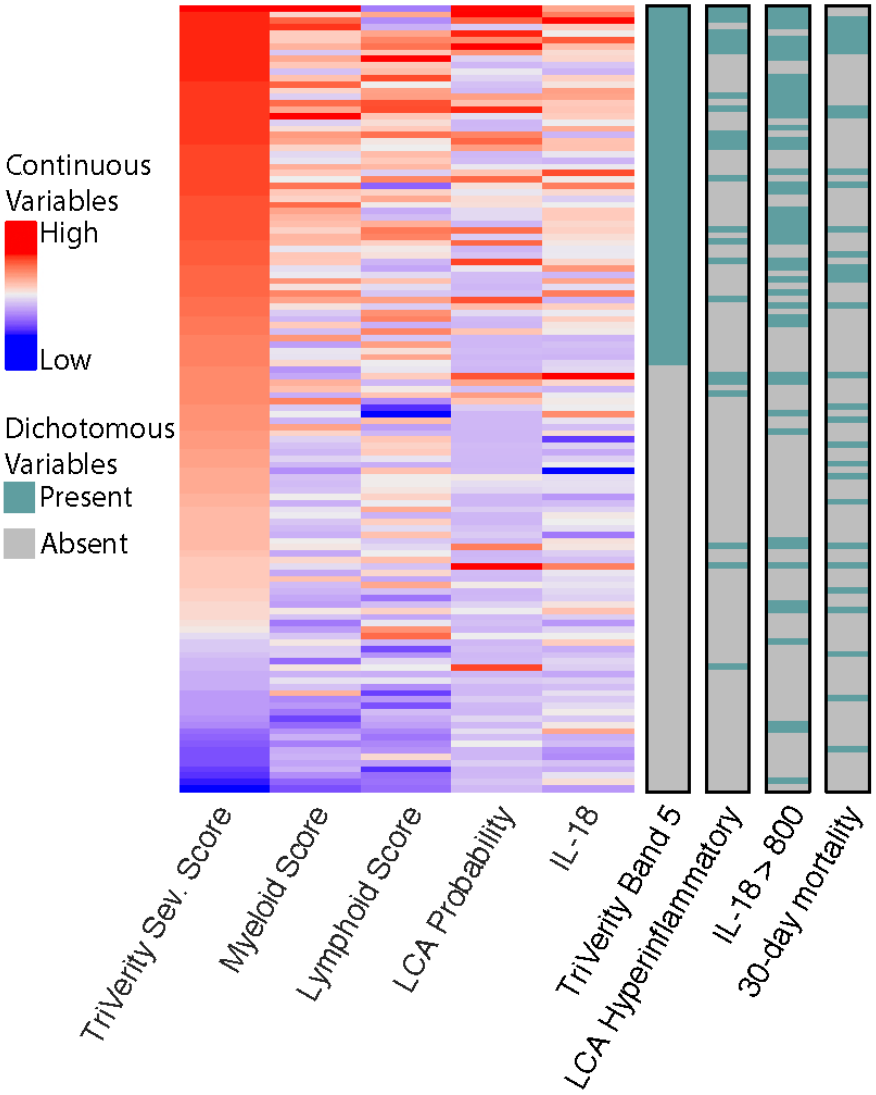
Conflicts of Interest

- None for me
- (But TriVerity is a spin-off from Stanford by my close collaborators!)

