

Diverse Voices in STEM

September 7, 2021



Carleen Sabusap, PhD
Research Assistant Professor
Vanderbilt University Medical Center

Views expressed do not represent Vanderbilt University Medical Center

Or Any Other Biologists Who Wish They Were Better Chemists

Or the Entire State of Florida

Or All of the Filipinx people who love making lumpia

Or the Many Many Scientists Who are Also Artists

My views represent my experiences, my heritage and
the village of people who have supported me



Before we talk about me let's talk about you



*Respond at pollev.com/carleensabus243
Or text carleensabus243 to 22333 once to join*



When poll is active, respond at pollev.com/carleensabus243

Text **CARLEENSABUS243** to **22333** once to join

What is your age?

Under 18

18-22

22-30

30-55

55+



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Text **CARLEENSABUS243** to **22333** once to join

Are you currently involved in STEM?

I am majoring in STEM

I am thinking about majoring in STEM

I am majoring in something other than STEM

I work in STEM

I would like to work in STEM

I do not work in STEM

None of the above



When poll is active, respond at pollev.com/carleensabus243

Text **CARLEENSABUS243** to **22333** once to join

What is your favorite holiday and why is it Halloween?

Halloween, obviously

Christmas

Thanksgiving

Independence Day

Easter

Hanukkah

Chinese New Year

Ramadan and Eid al-Fitr

Diwali

New Years

Other



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How does STEM make you feel in one word?



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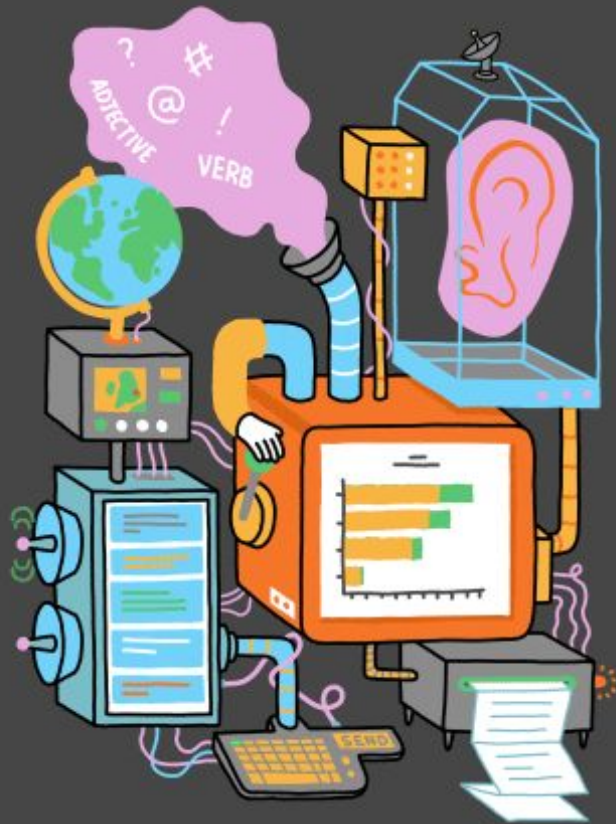
Start the presentation to see live content. For screen share software, share the entire screen. Get help at pollev.com/app

Share your future goals (grad/medical school, etc) and upvote entries you are pursuing

Top



Thanks for your data!





How to Become a Scientist in 100 Quick & Easy Steps



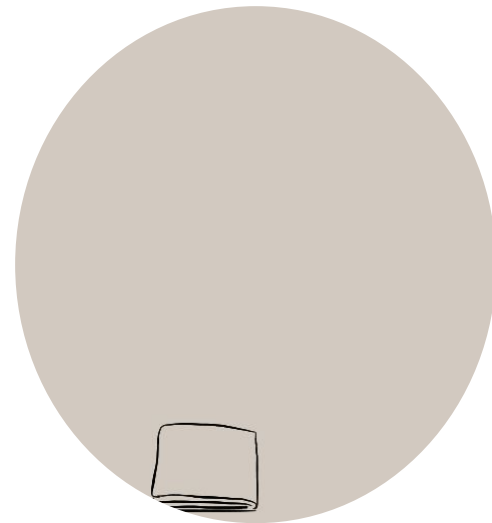
Becoming a Scientist is
One of
the Hardest
Most Complicated
Riskiest Things You Can Ever Do



Books to Bugs to Biopsies



Diversity in STEM



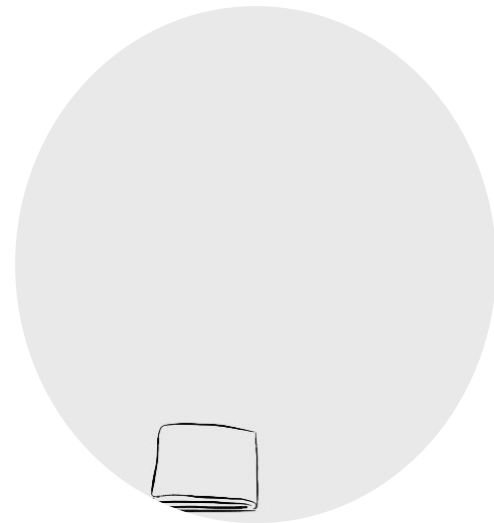
Diversity in Healthcare



Books to Bugs to Biopsies



Diversity in STEM



Diversity in Healthcare



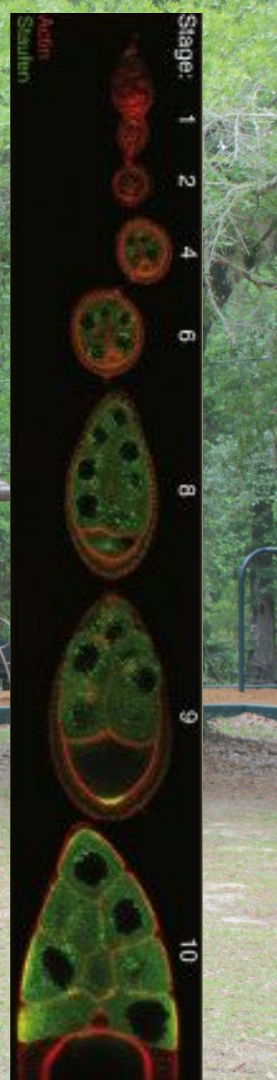
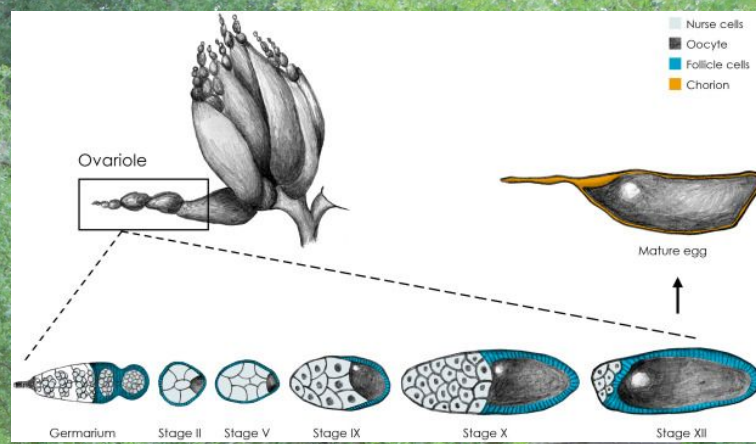
Research Faculty



20??







