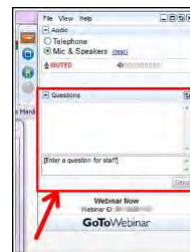




Have Questions?



Type them into questions box!

“Why am I muted?”

Don't worry. Everyone is muted except the presenter and host. Thank you and enjoy the show.

Contact ACS Webinars® at acswebinars@acs.org

1



@AmericanChemicalSociety



@AmerChemSociety



@AmerChemSociety



<https://www.linkedin.com/company/american-chemical-society>

Contact ACS Webinars® at acswebinars@acs.org

2

Check out the Edited Recordings!



Hundreds of presentations from the best and brightest minds that chemistry has to offer are available to you on-demand. The edited recordings are divided into 6 different sections to help you more easily find what you are searching.

Professional Development

[▶ View the Collection](#)

Learn how to write better abstracts, deliver more engaging presentations, and network to your next dream job. Brush up on your soft skills and set a new career path by mastering what can not be taught in the lab.

Technology & Innovation

[▶ View the Collection](#)

From renewable fuels to creating the materials for the technology of tomorrow, chemistry plays a pivotal role in advancing our world. Meet the chemists that are building a better world and see how their science is making it happen.

Drug Design and Delivery

[▶ View the Collection](#)

The Drug Design Delivery Series has built a collection of the top minds in the field to explain the mechanics of drug discovery. Discover the latest research, receive an overview on different fields of study, and gain insight on how to possibly overcome your own med chem roadblocks.

Culinary Chemistry

[▶ View the Collection](#)

Why does food taste better when it is grilled or what molecular compounds make a great wine? Discover the delectable science of your favorite food and drink and don't forget to come back for a second helping.

Popular Chemistry

[▶ View the Collection](#)

Feeling burdened by all that molecular weight? Listen to experts expound on the amazing side of current hot science topics. Discover the chemistry of rockets, how viruses have affected human history, or the molecular breakdown of a hangover.

Business & Entrepreneurship

[▶ View the Collection](#)

How do ideas make it from the lab to the real world? Discover the ins and outs of the chemical industry whether you are looking to start a business or desire a priceless industry-wide perspective.

<https://www.acs.org/content/acs/en/acs-webinars/videos.html>

3



ACS Webinars®

CLICK • WATCH • LEARN • DISCUSS



Learn from the best and brightest minds in chemistry! Hundreds of webinars on diverse topics presented by experts in the chemical sciences and enterprise.

Edited Recordings are an exclusive ACS member benefit and are made available once the recording has been edited and posted.

Live Broadcasts of ACS Webinars® continue to be available to the general public on most Wednesdays and Thursdays from 2-3pm ET!

A collection of the best edited recordings from past ACS Webinars will be broadcast on Fridays from 2-3pm ET!

www.acs.org/acswebinars

4

Advance YOUR CAREER

ChemIDP™




ChemIDP.org

Discover

ACS PUBLICATIONS

Publishing Resources




ACS Authoring Services

publish.acs.org

Connect

WITH CHEMISTS AND
OTHER SCIENCE
PROFESSIONALS

CAS SciFinder Future Leaders



171 alumni, 35 countries
and over 120 institutions

acsconcampus.acs.org/resources



ACS Department of Diversity Programs

Advancing ACS's Core Value of Diversity, Inclusion & Respect



We believe in the strength of diversity in all its forms, because inclusion of and respect for diverse people, experiences, and ideas lead to superior solutions to world challenges and advances chemistry as a global, multidisciplinary science.

Contact Us:
Diversity@acs.org

 @ACSDiversity

 ACS Diversity



acsvoices.podbean.com/



www.acs.org/diversity

6

ACS Efforts and Resources on COVID-19



Browse **ACS Resources** and **Initiatives!**

- **YOU MAY RECEIVE A ONE-YEAR WAIVER ON YOUR NATIONAL DUES** If your membership is up for renewal, but you're experiencing a special hardship, such as unemployment, furlough, reduced wages or illness.
- **RECEIVE ACCESS TO LINKEDIN LEARNING THROUGH THE END OF THIS YEAR** This powerful resource includes over 15,000 on-demand courses to support your continued learning and career advancement for active ACS members.
- **INOVA EAP/WORK-LIFE ASSISTANCE PROGRAM** 24/7 assistance on a wide range of issues, such as emotional, relationship, major life, health, wellness, educational and more for ACS members based in the United States. Confidential services are provided via telephone or comprehensive online resources.

www.acs.org/covid-19

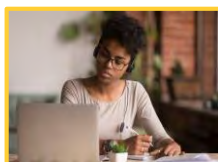
7

ACS Career Navigator: Your Home for Career Services



Whether you are just starting your journey, transitioning jobs, or looking to brush up or learn new skills, the **ACS Career Navigator** has the resources to point you in the right direction.

