International Day of Women & Girls in Science



Medical miracles are no cure for vaccine hesitancy



In the last few months, multiple vaccines have emerged that are highly effective in protecting those who receive them against COVID-19. These are a 'next generation' type of vaccine, which harnesses the power of molecular biology and molecular engineering of small pieces of the coronavirus that trains our immune systems to recognize it and mount a sufficiently strong response. That these vaccines were developed

in less than a year speaks to the ingenuity of the human intellect and a collective determination to control this pandemic that has robbed so many lives, including the survivors who have lost their loved ones.

Yet now we face the strong possibility, a nontrivial probability that the SARS-CoV-2 may not be defeated, and not because we don't have the tools, but because a broad swath of the population will decline to be vaccinated. A mere 160 years ago, the majority of the U.S. population (and certainly the global population as well) could expect to die before the age of 40. By the turn into the 20th century, U.S. life expectancy had risen to over 45 years. By 1950, this figure was over 60 years, and it peaked at about 78 years in 2015. Comparable countries are at over 81 years. In short, infectious diseases were the predominant factor in curtailing life during what we now think of as early adulthood.

Today we rarely give thought to diphtheria, tetanus, pneumonia, tuberculosis, smallpox, polio (primarily in children), yellow fever and influenza. Having conquered one after the

next, it is now a few generations that stand between us and that ever-present fear of these infectious diseases that would strike without warning and sometimes decimate entire cities. The history is clear, but for most of our population, lost. While multiple advancements have contributed to this remarkable achievement, including sanitation in general, the separation of the water supply and distribution systems from wastewater, and antibiotics, a pivotal role was played by vaccines. The development of vaccines really began around the start of the 20th Century, and with little understanding of biology, and only an inkling of knowledge about viruses, the challenge was enormous. When the diphtheria vaccine was finally successful and presented to a gathering of scientists from around the world, they literally stood on their chairs to applaud the beginning of a new era in the control of infectious disease. These early vaccines were viewed by the public as miracles.

So here we are now: The pushback against vaccines is far stronger in the U.S. than in other socioeconomically comparable countries. What will it take to convince enough people to be vaccinated in order to achieve full herd immunity? Will it be a series of epidemics/pandemics, so that an overwhelmingly large proportion of the population has lost someone close to them? Can a concerted public health education campaign, with tailored messages for all the subcultures in our 'melting' pot, be an effective antidote?

One thing we can say thing for certain is that diverse voices and perspectives making the case for vaccines help. Having scientists like <u>Dr. Kizzmekia Corbett</u> leading the way in COVID research, highlights the importance women—and especially women of color—in STEM. From suffragettes to the #MeToo movement, women and girls of all backgrounds have been tearing down myriad forms of barriers to achieve the equity and dignity they've been denied. In science, we are breaking glass ceilings to become recognized for pioneering new fields, from gene editing to environmental exposomics and the applications of systems approaches. We still face micro-aggressions at the workplace, but also supportive allies, and when we see the brilliance of our students and trainees, and the adamant refusal of young women to be silenced, we see a future when the barriers, ceilings and all the constricting forces will have been fully evaporated.

Irva Hertz-Picciotto, PhD

Director, UC Davis Environmental Health Sciences Center



We'll miss you, Aubrey (and Finn)!

Effective community engagement in environmental health research requires a combination of skills, including relationship and trust building, attention to collective process, clear communication, creativity and patience. We've been so fortunate to have Aubrey Thompson as our Community Engagement Core (CEC) Associate Director for the past several years because she has all of these qualities in abundance. Aubrey came to the CEC with 10 years of science communication and community engagement experience, put her skills to the test and greatly elevated our work. She managed the <u>Community</u> <u>Stakeholder Advisory Committee (CSTAC)</u>, coordinated the CEC's support of the Center's <u>Pilot Project Program</u>, led a very successful 2-day <u>Environmental Justice Tour</u> in the San Joaquin Valley for NIEHS Director Linda Birnbaum and her executive team and greatly enhanced our community-based participatory action research training—and that's just part of the list!