2010-2013

Deng Laboratory



University of Alabama at Birmingham

Graduate Biomedical Sciences

- Biochemistry and Structural Biology
- Cancer Biology
- Cell, Molecular, and Developmental Biology
- Genetics, Genomics, and Bioinformatics
- Immunology
- Microbiology
- Neuroscience
- Pathobiology and Molecular Medicine



The Pathobiology & Molecular Medicine PhD Program at the University of Alabama at Birmingham

Rotation 1: **Maurizio Grimaldi MD, PhD**

Neuropharmacology (Southern Research Institute)

Differentiation of Glioblastoma Cells

Rotation 2: **Selvarangan Ponnazhagan, PhD**

Pathology

Molecular Switch Between Adipocytes & Osteoblasts

Rotation 3: **Eddy Yang, MD, PhD**

Radiation Oncology

Optimizing chemotherapeutics and radiation therapy dosage for breast cancer treatments

Rotation 4: **Eric Sorscher, MD**

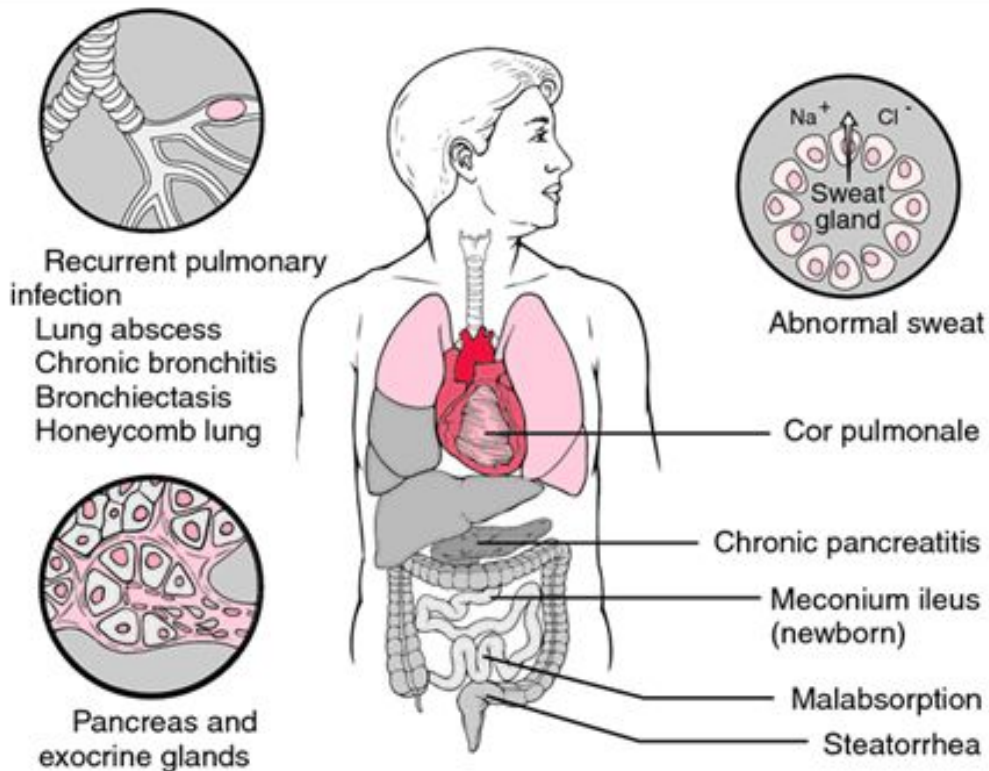
Cystic Fibrosis Research Center

Characterization of Rare Disease Causing Mutations

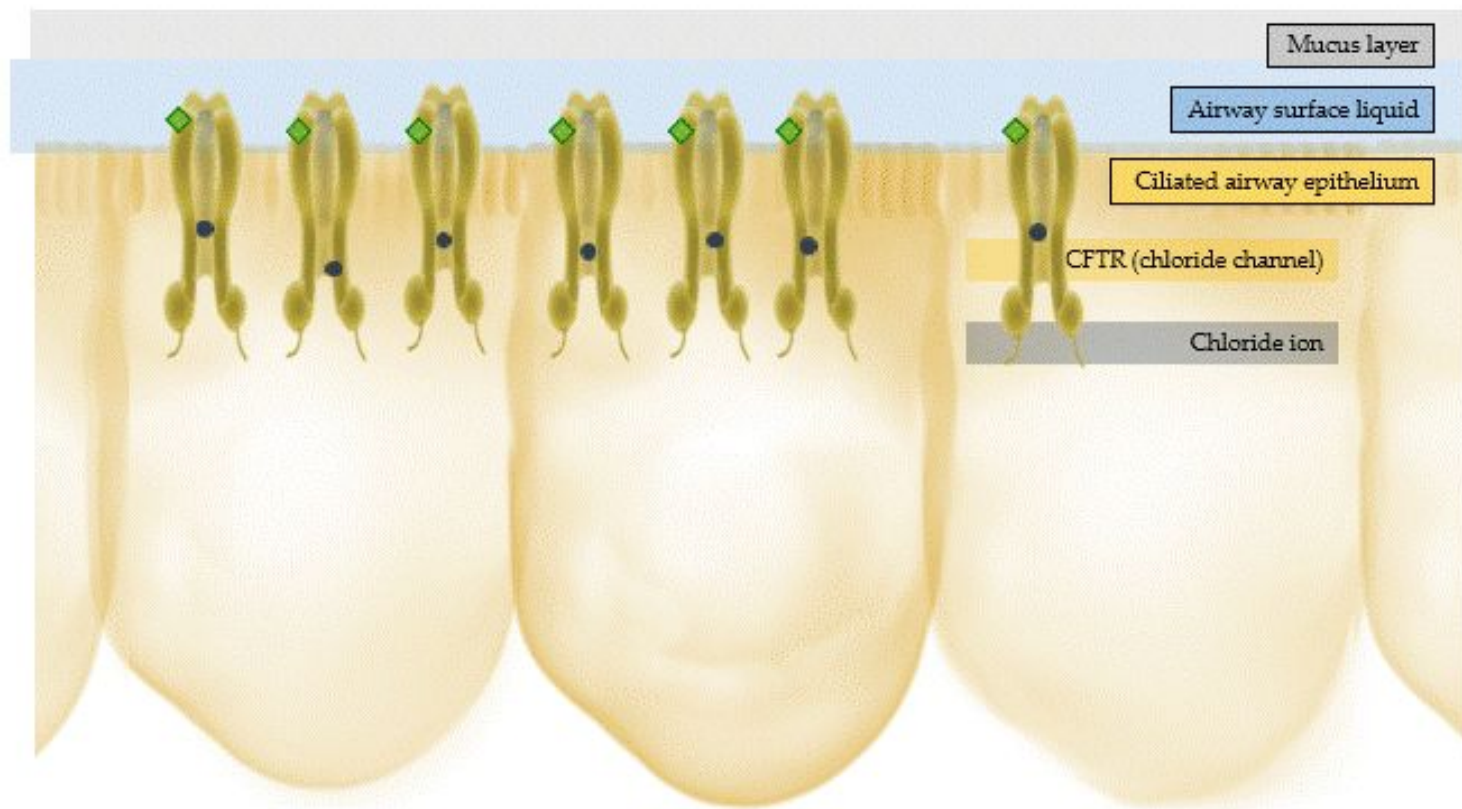


My mentor at I at graduation in 2018

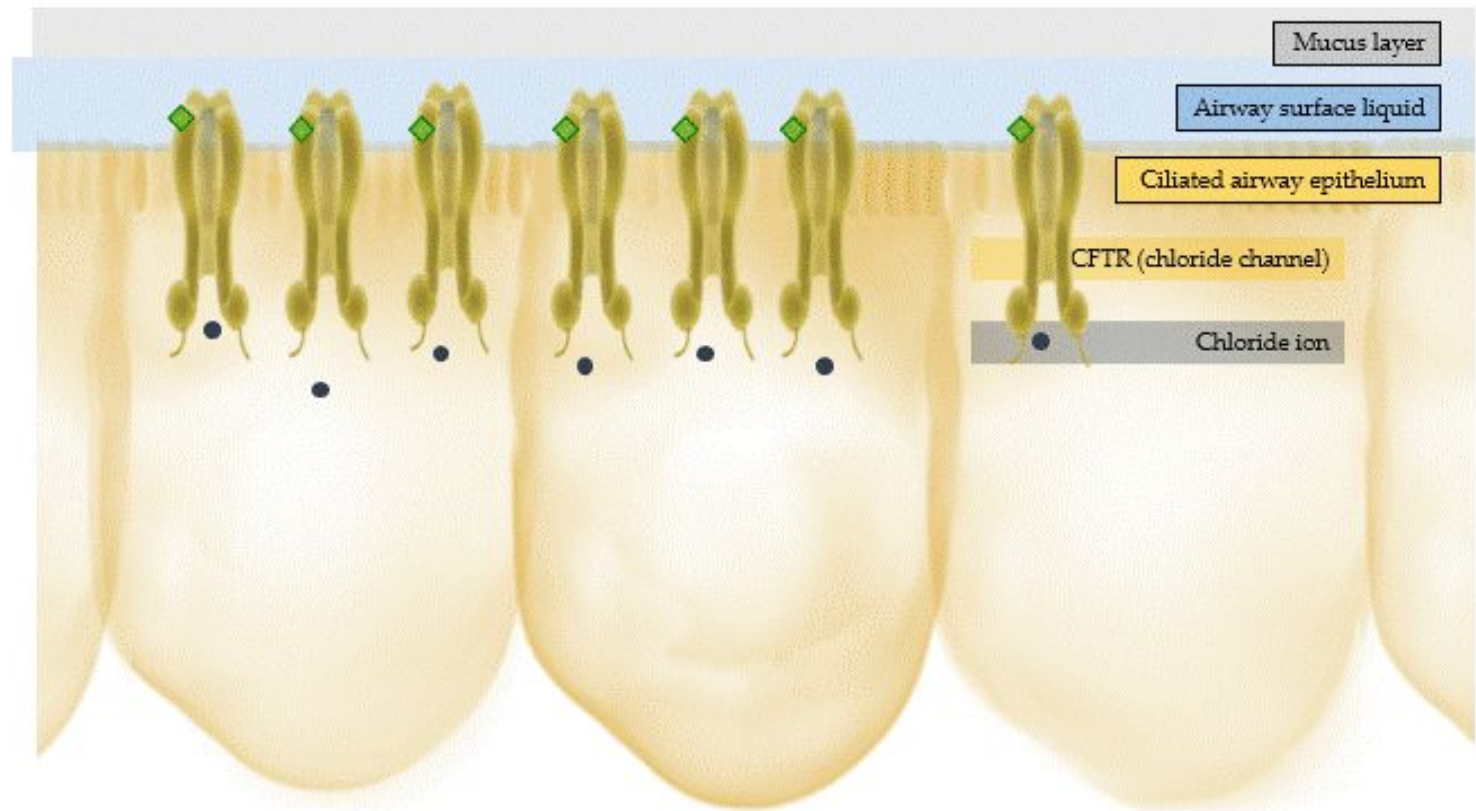
Clinical Features of Cystic Fibrosis