We have a collection of career resources to support you during this global pandemic:



Professional Education



Virtual Career Consultants



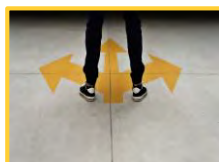
ACS Leadership Development System



Career Navigator LIVE!



ChemIDP



College to Career



ACS Webinars



Virtual Classrooms

Visit www.ACS.org/COVID19-Network to learn more!

8

What is ACS on Campus?



ACS visits campuses across the world offering FREE seminars on how to be published, find a job, network and use essential tools like SciFinder. ACS on Campus presents seminars and workshops focused on how to:



- Publish in top journals
- Find a job
- Effectively use research tools like SciFinder® and ACS ChemWorx
- Communicate your science
- Write grant proposals
- Build industry partnerships
- Prepare for a changing employment landscape

RESOURCES: <https://acsoncampus.acs.org/resources>

EVENTS: <https://acsoncampus.acs.org/events>

<http://acsoncampus.acs.org>

9

Grateful for your chemistry career?

Pay it forward with a donation to the ACS Scholars Program today!

www.donate.acs.org/scholars



ACS Office of Philanthropy
Chemistry for Life®



ACS Scholars Endowment Founder Joe Vacca, retired Vice President of Chemistry, Merck & Co., meets with his 2018 ACS Scholar **Johanna Masterson**, now a grad student at Princeton University.

“Chemistry has been good to me...so I wanted to make a significant gift to provide that opportunity to others.”

10

From ACS Industry Member Programs

◆ Industry Matters Newsletter

Exclusive interviews with industry leaders and insights to advance your career

Preview & Subscribe: acs.org/indnews



Connect, collaborate, and stay informed about the trends leading chemical innovation

Join: bit.ly/ACSinnovationhub

11

Make your voice heard!

The Division that works for you, the member

ACS Division of Professional Relations: *A home for all chemists*



<https://acsprof.org>

12

Free Upcoming ACS Webinars!



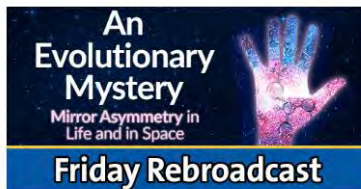
Thursday, July 16, 2020 at 2-3pm ET
 Speaker: Lawrence Silverman, University of Virginia
 Moderator: Heather Clark, Northeastern University

[Register for Free!](#)

What You Will Learn

- What are the common devices and what metrics do they provide
- What is the science behind these metrics
- What does the scientific literature report regarding these claims

Co-produced with: Partnership for Clean Competition and ACS Sensors



Friday, July 17, 2020 at 2-3pm ET
 Speaker: Brett McGuire, National Radio Astronomy Observatory
 Moderator: Ryan Fortenberry, University of Mississippi

[Register for Free!](#)

What You Will Learn

- What is the impact of homochirality on biology and chemical evolution
- What are the potential origins of homochirality and what are the challenges in studying possible interstellar origins
- What was the first detection of a chiral interstellar molecule and what are the challenges associated with measuring a potential chiral excess in space

Co-produced with: ACS Astrochemistry Subdivision



Wednesday, July 22, 2020 at 2-3pm ET
 Speakers: Maria Gallardo-Williams, North Carolina State University / Kyle Grice, DePaul University / Michael Seery, University of Edinburgh
 Moderator: Stacey Lowery Bretz, Miami University

[Register for Free!](#)