Jane Sellen, Co- Director of <u>Californians for Pesticide Reform</u> and one of our CSTAC members, honored Aubrey in these terms which also speak to the sentiments of the CEC and EHSC as a whole: "Aubrey has been a joy to work with as our point of contact in the Community Engagement Core. Aubrey is as kind as she is thorough, and a highly skilled mediator between academia and the outside world. I will miss her very much and wish her all the very best in her future endeavors." — **Jonathan London**

COVID-19 research



ÓRALE Project: The <u>ORALE Project</u> (Organizaciones para Reducir, Avanzar y Lograr Equidad contra el COVID-19) has the goal to identify and overcome barriers to COVID-19 testing in vulnerable Latino/a residents in California's Central Valley. Our team is now ready to go out into these underserved farmworker communities to provide free COVID-19 testing. Our mobile test site will be offering tests in Fresno, Madera, Stanislaus and Yolo counties. We'll also conduct a survey to learn more about the challenges vulnerable Latinos/as and immigrants face, and their experiences during the COVID-19 pandemic. From the beginning of this project, we have been learning

from our collaborators:

- Radio Bilingüe
- Central California Environmental Justice Network (CCEJN)
- Lideres Campesinas
- Centro Binacional Para El Desarollo Indigena Oaxaqueño (CBDIO)
- Building Healthy Communities-Fresno (BHC)
- Madera Community Coalition for Justice (MCCJ)
- West Modesto Community Collaborative
- California Rural Legal Assistance Foundation (CRLAF)
- Health Education Council (HEC)
- Mexican Consulate in Sacramento
- RISE, Inc.

Our community partners are working to get the word out. They will also help with registration and lead the pre- and post-test counseling at the test sites.

If you have questions about ÓRALE, please reach out to Camille Burlaza (ciburlaza@ucdavis.edu).

COVID-19 & pregnancy: Rebecca Schmidt and her team are recruiting for UCSF's Healthy Outcomes of Pregnancy for Everyone (HOPE) Study, which now is available in <u>English</u> and <u>Spanish</u>. <u>Read more about it here</u>.

Portable, breath-based COVID diagnostics: Cristina Davis is leading a new project to develop a gas chromatography detector for COVID-19. Her project has two main goals:

- Determine the gas phase breath biomarkers associated with COVID-19
- Prototype, build and test a new portable breath analysis instrument in a hospital setting

Ultimately, the plan is to develop a commercial instrument that can diagnose COVID-19 rapidly at "point of testing" sites. Dr. Davis envisions an instrument that can analyze exhaled breath samples in less than five minutes to provide clinicians with a real-time diagnostic.

The project just launched and is funded by the NIH's National Center for Advancing Translational Sciences.

Novel COVID-19 lung treatment: Amir Zeki, MD has developed a novel COVID-19 treatment using inhaled statins. While research shows oral statin treatment in COVID patients can reduce the risk of severe disease, lead to faster recovery and reduce mortality, Zeki's research will look at the impact of using an aerosolized delivery mechanism to explore the full potential of these drugs. <u>Read more about his work here</u>.



Research spotlight

Pam Lein, PhD Molecular and cellular basis of PCB developmental neurotoxicity Funded: December 2020

Research on PCB developmental neurotoxicity (DNT) focuses almost exclusively on higher chlorinated (HC)- not lower chlorinated (LC)-PCBs. Previous research helped shed light on this gap with the discovery that LC-PCBs 11

and 28 made up more than 70 percent of PCBs in the serum of pregnant women who had an increased risk of giving birth to a child with a neurodevelopmental disorder. Preliminary data suggested PCB 11 caused DNT via activation of CREB-dependent signaling pathways but wasn't able to determine if metabolites altered neurodevelopment via the same molecular mechanism.