Normal CFTR Function

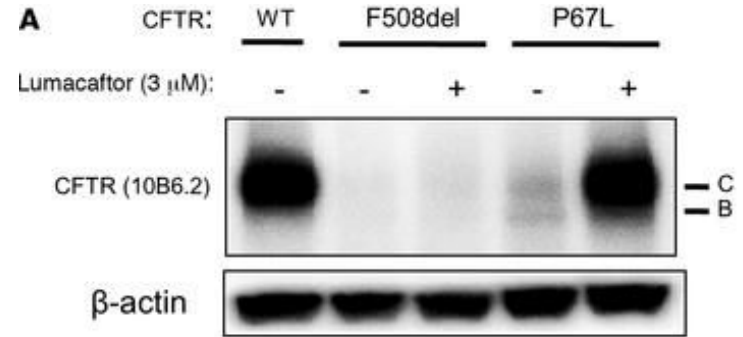
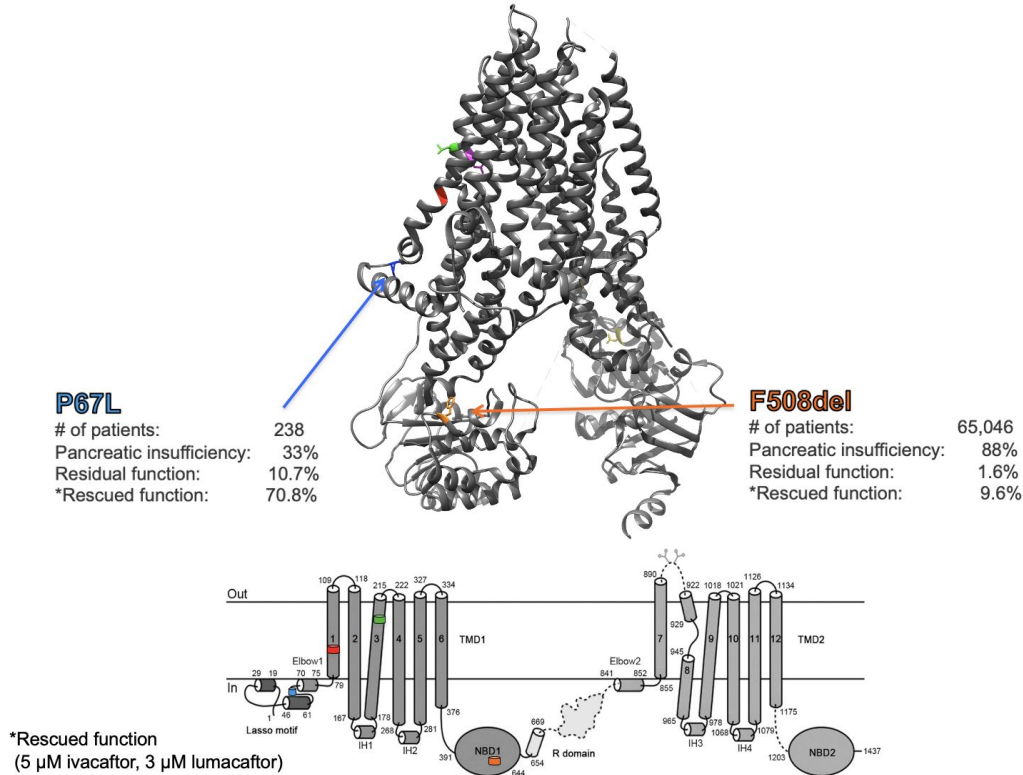


Normal CFTR Function



Patients with cystic fibrosis inherit genetic mutations that cause varying levels of sickness

Those differences in one gene affect whether or not a patient responds well to medicine





Tom @TheJellyTom · Jul 3



@cftrust **#Orkambi** of course! It's nice to maybe be able to think about a 40th Birthday!



2



5



[View conversation](#)



Ariella @ariellapearl · Jul 7

truly happy for everyone that can get **#Orkambi**... but i can't help but be overwhelmed w/ disappointment that i do not qualify for it



1



4



2013-2018

Sorscher Laboratory

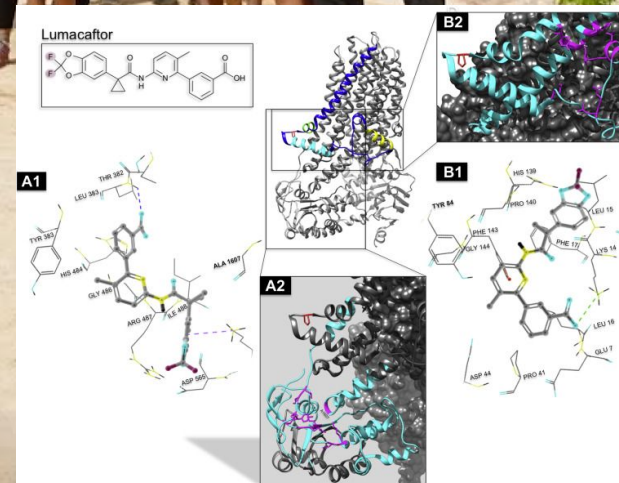
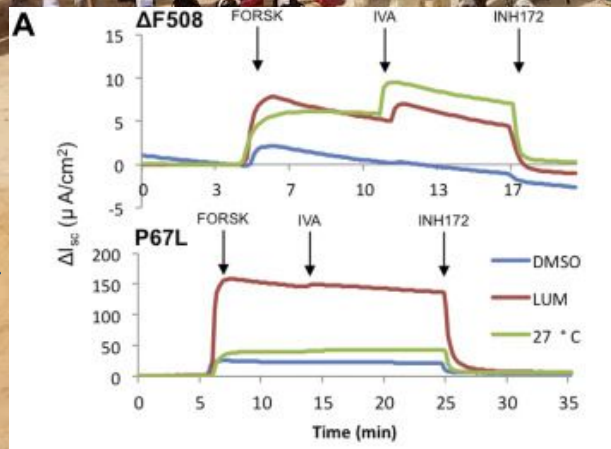


UAB

THE UNIVERSITY OF
ALABAMA AT BIRMINGHAM



EMORY
UNIVERSITY



Patients with cystic fibrosis inherit genetic mutations that cause varying levels of sickness

Those differences in one gene affect whether or not a patient responds well to medicine

A

L206W

of patients: 331
Pancreatic insufficiency: 20%
Residual function: 7%
*Rescued function: 70.7%