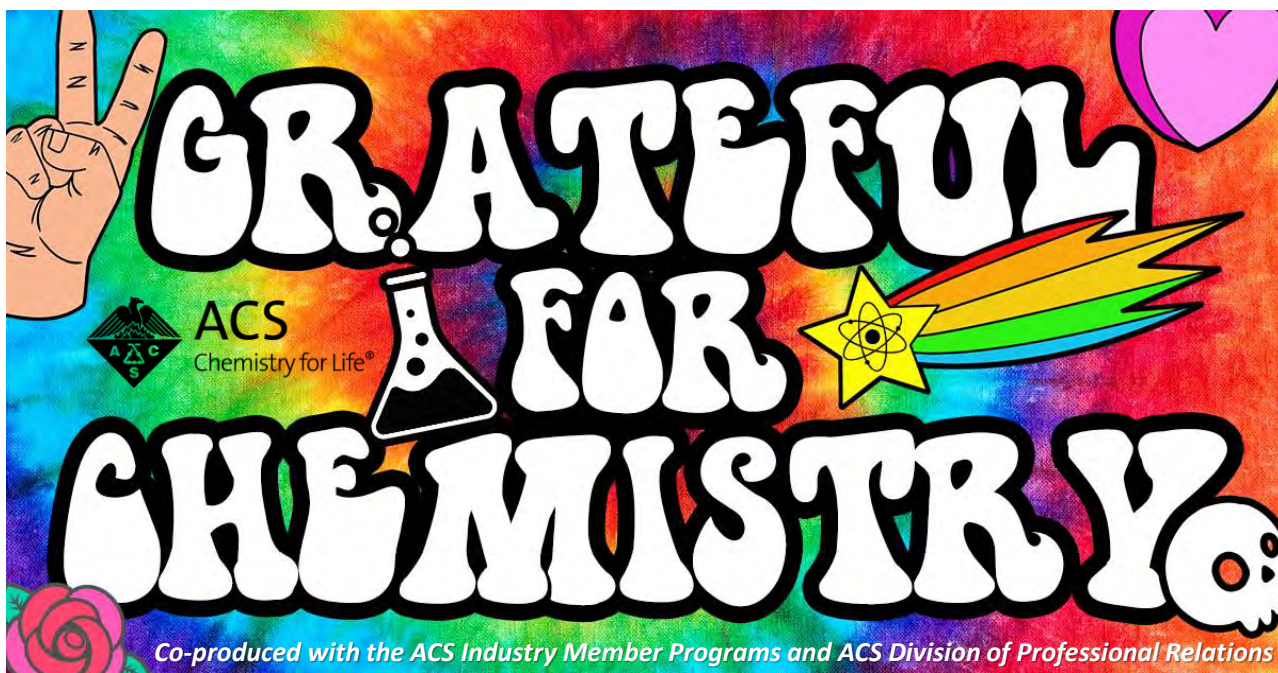
What You Will Learn

- Various goals and outcomes for online undergraduate laboratory experiences
- Examples of how laboratory goals and outcomes are being fulfilled
- Approaches for planning and assessing online laboratory experiences

Co-produced with: ACS Education

www.acs.org/acswebinars

13



THIS ACS WEBINAR WILL BEGIN SHORTLY...

14



Grateful for Chemistry



Mark Jones
Executive External Strategy and
Communications Fellow, Dow Chemical



Matt Grandbois
Strategic Market Manager,
DuPont Electronics & Imaging

Presentation slides are available now! Unedited recordings are an exclusive ACS member benefit.

www.acs.org/acswebinars

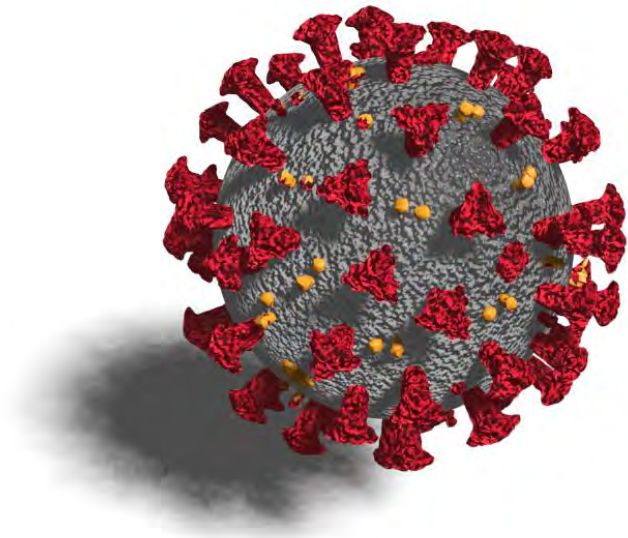
This ACS Webinar is co-produced with the ACS Industry Member Programs and ACS Division of Professional Relations

15



Three
Gratitudes





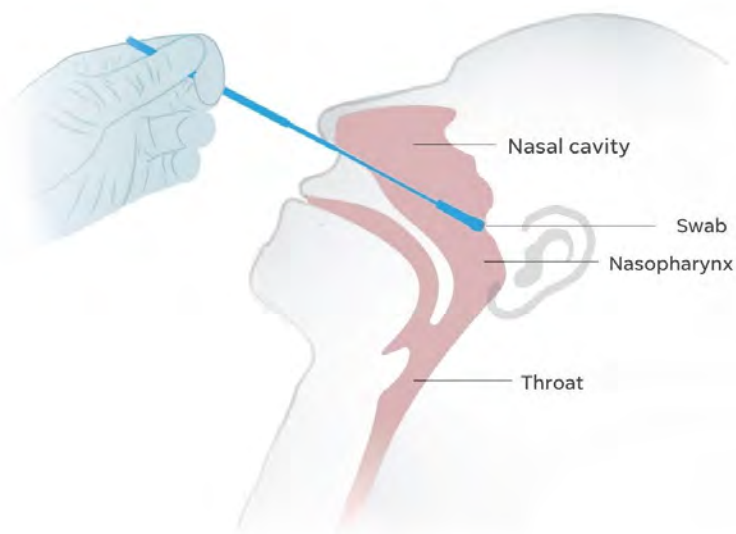
modified Coronavirus 3D model by Teliri on Sketchfab



Hydrogen peroxide

Dodecylbenzenesulfonic acid Ammonium bicarbonate Hypochlorous acid
 Peroxyacetic acid Ammonium carbonate Thymol Isopropanol
 Octanoic acid Ethanol Silver ion L-Lactic acid Sodium chlorite Citric acid
Quaternary ammonium
 Sodium carbonate Peroxyoctanoic acid Phenolic Sodium dichloroisocyanurate
Sodium hypochlorite





NUCLEIC ACID TESTS

Nucleic acid tests detect the virus's genetic material to confirm that a person is currently infected with the virus.