Purvesh Khatri

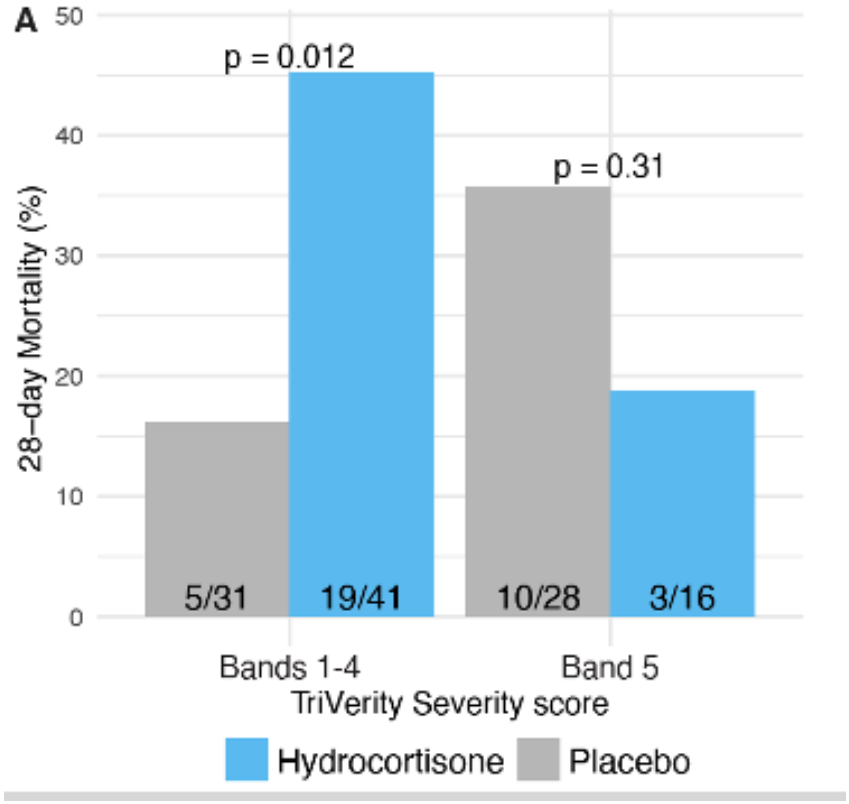
Tim Sweeney

TriVerity correlates closely with LCA & other high-risk sub-phenotypes

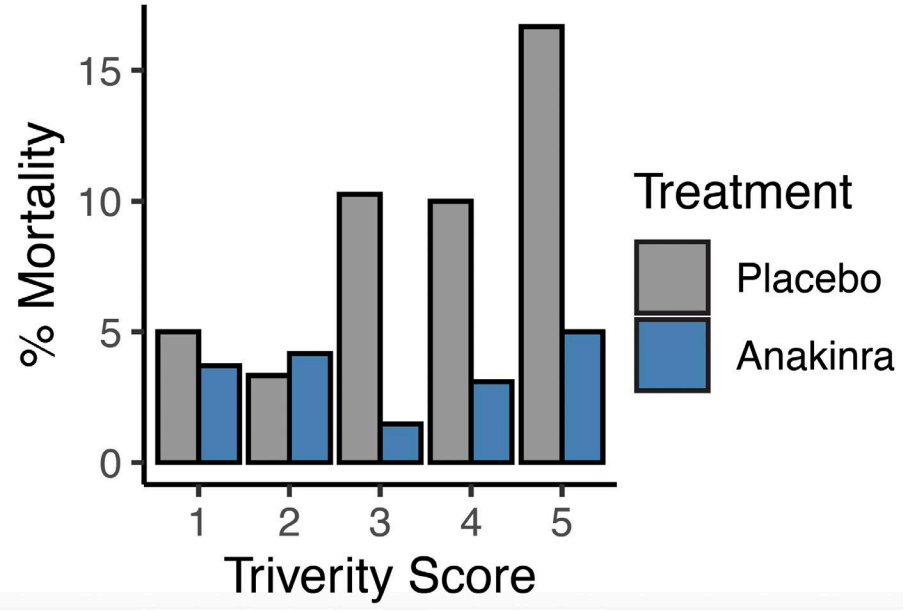


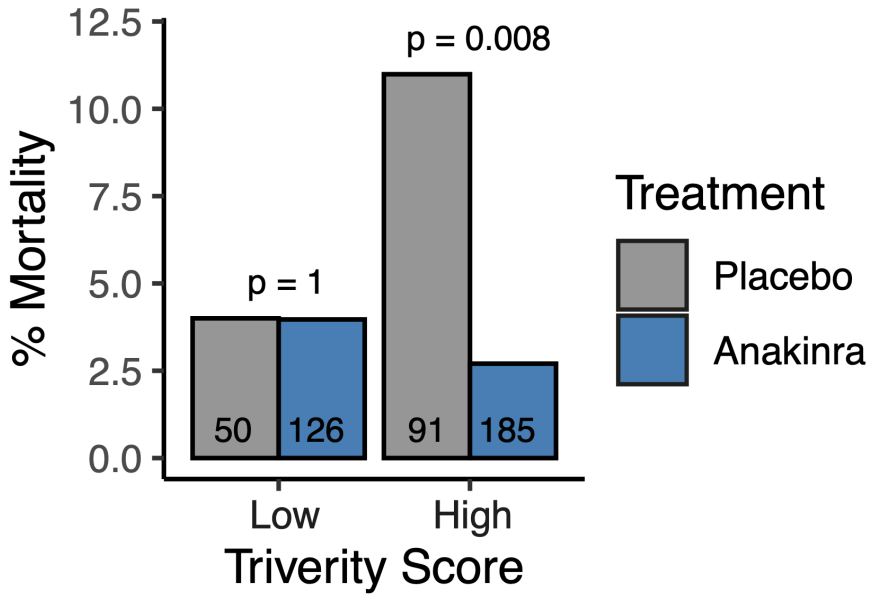