G85E

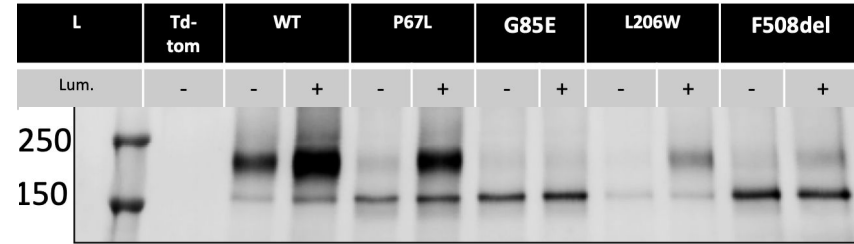
of patients: 584
Pancreatic insufficiency: 78%
Residual function: 0.5%
*Rescued function: 0.7%

P67L

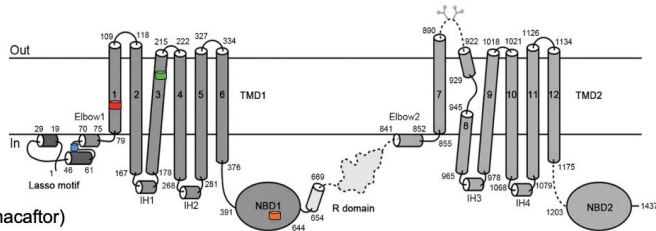
of patients: 238
Pancreatic insufficiency: 33%
Residual function: 10.7%
*Rescued function: 70.8%

F508del

of patients: 65,046
Pancreatic insufficiency: 88%
Residual function: 1.6%
*Rescued function: 9.6%



B



*Rescued function
(5 μ M ivacaftor, 3 μ M lumacaftor)



2018-2021

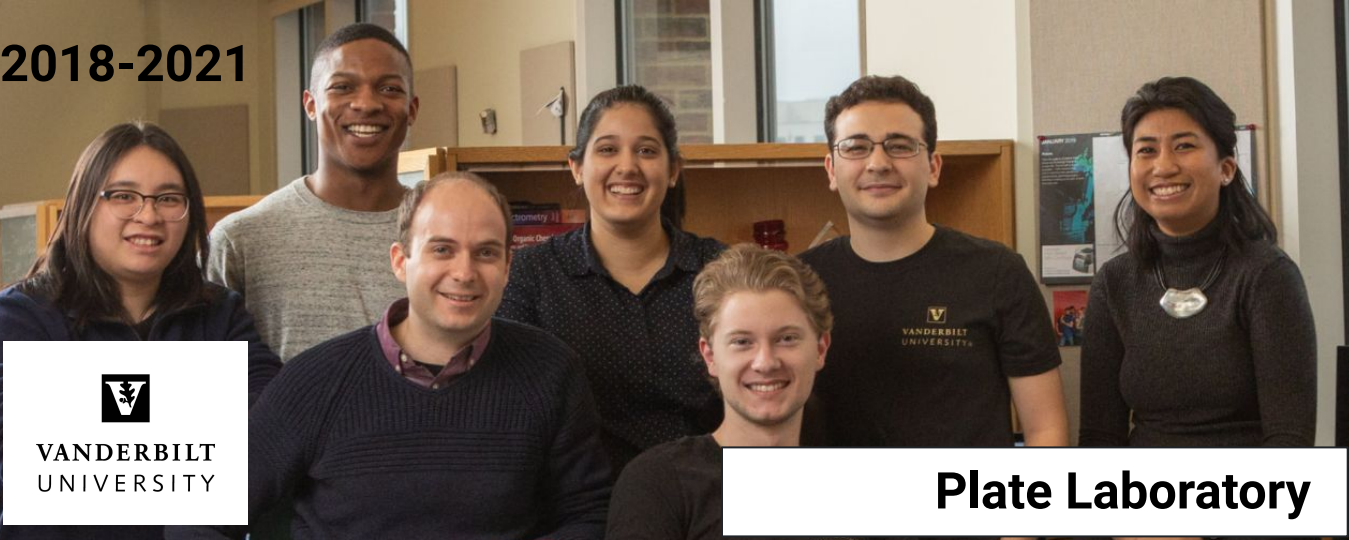
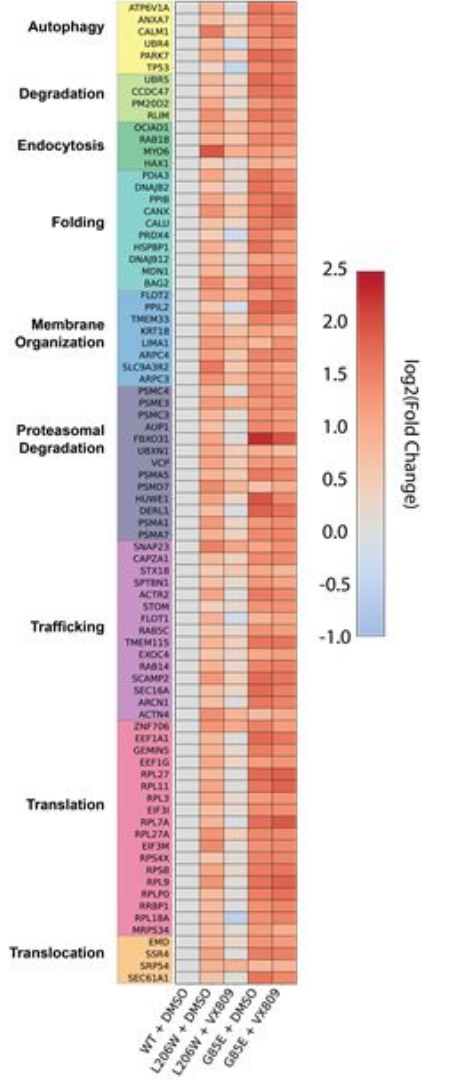
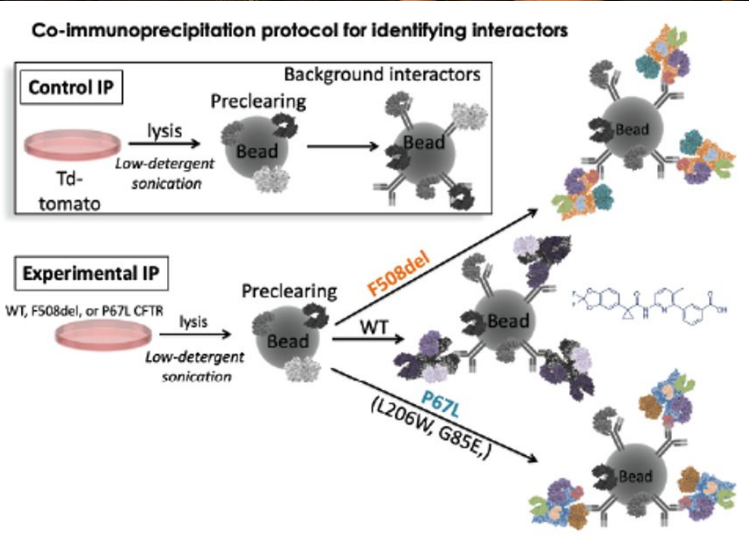