HOW DO THE TESTS WORK?



Virus RNA is extracted from a nose or throat swab. An enzyme called a reverse transcriptase converts the RNA to DNA.



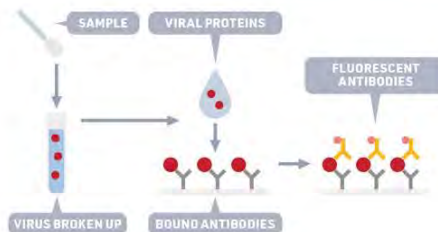
In some tests, polymerase chain reaction makes millions of copies of the transcribed DNA. Short, virus-specific oligonucleotide probes with a fluorophore on one end bind to the copies. An enzyme cleaves the probe, causing fluorescence and confirming infection.

ANTIGEN TESTS

Antigen tests look for fragments of viral proteins to confirm that a person is currently infected with the virus.

HOW DO THE TESTS WORK?

Antigen tests can be carried out in a variety of ways. Most use a sample collected on a swab, though some use blood samples.



Virus in a collected sample is chemically broken up in solution and added to a slide coated in antibodies. The antibodies bind to the viral proteins. Then, fluorescent antibodies are added, which attach to confirm a positive result.



PERIODIC GRAPHICS © C&EN 2020

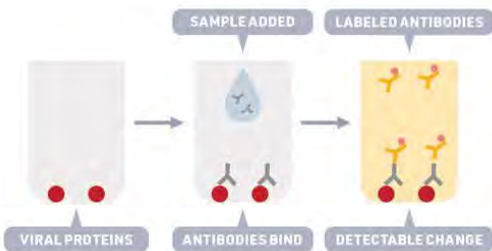
Created by Andy Brunning for *Chemical & Engineering News*

ANTIBODY TESTS

Antibody tests identify if a person has antibodies to the virus. If they do, they had an infection in the past.

HOW DO THE TESTS WORK?

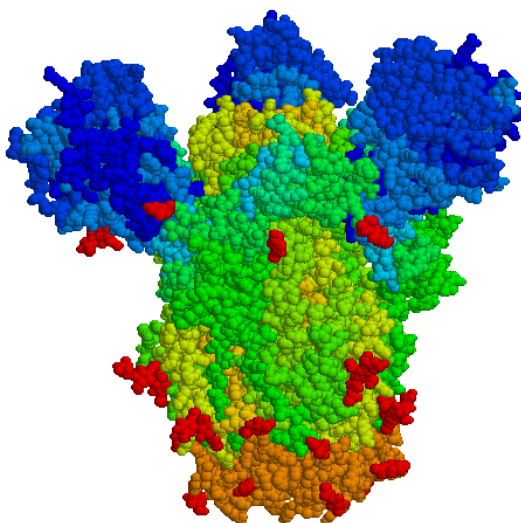
Many types of antibody tests are available. They all aim to detect antibodies in a person's blood, serum, or plasma sample.



Most antibody tests work by mixing a person's sample with viral proteins or protein fragments. Any antibodies the person generated will bind to these. Then a reporter molecule, such as a fluorescent antibody, is added to detect past infection.

PERIODIC GRAPHICS © C&EN 2020
Created by Andy Brunning for *Chemical & Engineering News*