TriVerity score & differential response to steroids in VANISH trial

VANISH Trial (Hydrocortisone)



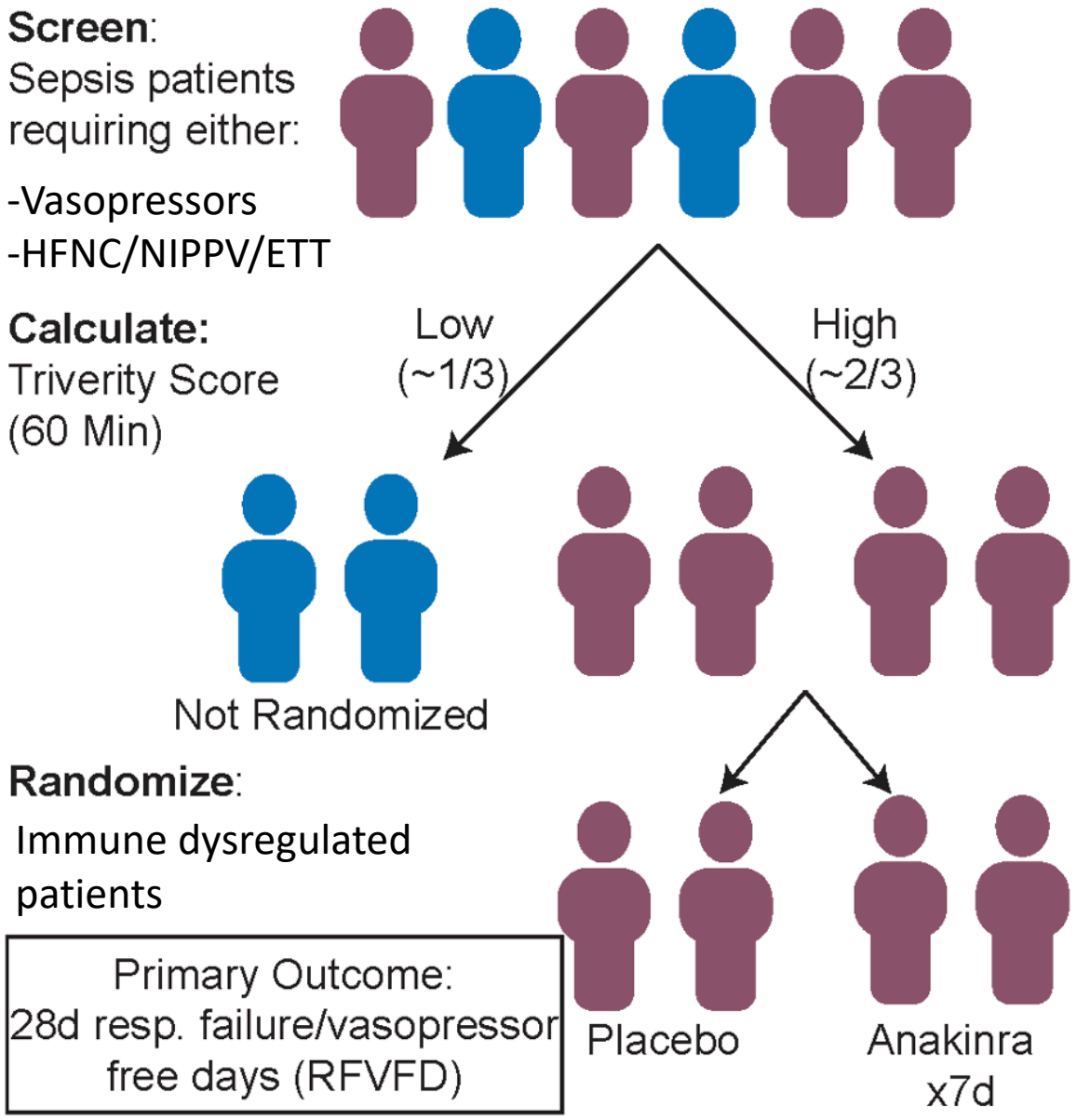
TriVerity identifies patients who benefit from Anakinra in the SAVE-MORE COVID-19 trial