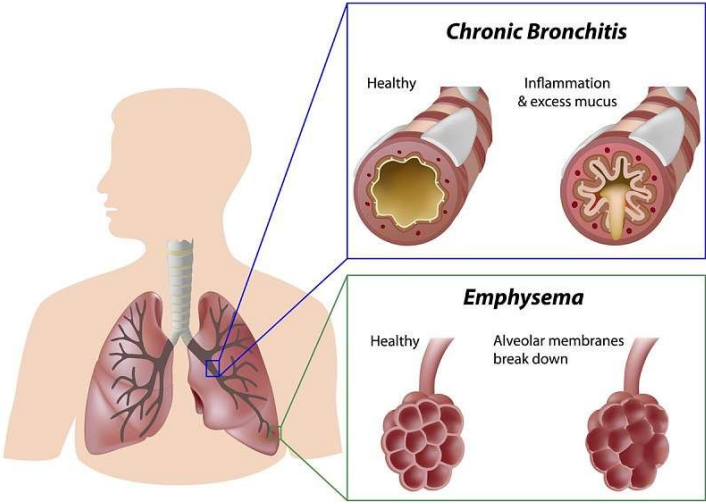
Plate Laboratory



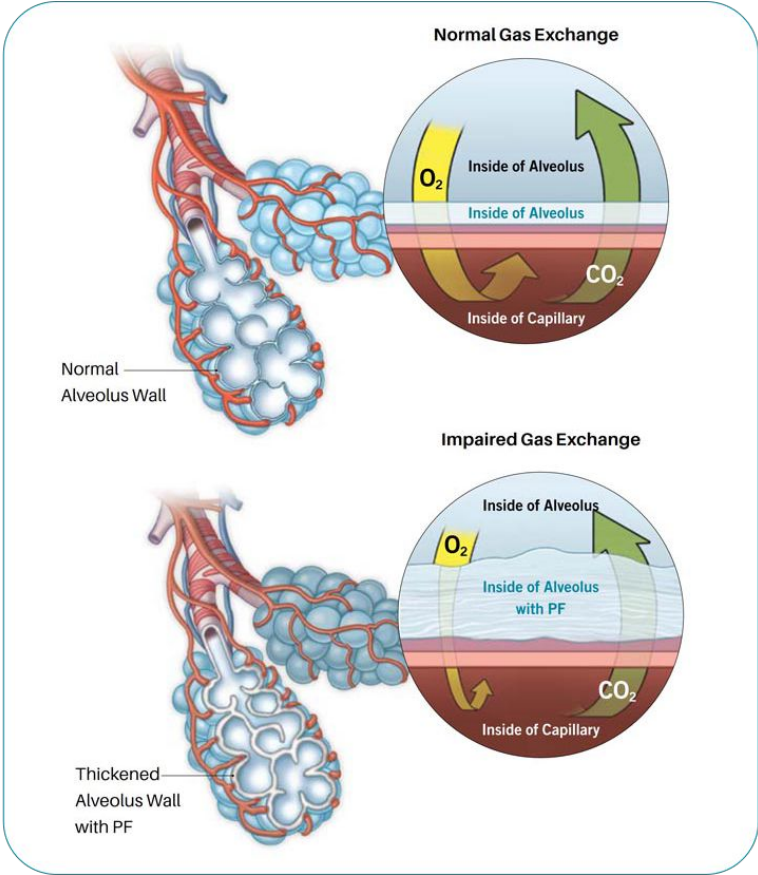


VANDERBILT
UNIVERSITY
MEDICAL
CENTER

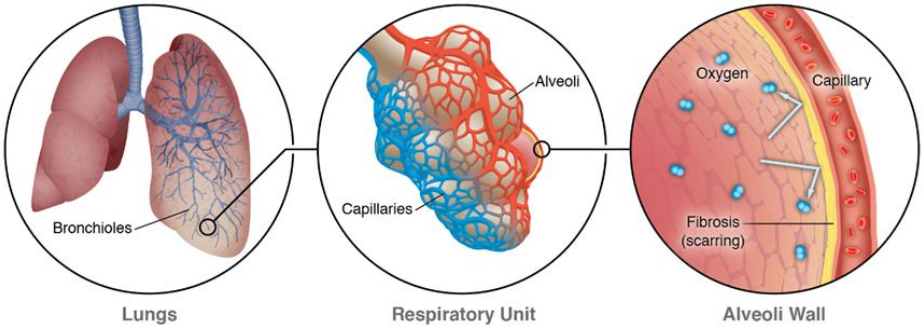
Chronic Bronchiolitis



Idiopathic Pulmonary Fibrosis



Interstitial Lung Diseases



CLICK
TO
REWIND

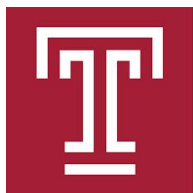
Well, that's the story I usually tell people



I went to nerd camp



(2004-2007ish)



Temple University Minority Access to Research Careers (MARC)

7TH & 8TH GRADE STEM PREP PROJECT CURRICULUM

Grades
Junior High – 7th and 8th
Duration
5 Weeks
Course of Study
<ul style="list-style-type: none">Basic Laboratory science techniques, experiments, and proceduresTechnology and Engineering Concepts and LabsResearch Writing SkillsResearch PresentationResearch Statistics

9TH & 10TH GRADE STEM PREP PROJECT CURRICULUM

Grades
High School 9th & 10th
Duration
8 Weeks
Course of Study
Students work in basic science laboratories in an academic/university setting under the direct supervision of their assigned mentor/research scientist. Utilizing the skills learned in 7th and 8th grade, students work on a specific area of their mentors project.
Interactive Seminar Series
<ul style="list-style-type: none">Positive Peer SupportProfessional DevelopmentPreparing for CollegeChoosing the right college, and medical or graduate schoolFinancing your post high school education

FOURTH YEAR UNDERGRADUATE STEM PREP PROJECT CURRICULUM

Grades
Fourth Year Undergraduate
Duration
10 Weeks
Locations
<ul style="list-style-type: none">Merck Pharmaceutical Company, Rahway (New Jersey)National institutes of Health, Bethesda (Maryland)
Housing
College trainees are provided free housing during their summer internships, but are not provided dorm supervision since they are 18 years or older. College seniors working at Merck-Rahway will live in New Brunswick in housing provided by Merck. College seniors working at the National Institutes of Health will live in apartments in Bethesda provided by the Distance Learning Center.

100% graduate from college
92% complete the 10-year regimen
83% matriculate into STEM
post-baccalaureate educational programs

Becoming a scientist became a choice

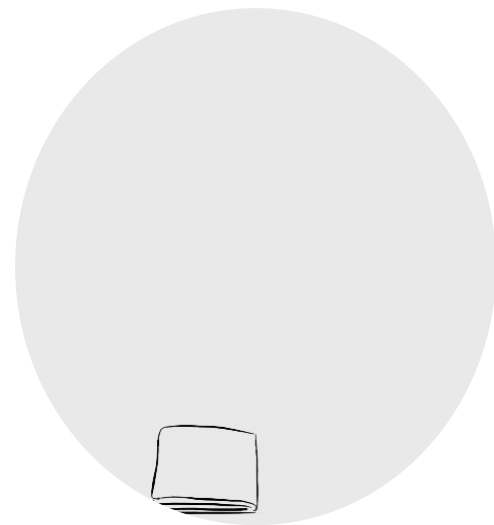




Books to Bugs to Biopsies



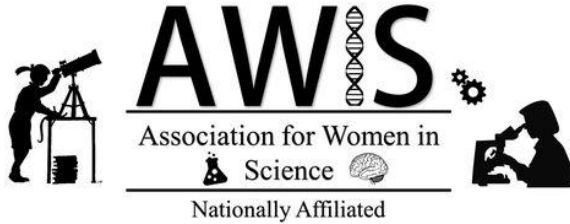
Diversity in STEM



Diversity in Healthcare

Women in STEM

EMORY UNIVERSITY GRADUATE SCHOOL







“ the 1960s immigration of Filipinos to the United States to mitigate the country’s nursing shortage. These Filipino immigrants utilized their nursing careers as a means to survive in the U.S., and most of them were successful.

They then encouraged their children to pursue healthcare-related careers with the hopes that they too would secure a financially stable future in this ‘scary, foreign land.’”



“So, only the people who have the capacity to **have a low income for a decade**, at least, are the ones who make it through. Others who need to be able to support their family might not be able to choose this career because they can't afford to live on such a low income.”