In this new project, Lein will use a mouse model to test her central hypothesis that CYPmediated metabolism influences the *in vivo* effects of LC-PCBs on CREB-dependent neurodevelopmental processes. She hopes to identify LC-PCBs as a new class of contaminants that interfere with neurodevelopment, and novel mechanistic data regarding the role of CREB signaling and CYP-mediated bioactivation in PCB DNT. This research will impact public health by helping to assess the risk LC-PCBs pose to the developing brain and provide critical insights into dietary and pharmacological manipulation of CYP activity to mitigate DNT risk in vulnerable populations. IF YOU HAVE COME HERE TO HELP ME, YOU'RE WASTING YOUR TIME. BUT IF YOU'VE COME BECAUSE YOUR LIBERATION IS BOUND WITH MINE, THEN LET US WORK TOGETHER. — LILLA WATSON.

EHSC Anti-racism Work Group

EHSC kicked off the New Year with a lively group of 13 members who came together to discuss implementing anti-racism projects throughout the work the Center does. The work group specifically discussed the <u>Anti-Racism Praxis Proposal for EHSC</u>, which the <u>Community Engagement Core</u> (CEC) spent several months putting together last year.

In small and full group discussions, we talked about the leadership role EHSC should play in anti-racism work on campus, the diversity of faculty and trainees being brought into the Center and efficacy of translating our research to action through community engagement.

EHSC success stories include leadership in promoting awareness of environmental racism and justice on campus through active research and seminars, the <u>EHSC Scholars</u> program in supporting new women faculty of color through funding and mentorship, as well as the CEC establishing new research projects like the one in <u>Kettleman City</u>. But we also saw areas for improvement such as increasing diversity of faculty, tailoring existing mentoring programs to better suit the needs of diverse faculty and trainees and reaching future researchers at the high school level through our community partners.

The EHSC Anti-racism Work Group is currently soliciting suggestions for potential seminar speakers, starting an anti-racism book club and working with campus administrators on an NIH proposal that would support cluster hiring of faculty working on environmental health disparities. If you'd like to participate in the Anti-racism Work Group, contact Janine LaSalle (jmlasalle@ucdavis.edu). – Janine LaSalle

COVID-19: Profiles from the frontlines of the pandemic



To help promote EHSC's <u>COVID-19 Survey for Workers</u>, we're interviewing people we know or have met online through the hundreds of COVID-19 Facebook groups we belong to.

In our interview with Darriene Hosley Stewart, the UX writer at Google talks about what privileged workers like her can do to help those who are struggling, how she makes the most of working from home and what she hopes

will come out of the pandemic for all Americans. Read Darienne's interview here.

If there's someone you know who may want to participate in this project, please contact Jennifer Biddle (jsbiddle@ucdavis.edu).

Updates from our cores

Community Engagement Core (CEC)

Phoebe Seaton and Shankar Prasad, our<u>Community Stakeholder Advisory Committee</u> Co-Chairs for the past seven years, are stepping down from their positions. We would like to celebrate all of the hard work and dedication that Phoebe and Shankar have given to our Center, campus and state! Good luck in your future endeavors!

Our incoming Co-Chairs are Nayamin Martinez and Marilyn Silva. Nayamin is the Executive Director of the <u>Central California Environmental Justice Network</u>. She works with immigrant and Indigenous communities across the San Joaquin Valley, and manages environmental public health programs involving pesticides, air quality and pollution. Marilyn's illustrious career includes many years at the <u>California Environmental Protection Agency's</u> <u>Department of Pesticide Regulation</u>, where she worked as a toxicologist on human health risk assessments and exposure studies. — **Sarina Rodriguez, Community Engagement Specialist, CEC**

Exposure Core

Connect with us! The Exposure Core has a number of activities planned for Winter Quarter and we are looking forward to engaging with Center members. Please reach out to Debbie Bennett (<u>dhbennett@ucdavis.edu</u>) with questions or if you would like to participate.

- **Consultations**: The Exposure Core is currently taking appointments to discuss researchers' exposure questions. If you have an ongoing project or planned grant application that could benefit from insight on measuring or interpreting exposure values, we will arrange a meeting to help you, bringing the relevant expertise to answer your questions.
- Seed Funding: February 10th we will begin accepting applications for seed funding for investigators who a) would benefit from adding an exposure measure to an existing study, b) would like to obtain proof-of-concept data or c) would like funding to develop an exposure measure. Other ideas encouraged. Check our seed funding

or Exposure Core pages for more information.