<https://cen.acs.org/content/dam/cen/98/25/WEB/09825-feature4-graphicweb.jpg>

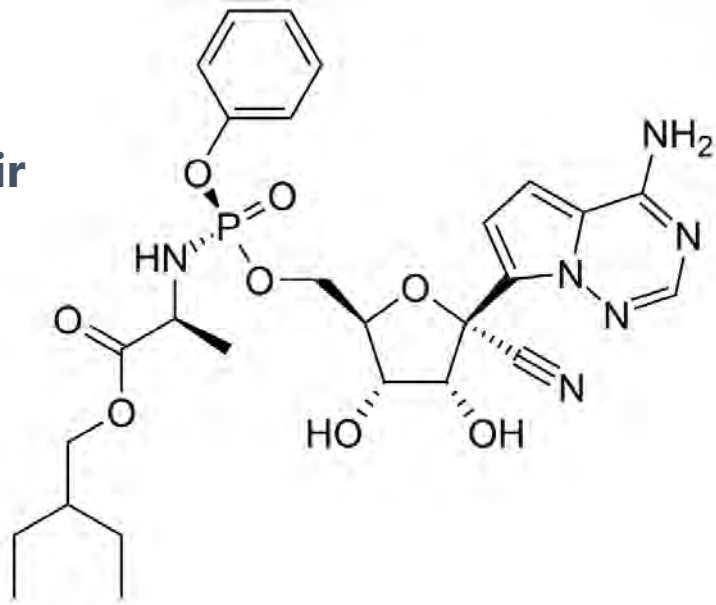


RCSB Protein Data Bank 6CRV SARS Spike Glycoprotein

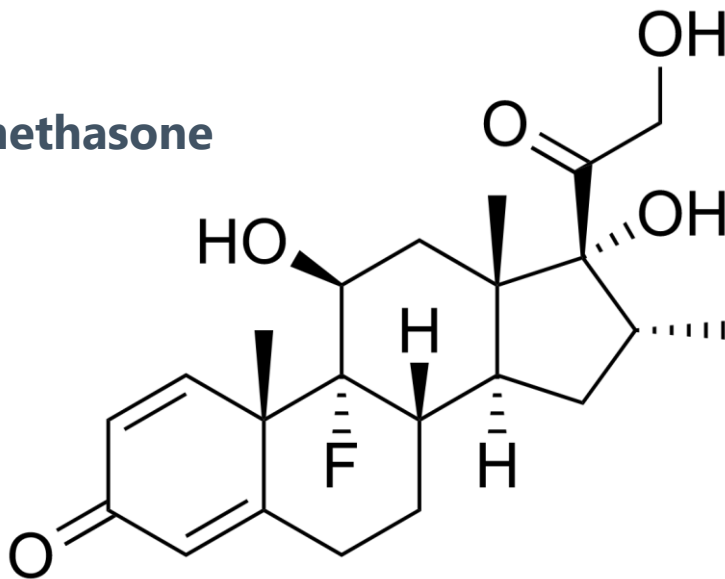




Remdesivir



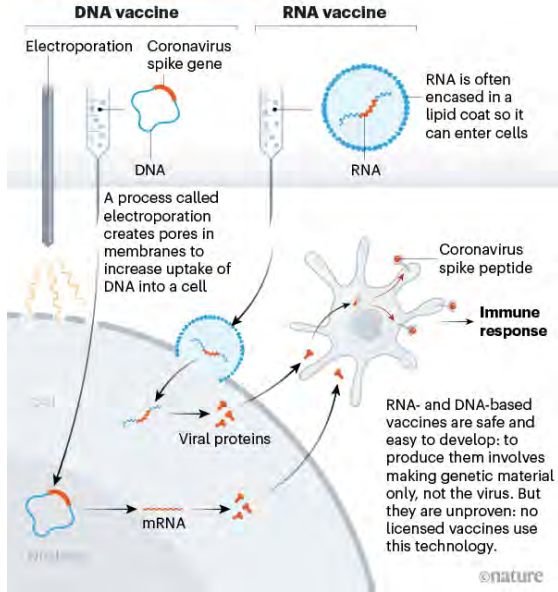
Dexamethasone





NUCLEIC-ACID VACCINES

more than 90 vaccines under development using 8 different strategies – 4 very chemical



Ewen Callaway, "The race for coronavirus vaccines: a graphical guide", *Nature* 580, 576-577 (2020) doi: 10.1038/d41586-020-01221-y

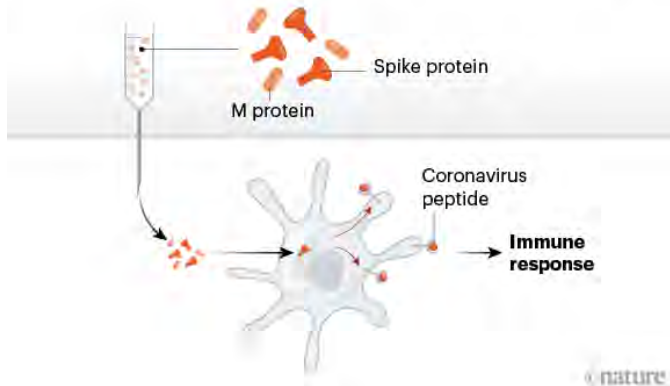


PROTEIN-BASED VACCINES

more than 90 vaccines under development using 8 different strategies – 4 very chemical

Protein subunits

Twenty-eight teams are working on vaccines with viral protein subunits – most are focusing on the virus's spike protein or a key part of it called the receptor binding domain. Similar vaccines against the SARS virus protected monkeys against infection but haven't been tested in people. To work, these vaccines might require adjuvants – immune-stimulating molecules delivered alongside the vaccine – as well as multiple doses.