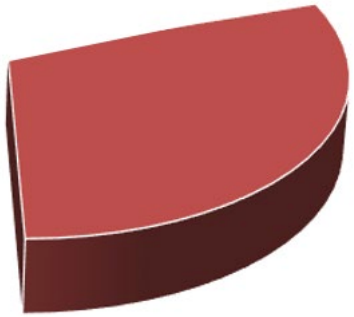
The ASPIRE Trial (*UG3/UH3 to NIH*)

The ASPIRE Trial



Conclusion: Personalized medicine in critical care: are we finally there?

- We are closer than we've ever been!
- Our syndromic definitions in crit care got us a LONG way in ICU care
- Bedside 'omics-based subsetting are coming to clinical trials near you



California Thoracic Society
ATS Chapter Serving California and Arizona

Misclassification in ARDS really matters

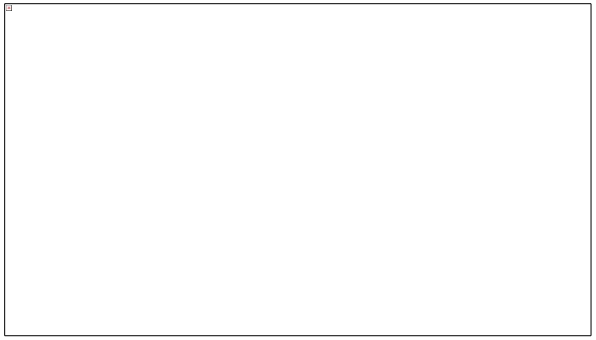
- Inter-rater CXR interpretation varies from κ ~.4-.9