- Sampling in the 2021 wildfire season: The Exposure Core is hosting a brainstorming meeting to be prepared to measure exposures for the next fire season on February 25th at 2 PM. Bring your expertise on measuring exposures from wildfires, along with your thoughts on what additional measures should be collected during the next wildfire event. We hope to have a lively discussion by bringing together experts on air pollution, chemistry, toxicology and epidemiology.
- New chemicals in children's environmental health: Most children's health research focuses on a handful of compounds that are measured in multiple studies. But what about all those that aren't studied? The Exposure Core plans to discuss how we can be better able to assess emerging exposures March 16th, at 2 PM. The goal of the meeting is to assess the capabilities available at UC Davis to understand the complex mixture of chemicals we're exposed to, bringing together faculty from multiple departments who are working with methods to detect a broad range of chemicals to share idea that may enhance overall capabilities. Bring your favorite chemical class to the meeting. Debbie Bennett

Kent E. Pinkerton William N. Rom *Editors*

Respiratory Medicine Series Editors: Sharon I.S. Rounds - Anne Dixon - L

Climate Change and Global Public Health Second Edition

We help the world breather 💥 Humana Press

Integrated Health Sciences Facility Core

Kent Pinkerton, PhD edited the second edition of <u>Climate</u> <u>Change and Global Public Heath</u>, an up-to-date guide on climate change and respiratory health. The book includes the latest research by international experts on topics such as heat waves causing critical care-related diseases, climate-driven air pollution increases and high-level ozone and ozone exposure linked to idiopathic pulmonary fibrosis, lung cancer and acute lower respiratory infection. New chapters by UC Davis experts and others include extreme weather and agricultural safety in California; desert dust

effects on lung health; climate policy and the EPA; California's integrated approach to air quality and climate change; integrating climate change, the environment and sustainability themes into professional health science courses; and the role of the physician as climate advocate.

Published by Springer (Humana Press), it's also available on <u>Google Play</u>, <u>Kindle</u>, <u>Apple</u> <u>Books</u> and <u>Kobo</u>.

NIEHS news & events

Friends of NIEHS congressional briefing on wildfires and other natural disasters

Tuesday, February 9 from 9:30-10:45 AM PST (12:30 PM-1:45 PM EST)

Don't miss NIEHS Director Rick Woychik, ESHC Director Irva Hertz-Picciotto, Bernard Fontaine from the NIEHS Worker Training Program Task Force on Natural Disasters and COVID-19 and Elizabeth Del Re from the International Association of Fire Fighters speak on the ways NIEHS is advancing knowledge and response to recent disasters and supporting training initiatives to protect workers.

Compounding environmental health crises: COVID-

19 research

The Inaugural Symposium of the NIEHS Disaster Research Response Environmental Health Sciences Network will be held February through March 2021. All sessions of the symposia will be live via Zoom from noon – 1:30 PM EST. Topics include:

- January 13: COVID-19 Routes of Transmission and Exposure Mitigation
- February 4: Mental Health Impacts of COVID-19 Response
- February 25: Addressing COVID-19 Challenges with Community Partners
- March 2: COVID-19, Social Vulnerability and Environmental Injustice

Register for future sessions here.