Ewen Callaway, "The race for coronavirus vaccines: a graphical guide", *Nature* 580, 576-577 (2020) doi: 10.1038/d41586-020-01221-y



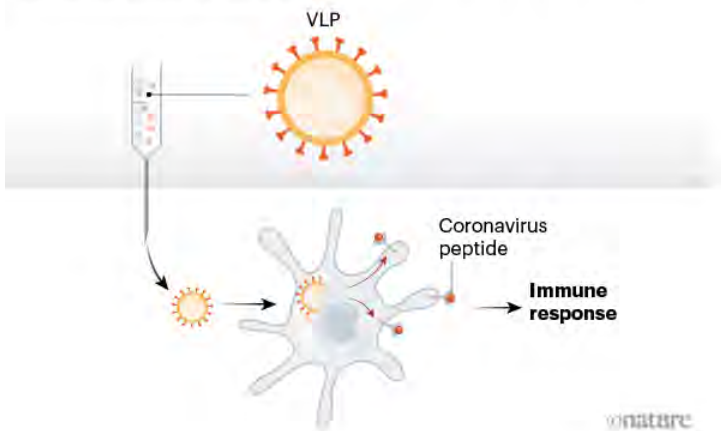


PROTEIN-BASED VACCINES

Virus-like particles

Empty virus shells mimic the coronavirus structure, but aren't infectious because they lack genetic material. Five teams are working on 'virus-like particle' (VLP) vaccines, which can trigger a strong immune response, but can be difficult to manufacture.

more than 90 vaccines under development using 8 different strategies – 4 very chemical



Ewen Callaway, "The race for coronavirus vaccines: a graphical guide", *Nature* 580, 576-577 (2020) doi: 10.1038/d41586-020-01221-y



Audience Challenge Question

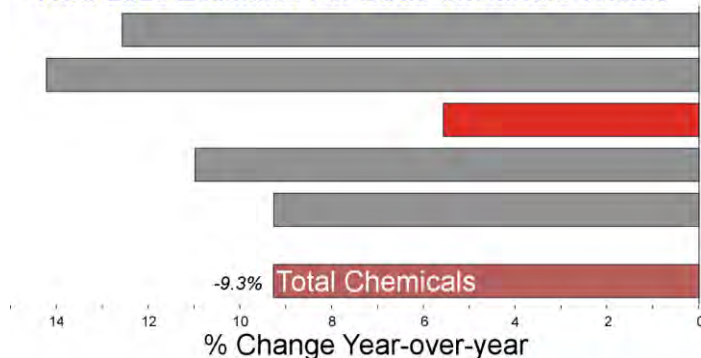
ANSWER THE QUESTION ON BLUE SCREEN IN ONE MOMENT



2020 estimates for U.S. chemical production predict declines. What sector is the red bar?

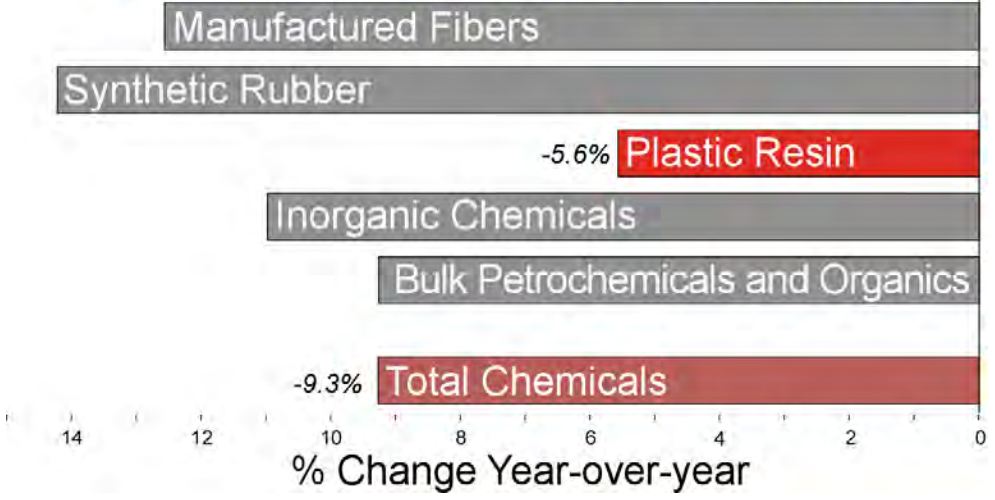
- Basic petrochemicals and organic chemicals
- Manufactured fibers
- Inorganics
- Synthetic rubber

ACC 2020 Estimates For Basic Chemicals Volume





ACC 2020 Estimates For Basic Chemicals Volume



June 2020 American Chemistry Council Mid-year Situation & Outlook



washingtonpost.com/nation/2020/04/23/factory-masks-coronavirus-ppel/





RESOURCES



FINANCIAL TIMES
Coronavirus pandemic: [Add report?](#)
What coronavirus tests does the world need to track the pandemic? | FT
China's companies predominate in race to make diagnostics

Drug Target Review
3D visualisation of COVID-19 surface released for researchers
A new 3D model of the surface of the coronavirus COVID-19 has been released to all researchers in the development of a treatment.