Fellow Filipinx in STEM

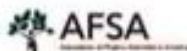


Sigrid Ladores PhD, RN, PNP, CNE



Pinoy at Vanderbilt

**We are a network of Filipino/a/x Scientists in America
seeking to utilize our collective expertise and resources
to support our communities in
the Philippines and the United States.**



Follow

Association of Filipino Scientists in America

@AFSAOfficial

We are a community of Filipino/a/x scientists in America seeking to utilize our collective expertise and resources to support our communities. 🧠🔬🇵🇭🇺🇸

[🔗 instagram.com/afsa.official](https://www.instagram.com/afsa.official) 📅 Joined October 2019

1,321 Following 1,370 Followers

'The wolf of racial bias': the admissions lawsuit rocking Harvard

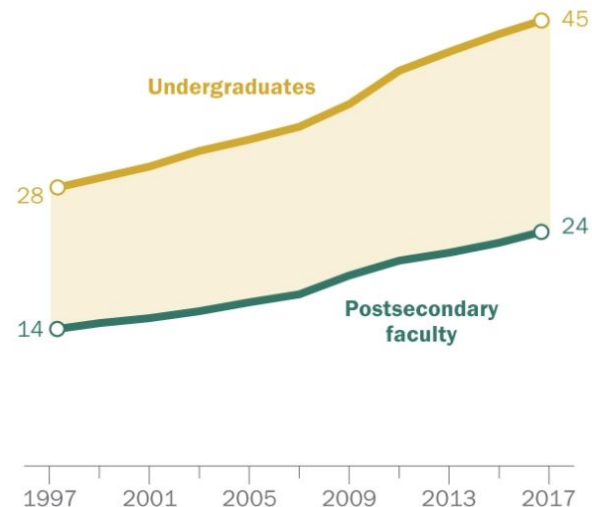
As a trial on alleged Asian American discrimination that may decide the fate of affirmative action plays out in Boston, both sides charge the other with racism



▲ Demonstrators hold slogans in front of a courthouse in Boston, Massachusetts, on 15 October. Photograph: Xinhua/Barcroft Images

U.S. college students still more likely than faculty to be racial or ethnic minorities

% of undergraduates and postsecondary faculty who are nonwhite



Note: "Nonwhite" includes blacks, Hispanics, Asians, Pacific Islanders, American Indians or Alaska Natives, and those of two or more races. Those categorized as "non-resident alien" and "race/ethnicity unknown" are not included in this analysis. Source: National Center for Education Statistics.

PEW RESEARCH CENTER

Are Asians and Asian-Americans Excluded in Diversity, Equity, and Inclusion Initiatives?

Lowell Andrew R. Iporac ✉

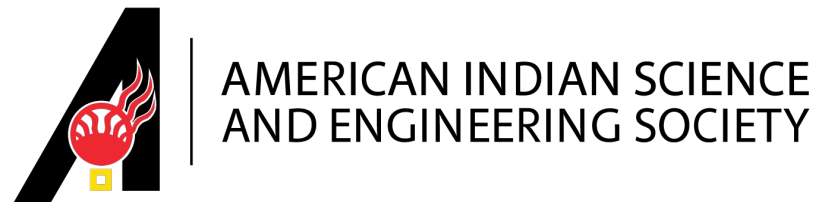
First published: 06 November 2020 | <https://doi.org/10.1002/lob.10408> | Citations: 1

abolish the term “underrepresented minorities”

URM implies

- a deficit among groups that were historically excluded or erased in STEM disciplines
- representation by assimilating in the STEM work climate would solve centuries of oppressive systemic racism that led to these conditions

Ways to find your communities



*Advancing Chicanos/Hispanics
& Native Americans in Science*



#BlackInNeuro
#BlackInChem
#BlackAFinSTEM
#BlackBirdersWeek
#BlackInAstro
#PinoyScientists
#BLACKandSTEM

#ScientistsWhoSelfie

EXCEL!
School of Natural Sciences

stem4
supporting teenage mental health



Korie Grayson, PhD
STEM Diversity Advocate
Biomedical Engineer Degree from Cornell

This is what a scientist
looks like 🧪🔬



@women.doing.science
@blackincancer
@stemnoire



Stephanie Castillo

- Ph.D. Candidate in Science Communication at Vanderbilt University
- Jackson Wild Media Lab Fellow
- Youtube University
- World Congress of Science & Factual Producers
- Vanderbilt Digital Learning Fellow



Ph.uture D.octors

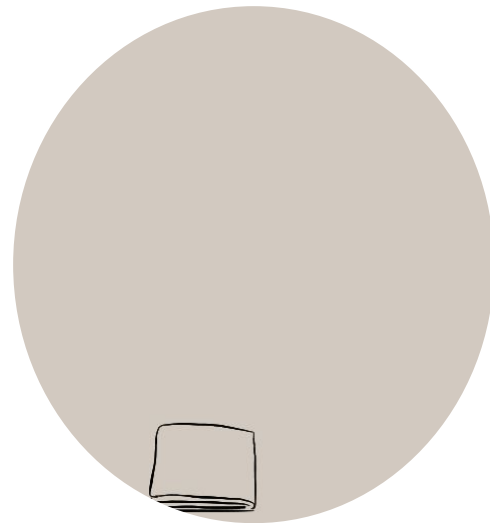
Curiosity. Research. Diversity.



Books to Bugs to Biopsies



Diversity in STEM



Diversity in Healthcare



Jocelyn J. Fitzgerald, MD

@jfitzgeraldMD



In med school, I took an elective called "Stress", foolishly thinking I was going to learn about meditation and yoga. Instead the professor spent 6 weeks proving that being poor or a minority literally destroys your health on a molecular level, and I think about that every day.

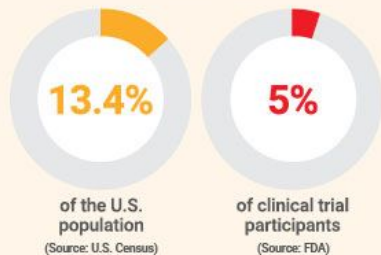
Clinical Research PATHWAYS

Opening Access. Advancing Treatments.

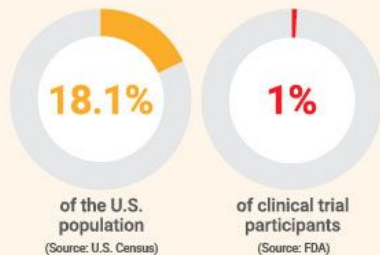
A

Minority
underrepresentation
in clinical trials

BLACK OR AFRICAN AMERICANS

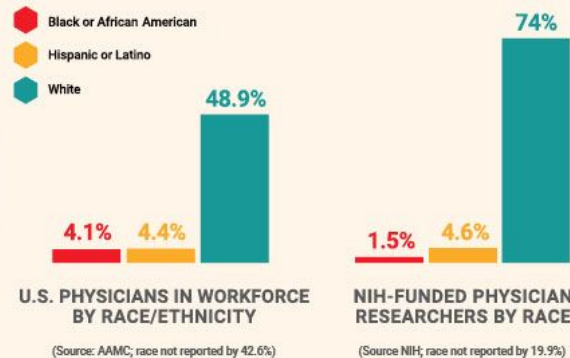


HISPANIC OR LATINO ORIGIN



B

Lack of minority
physicians/researchers



C

Goal of the Clinical
Research Pathways
diversity project

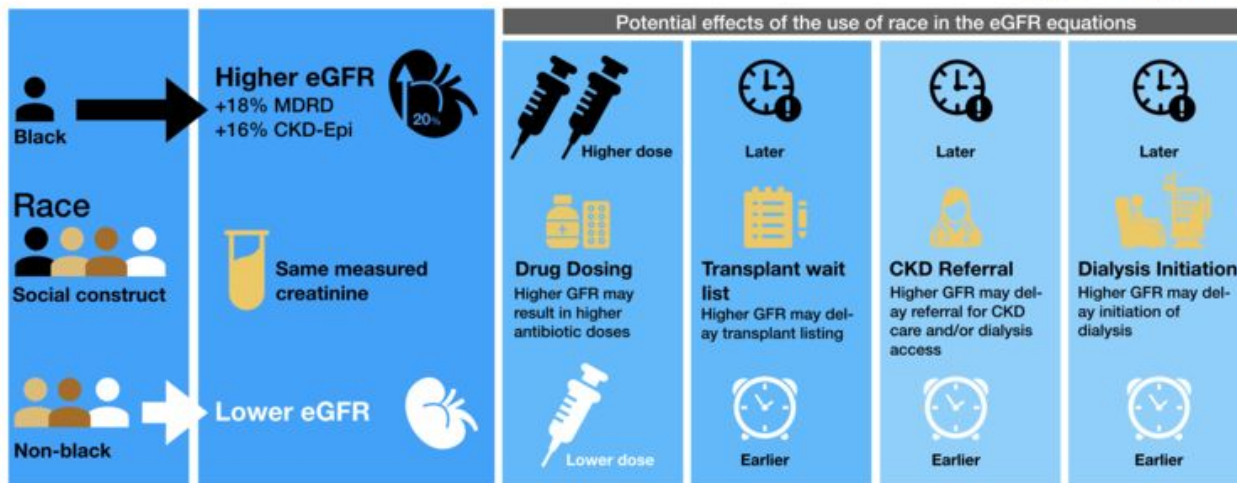
To advance health equity by
increasing the number of
minority clinical investigators
and participants in clinical trials.