K = 1

	ARDS	Not ARDS
ARDS	50	
Not		50

K = .6

	ARDS	Not ARDS
ARDS	40	10
Not	10	40

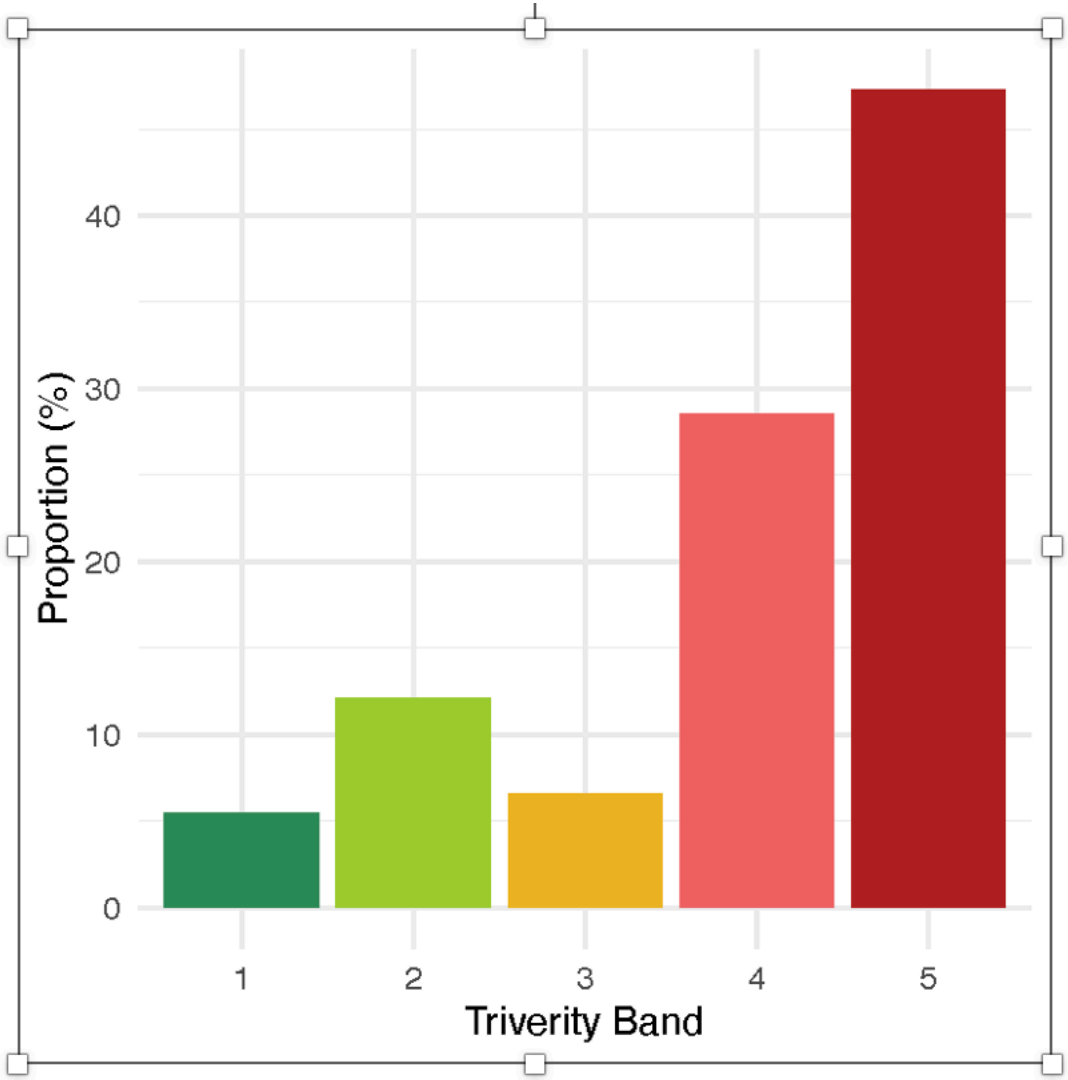


K = .4

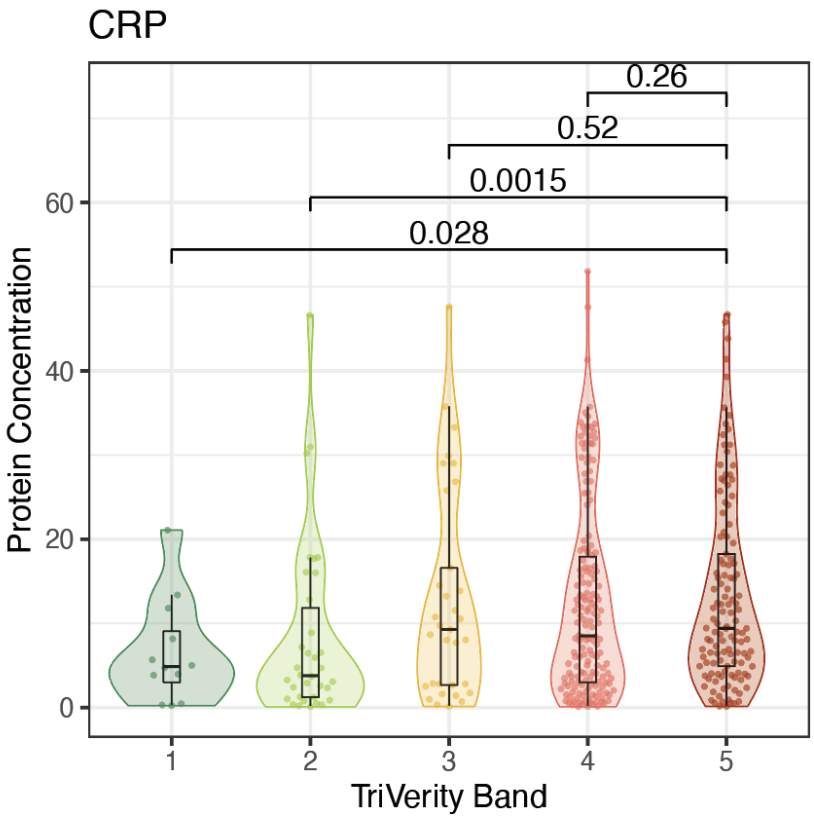
	ARDS	Not ARDS
ARDS	40	20
Not	10	30

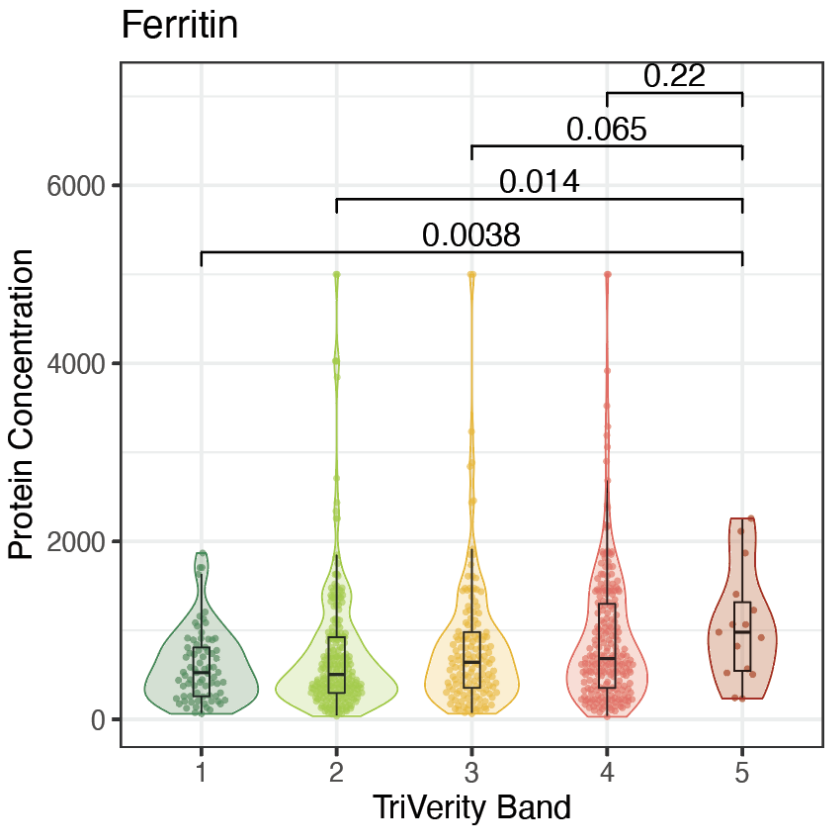
Rubenfeld et al. *Chest* 1999

The Stanford ICU biobank is predominantly Band 5, however there is variation



This biology is not readily apparent with current clinical markers





This variation is not clinically apparent

	Band 1	Band 2	Band 3	Band 4	Band 5
WBC	15 (15, 15)	12 (6, 15)	13 (11, 19)	**14 (11, 18)**	**15 (9, 22)**
APACHE II	18 (16, 19)	20 (14, 26)	13 (12, 15)	**20 (11, 26)**	**20 (14, 32)**
ARDS (%)	0%	12%	11%	**32%**	**39%**
Intubated	47%	48%	37%	**68%**	**62%**
APACHE II	18 (16, 19)	20 (14, 26)	13 (12, 15)	**20 (11, 26)**	**20 (14, 32)**
D30 Mortality (%)	6.7%	8%	11%	**20%**	**28%**

Band distribution: SAVE-MORE vs VICTAS/VANISH