EPA
Environmental Topics | Laws & Regulations | About EPA
List N: Disinfectants for Use Against SARS-CoV-2 (COVID-19)
All products on this list meet EPA's criteria for use against SARS-CoV-2, the virus that causes COVID-19.
Finding a Product
To find a product, enter the EPA Reg. No. or the EPA registration number.

c&en
TOPICS • MAGAZINE • COLLECTORS • VIDEO • JOBS
How we know disinfectants should kill the COVID-19 coronavirus
The novel virus is one of the easiest virus types to deactivate, though SARS-CoV-2-specific data gaps lacking.
A virus is "simply a piece of biology," says Jean and Peter

nature
CORONAVIRUS VACCINES
The first coronavirus vaccine is expected to be available in the next few months.

nytimes.com/interactive/2020/04/03/science/coronavirus-genome-bad-news-wrapped-in-protein.html

ft.com/content/0faf8e7a-d966-44a5-b4ee-8213841da688

drugtargetreview.com/news/57287/3d-visualisation-of-covid-19-surface-released-for-researchers/

cen.acs.org/biological-chemistry/infectious-disease/How-we-know-disinfectants-should-kill-the-COVID-19-coronavirus/98/web/2020/03

www.nature.com/articles/d41586-020-01221-y

www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2-covid-19



Audience Survey Question

ANSWER THE QUESTION ON BLUE SCREEN IN ONE MOMENT



How much has Zoom daily user count increased since the pandemic forced workers to stay at home?

- 57%
- 182%
- 378%
- 466%



** If your answer differs greatly from the choices above tell us in the chat!*

33

WFH policies have placed an unprecedented demand on global digital communications infrastructure



- Working from home has meant more virtual meetings via Zoom, Skype, Teams, etc....
- Internet usage has dramatically increased globally, yet we have not yet “broke the internet” ...**Why??**
- Chemistry has enabled the proliferation of digital communication

Who broke the internet?

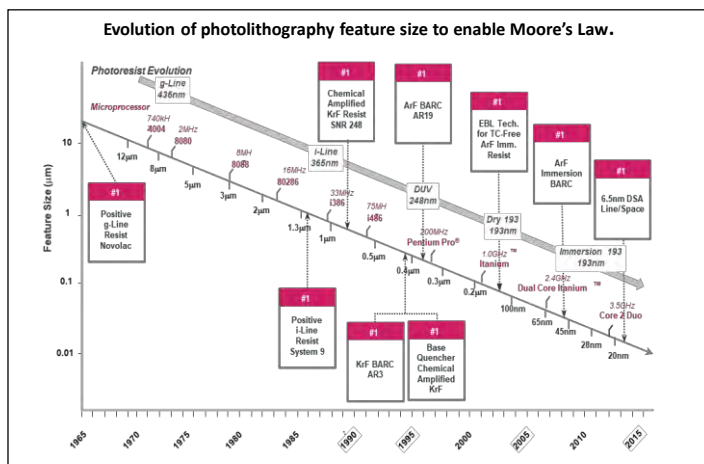


◀ DUPONT ▶

<https://twitter.com/wreckitralph>

34

Moore's Law has been able through development of countless chemical innovations.



- Fabrication of electronic semiconductor devices utilize [chemical](#), [mechanical](#), [planarization](#), [photoresists](#), [antireflective coatings](#), ultrapure cleaners and removers, controlled metallization, thermal insulation materials.....



35

Societal infrastructure exists with unprecedented willingness to listen, share, and take action in response to escalation atmosphere of social unrest.



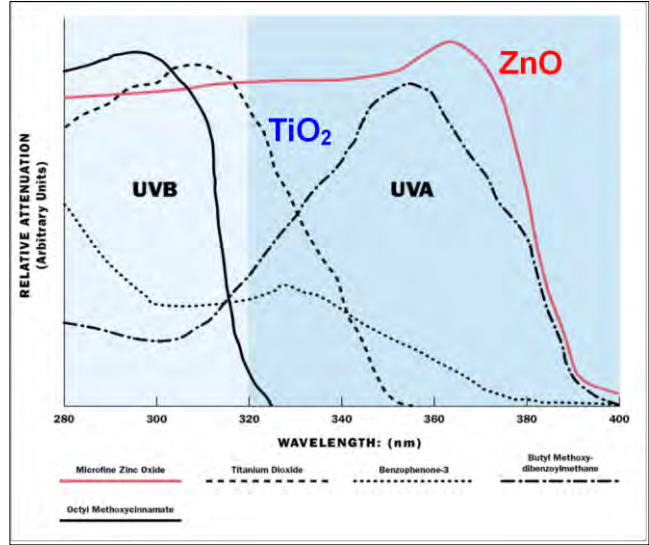
Division of Professional Relations



36



As “dog days” of summer come, I am grateful for the relative attenuation of commonly found sunscreens



<https://forums.anandtech.com/threads/whats-your-fav-sunscreen.2320449/page-2>



Free Upcoming ACS Webinars!