Racist “Normalization” Algorithms in Healthcare

Do the current eGFR equations disadvantage the black patients?

Eneanya ND, Yang W, Reese PP. Reconsidering the Consequences of Using Race to Estimate Kidney Function. *JAMA* 322 Number 2, July 9, 2019.



65 year old man
Creatinine 3.4
“White”
eGFR = 18
Eligible for transplant

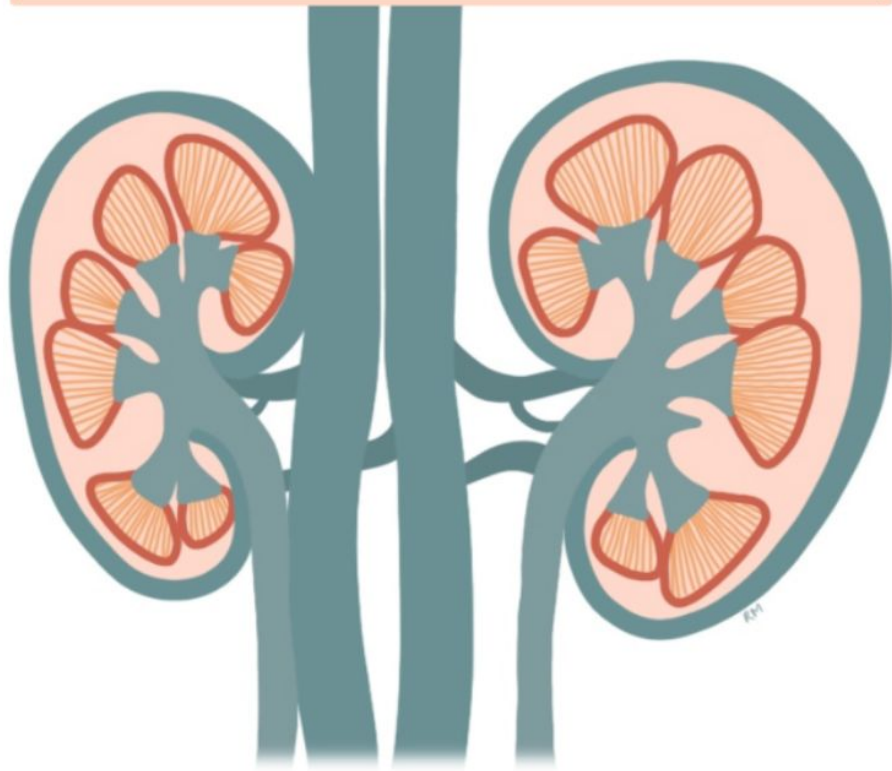


65 year old man
Creatinine 3.4
“Black”
eGFR = 21
Ineligible for transplant

Conclusions -The use of kidney function estimating equations that include race can cause problems with transparency and may unduly restrict access to care in some cases. The marginal improvement in accuracy may not justify use of this demographic variable.

Visual Abstract by Krithika Mohan (@Krithicism), NSMC Intern 2019

Campaign Against Racism (CAR) **Toolkit to End Racialized Medicine:** **eGFR edition**



VANDERBILT  School of Medicine

What does it take to make a change? Med students publish a toolkit to end racialized medicine

by Emma Mattson

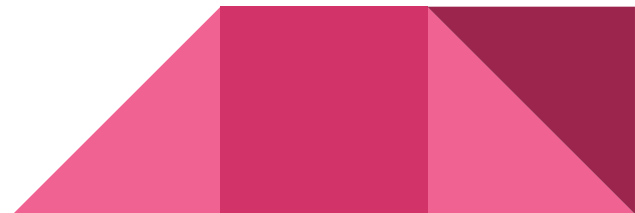
Confronting race in diagnosis: Medical students call for reexamining how kidney function is estimated

Bridget Balch, Staff Writer

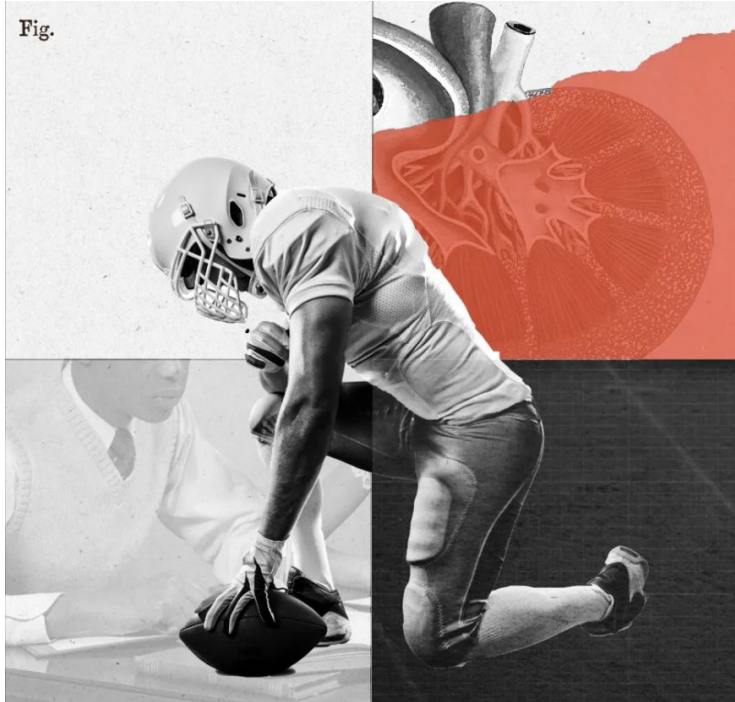
September 24, 2020

NEWS | May 18, 2021

UC Davis drops race-based reference ranges from a standard kidney test



Racist “Normalization” Algorithms in Healthcare



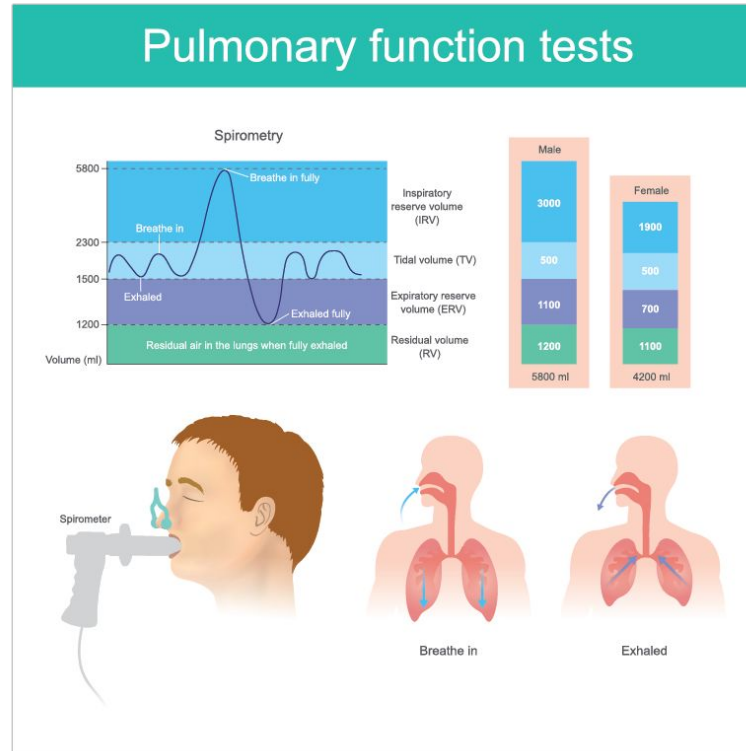
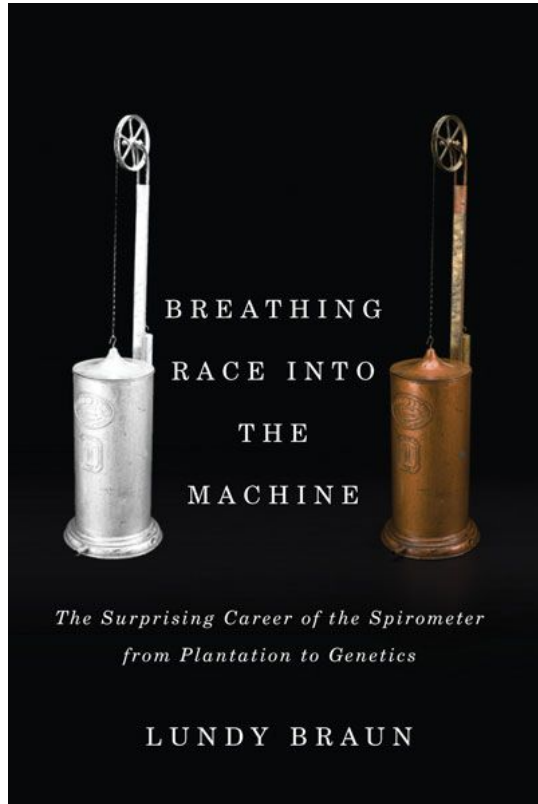
The NFL's Racist 'Race Norming' Is an Afterlife of Slavery