Recently published

- Oh, J; Bennett DH; Calafat AM; Tancredi D; Roa DL; Schmidt RJ; Hertz-Picciotto, I; Shin HM. Prenatal exposure to per- and polyfluoroalkyl substances in association with autism spectrum disorder in the MARBLES study. Environment international. 2021 Feb; 147 :106328
- eBook: <u>Climate change, environmental justice and COVID-19: The perfect storm</u>. Lein PJ, Erlich AK, Miller LA, Van Winkle LS. January 2021.
- Evelyn SMD, Vogel CFA, Bein KJ, Lara B, Laing EA, Abarca EA, Zhang Q, Li L, Li J, Nguyen TB, Pinkerton KE. Differential inflammatory potential of particulate matter (PM) size fractions from Imperial Valley, CA. Atmospheric Environment, Volume 244, 1 January 2021, 117992
- Edwards S, Zhao G, Tran J, Patten KT, Valenzuela A, Wallis C, Bein KJ, Wexler AS, Lein PJ, Rao X. <u>Pathological Cardiopulmonary Evaluation of Rats Chronically</u> <u>Exposed to Traffic-Related Air Pollution</u>. Environmental health perspectives. 2020 Dec; 128 (12) :127003
- Rajapakse MY, Borras E, Fung AG, Yeap D, McCartney MM, Fabia FM, Kenyon NJ; Davis CE. <u>An environmental air sampler to evaluate personal exposure to volatile organic compounds</u>. The Analyst. 2020 Nov 18
- Zhu T, Zhang X, Chen X, Brown AP, Weirauch MT, Guilbert TW, Khurana H, Gurjit K, Biagini JM, **Ji, Hong**. <u>Nasal DNA methylation differentiates severe from</u> <u>nonsevere asthma in African American children</u>. Allergy. 2020 Nov 11

Announcements

Spring CSTAC Meeting: The Spring Community Stakeholder Advisory Committee Meeting will happen on February 22, 9:00 AM to 12 noon. If you would like to attend, please contact Sarina Rodriguez (<u>sverodriguez@ucdavis.edu</u>) for details.

We're (still) hiring! Our Center is expanding and staffing up as we take on new research. Please help by circulating information throughout your networks about these job postings:

Program Manager, UC Davis Environmental Health Sciences Center

Please contact our Human Resources representative Kristi Lusso for details and the link to the Program Manager opening (<u>kllusso@ucdavis.edu</u>).

In the news

- ABC-10 interviewed Irva Hertz-Picciotto in Free coronavirus testing available for Central Valley farmworkers
- Fox40 interviewed Nicholas Kenyon in <u>UC Davis clinic helping COVID-19 long-haulers</u>
- The Aggie interviewed Cristina Davis in <u>Women leading COVID-19 research at UC</u> <u>Davis</u>
- The San Francisco Chronicle interviewed Anthony Wexler in <u>California wildfires</u> could upend years of progress fighting air pollution
- The Tahoe Daily Tribune interviewed Kent Pinkerton in <u>UC Davis webinar</u> <u>discusses affects, dangers of wildfire smoke</u>

Infographic

We created the graphic below for Women & Girls in Science Day on February 11. You can download it here to share

In good company

Our favorite female scientists

We asked researchers at the UC Davis Environmental Health Sciences Center to name their favorite female scientist. This is what they said.



Fae Donat Wood, Zoologist

LAURA VAN WINKLE: One of my favorite female scientists is the first one I met: My maternal grandmother. She developed an animal model of rheumatoid arthritis and worked at UCLA. She also was a lifelong learner. She traveled throughout North and South America with my grandfather-both were naturalists interested in insect hosts of Chagas disease, animals and plants. Having scientist grandparents who were into understanding the natural world is what led me to my work in environmental toxicology. My grandmother always encouraged my interest in science and said when I was considering graduate school that her experience was one of the most exciting times of her life. Of course she also had a number of cautionary stories about barriers for women scientists-like the story about how a certain East Coast university would not let her take chemistry labs because it would be distracting to the male students, so she transferred to Berkeley. Even after she retired, she had scientific curiosity and would test different ways of growing plants to yield the best outcome for flowers or fruit. I remember going to her house when she was in her 70s to find her in the back yard standing on a chair measuring a sunflower because she had been testing a different pattern of watering and using fertilizers.



Theo Colborn, Zoologist

PAM LEIN: She had an amazing ability to connect seemingly



Monica McLemore, Nurse Researcher

TANYA KHEMET TAIWO: Dr. McLemore's research fo-



Jane Goodall, Primatologist

PAM LEIN: She's a favorite for her incredible pioneering



Pamela Lein, Neurotoxicologist

ANTHONY WEXLER, NICHOLAS KENYON & SASCHA NICKLISCH: unrelated observations and a knack for communicating science to lay audiences. She gave birth to the field of endocrine disruption. I had the chance to talk to her in person on several occasions-she was warm, funny and irreverent about many things.

cuses on understanding factors that influence the health, well-being and livelihood of low-income people and women of color. She uses the Reproductive Justice (RJ) framework to design rigorous studies addressing novel and complex research questions.

scientific discoveries and bravery championing protection of chimpanzees in the wild, and her ability to convert inspiration into action. Plus she gave us really meaningful quotes!