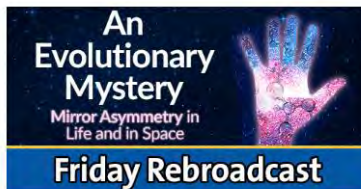
Thursday, July 16, 2020 at 2-3pm ET
 Speaker: Lawrence Silverman, University of Virginia
 Moderator: Heather Clark, Northeastern University

[Register for Free!](#)

What You Will Learn

- What are the common devices and what metrics do they provide
- What is the science behind these metrics
- What does the scientific literature report regarding these claims

Co-produced with: Partnership for Clean Competition and ACS Sensors



Friday, July 17, 2020 at 2-3pm ET
 Speaker: Brett McGuire, National Radio Astronomy Observatory
 Moderator: Ryan Fortenberry, University of Mississippi

[Register for Free!](#)

What You Will Learn

- What is the impact of homochirality on biology and chemical evolution
- What are the potential origins of homochirality and what are the challenges in studying possible interstellar origins
- What was the first detection of a chiral interstellar molecule and what are the challenges associated with measuring a potential chiral excess in space

Co-produced with: ACS Astrochemistry Subdivision



Wednesday, July 22, 2020 at 2-3pm ET
 Speakers: Maria Gallardo-Williams, North Carolina State University / Kyle Grice, DePaul University / Michael Seery, University of Edinburgh
 Moderator: Stacey Lowery Bretz, Miami University

[Register for Free!](#)

What You Will Learn

- Various goals and outcomes for online undergraduate laboratory experiences
- Examples of how laboratory goals and outcomes are being fulfilled
- Approaches for planning and assessing online laboratory experiences

Co-produced with: ACS Education

www.acs.org/acswebinars

39



Grateful for Chemistry



Mark Jones
 Executive External Strategy and
 Communications Fellow, Dow Chemical



Matt Grandbois
 Strategic Market Manager,
 DuPont Electronics & Imaging

Presentation slides are available now! Unedited recordings are an exclusive ACS member benefit.

www.acs.org/acswebinars

This ACS Webinar is co-produced with the ACS Industry Member Programs and ACS Division of Professional Relations

40

From ACS Industry Member Programs

◆ Industry Matters Newsletter

Exclusive interviews with industry leaders and insights to advance your career

Preview & Subscribe: acs.org/indnews



Connect, collaborate, and stay informed about the trends leading chemical innovation

Join: bit.ly/ACSinnovationhub

41

Make your voice heard!

The Division that works for you, the member

ACS Division of Professional Relations: *A home for all chemists*



<https://acsprof.org>

42



ACS Webinars®

CLICK • WATCH • LEARN • DISCUSS



Learn from the best and brightest minds in chemistry! Hundreds of webinars on diverse topics presented by experts in the chemical sciences and enterprise.

Edited Recordings are an exclusive ACS member benefit and are made available once the recording has been edited and posted.

Live Broadcasts of ACS Webinars® continue to be available to the general public on most Wednesdays and Thursdays from 2-3pm ET!

A **collection of the best edited recordings** from past ACS Webinars will be broadcast on Fridays from 2-3pm ET!

www.acs.org/acswebinars

43



ACS Webinars®
CLICK • WATCH • LEARN • DISCUSS



ACS Webinars® does not endorse any products or services. The views expressed in this presentation are those of the presenter and do not necessarily reflect the views or policies of the American Chemical Society.



Mike Russell Erik

Contact ACS Webinars® at acswebinars@acs.org

44

Free Upcoming ACS Webinars!



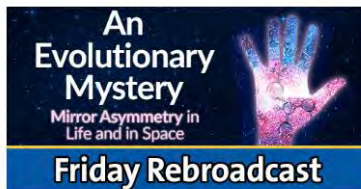
Thursday, July 16, 2020 at 2-3pm ET
 Speaker: Lawrence Silverman, University of Virginia
 Moderator: Heather Clark, Northeastern University

[Register for Free!](#)

What You Will Learn

- What are the common devices and what metrics do they provide
- What is the science behind these metrics
- What does the scientific literature report regarding these claims

Co-produced with: Partnership for Clean Competition and ACS Sensors



Friday, July 17, 2020 at 2-3pm ET
 Speaker: Brett McGuire, National Radio Astronomy Observatory
 Moderator: Ryan Fortenberry, University of Mississippi

[Register for Free!](#)

What You Will Learn

- What is the impact of homochirality on biology and chemical evolution
- What are the potential origins of homochirality and what are the challenges in studying possible interstellar origins
- What was the first detection of a chiral interstellar molecule and what are the challenges associated with measuring a potential chiral excess in space

Co-produced with: ACS Astrochemistry Subdivision



Wednesday, July 22, 2020 at 2-3pm ET
 Speakers: Maria Gallardo-Williams, North Carolina State University / Kyle Grice, DePaul University / Michael Seery, University of Edinburgh
 Moderator: Stacey Lowery Bretz, Miami University

[Register for Free!](#)

What You Will Learn

- Various goals and outcomes for online undergraduate laboratory experiences
- Examples of how laboratory goals and outcomes are being fulfilled
- Approaches for planning and assessing online laboratory experiences

Co-produced with: ACS Education

www.acs.org/acswebinars