A statistical manipulation that underpaid Black players in concussion settlements exemplifies American football's immersion in the legacy of slavery

By Tracie Canada, Chelsey R. Carter on July 8, 2021

**SCIENTIFIC
AMERICAN®**

Institutional Racism and Lung Function



The Impact of Race Correction on the Interpretation of Pulmonary Function Testing Among Black Patients

A.T. Moffett¹, N.D. Eneanya¹, S.D. Halpern¹, G.E. Weissman¹,
https://doi.org/10.1164/ajrccm-conference.2021.203.1_MeetingAbstracts.A1030

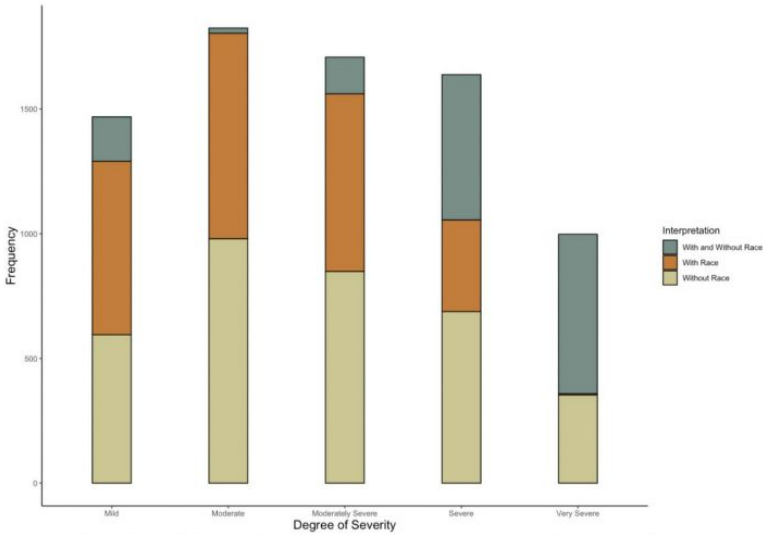
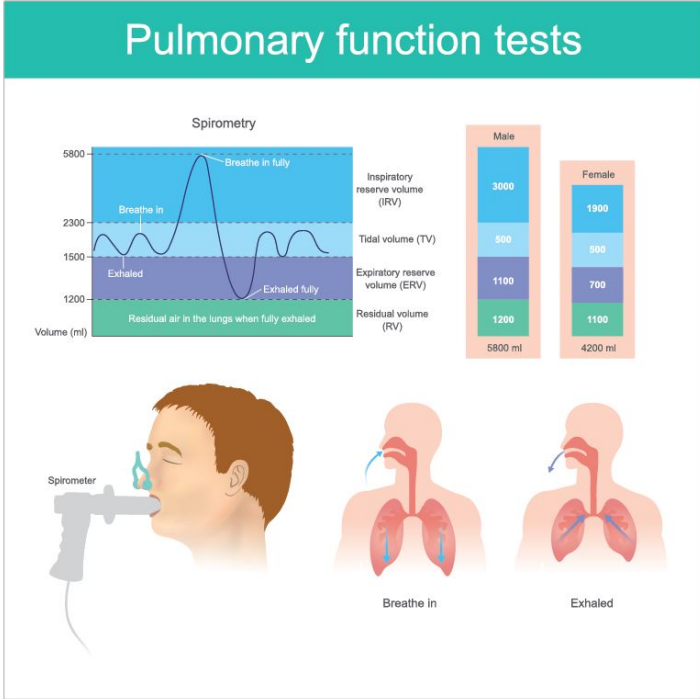


Figure. Alluvial plot depicting the effect of Black race correction on the degree of severity of obstructive, restrictive, and mixed defects among Black patients. The five categorical axes represent the severity of the defect according to American Thoracic Society criteria, while the separate colors in each bar represent the number of patients with the associated degree of severity when interpreted with, without, or both with and without race correction.

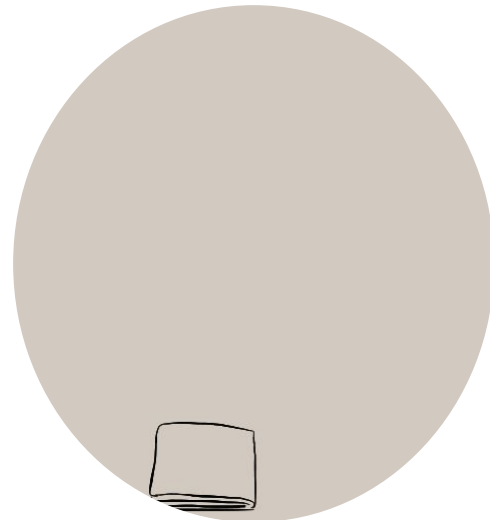




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Diversity in STEM



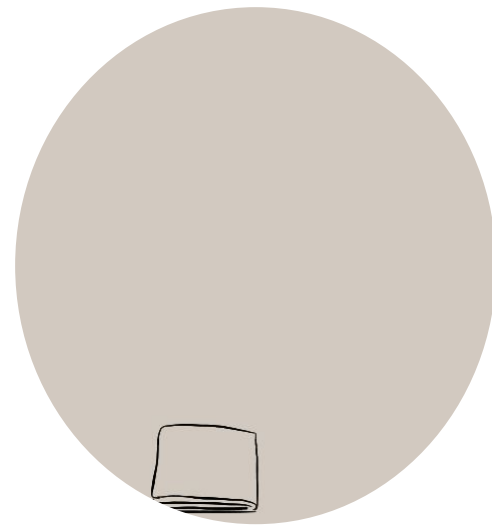
Diversity in Healthcare



**Find mentors &
be a mentor**



Diversity in STEM



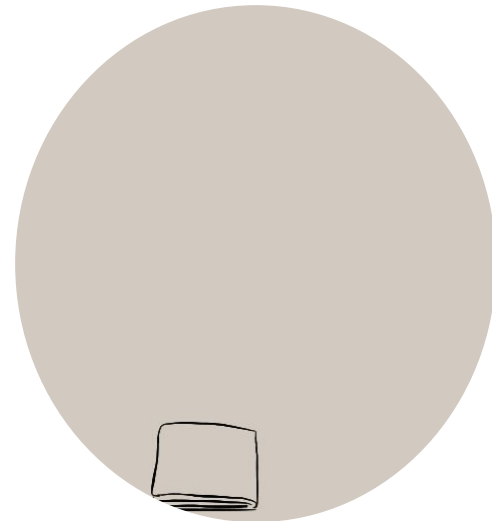
Diversity in Healthcare



**Find mentors &
be a mentor**



**Acknowledge,
embrace, & use what
makes you different**



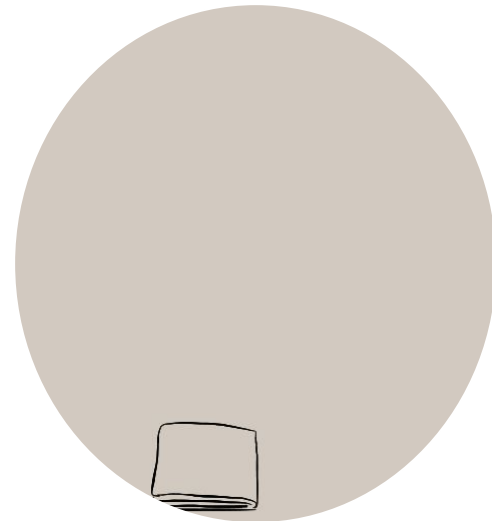
Diversity in Healthcare



**Find mentors &
be a mentor**



**Acknowledge,
embrace, & use what
makes you different**



**Fight institutionalized
prejudices**

Thanks for attending! Questions or Comments?



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