She is doing important work on the brain and how environmental toxicants can lead to neurological problems. She is successful yet pleasant, humble and respectful. She helps support young faculty in their academic careers without putting herself in the limelight.



Saraswathi Vedam, Midwife

TANYA KHEMET TAIWO: She has set national and international policy on place of birth and midwifery education and regulation. She has provided expert consultations to policy makers around the world and chaired four national Home Birth Consensus summits



Cristina Davis, **Biomedical Engineer**

NICHOLAS KENYON: Ladmire how she runs a large, complex research program that is 100% effort, maintains an administrative leadership role as department chair, but still has the time to engage with others to build relationships and teams to further novel research.



Marie Curie, Physicist & Chemist

CHRISTOPH VOGEL: She is my favorite for her courage, determination, perseverance and all that at a time when it was very difficult for women to succeed in science.



Savannah Mack D'Evelyn, **Physiologist**

KENT PINKERTON: She has an amazing ability to organize a research study, involve students and staff and reach out to the community where the research is being conducted.



Jedidah Isler, Astrophysicist

CLARE CANNON: She is the first African-American woman to complete her PhD in Astrophysics from Yale (2014). Her ability to communicate complex concepts in astrophysics to the public in a way that we can understand makes her my favorite scientist. This in her barrier-shattering career is an inspiration to all of us. Don't just take my word for it, check out her Ted Talk on "The untapped genius that could change science for the better" or her National Geographic video on 'Black holes blazars, and women of color in science."



Barbara McClintock. Cytogeneticist

LAURA VAN WINKLE: She studied genetic transposition and regulation in maize. Her work was very important and eventually she won the Nobel Prize, but initially it wasn't completely clear how her discoveries and research would lead to advances in understanding genetic control. She is a true example of a pioneering woman scientist doing basic research.

HONG JI: She was the first woman to receive an unshared Nobel Prize in Medicine or Physiology. I admire her dedication to research and desire for scientific freedom

Annie Jump Cannon, Astronomer

RANDY CARNEY: As a deaf woman, she overcame enormous obstacles to make major scientific discoveries. She manually catalogued about 350,000 stars on small photographic plates, binning them into categories by trends she observed in their appearance. Later, she realized she was actually measuring their temperature. Her stellar classification system is still used today, 100 years later. It's a pure example of rigorous observational science that lead to a new understanding of the world (and universe) around us, which truly inspires me!



Jane Sellen, **Citizen Scientist**

the Co-Director of Californians for Pesticide Reform. She is my favorite scientist because she has helped make communitybased environmental health research possible by connecting the research to the community. She helps channel community values and voice to make sure they are the center of research projects and the work benefits the community in meaningful ways. She also contributes key local knowledge to help design research methods as well as to ensure that the results are disseminated and applied in a way that will create a

JONATHAN LONDON: She is

practical impact.

environmentalhealth.ucdavis.edu



Tweet



Before Amanda Gorman (@TheAmandaGorman) stunned the world with her powerful words at the Inauguration, she wrote this defiant poem and love letter to California for us in collaboration with her sister @gormandotcom!

...

Watch this powerful poet in action!



From California Endowment 🤣 10:43 AM · Jan 24, 2021 · Twitter for iPhone

You never would have known from Amanda Gorman's commanding performance at the Inauguration that she once had a speech impediment, which she overcame with the help of a <u>song from the musical *Hamilton*</u>. Watch the ever-confident, younger Gorman recite her poetry in this beautiful <u>ode to California</u>.

If you have any announcements, new research, press coverage or anything else you'd like to share with your EHSC colleagues or our community partners in this newsletter, please contact Jennifer Biddle (jsbiddle@ucdavis.edu). Thank you!

Connect with us / environmentalhealth.ucdavis.edu

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