

STARS Notes

September 2020
Volume 17, Issue 6

Science Teacher Access to Resources at Southwestern



Summer 2020 Event Re-Cap

2020 STARS SUMMER LECTURE SERIES

The COVID-19 pandemic crisis has been a true test of innovation and creativity across the country and in our local communities.

Since March 2020, the STARS Team began working remotely and the race was on to develop online learning opportunities through our Summer Camps.

It was with deep regret that we couldn't host the Summer Research Program (SRP) this year, but we hope that next year conditions will be more favorable to do an in-person experience.

Through Zoom we were able to reach a broader audience and to provide students and teachers access to our summer seminar lecture series, a collection of talks usually reserved to the SRP participants.

By using the Zoom webinar Q&A feature, the lecture participants valued the opportunity to ask our presenters a multitude of questions related to their research.

One recurring and popular question was related to the scientist's career path and what were the decisions they made to pursue a life in biomedical research.

Another theme was how the presenter's research might be translated to understanding the disease process of COVID-19 and if there were any parallels that could be established.

These seminars were also recorded and viewed by thousands afterwards.

Here is a listing of our six part seminar series of lectures:

1. Dr. Nikhil Munshi, Depts. of Internal Medicine and Molecular Biology, *"Establishing cardiac rhythm: What makes the ticker keep ticking?"*
2. Dr. Julie Pfeiffer, Department of Microbiology, *"The power of model systems: Lessons learned from swamp creatures and an eradicated virus."*
3. Dr. Bruce Beutler, Center for the Genetics of Host Defense, *"Mutagenesis in the mouse."*
4. Dr. James Collins, Department of Pharmacology, *"It's no fluke: Using planarians to guide our understanding of parasitic schistosomes."*
5. Dr. Elisabeth Martinez, Department of Pharmacology, *"Histone Demethylases: Roles in Transcriptional Adaptation and Therapeutic Resistance."*
6. Dr. Todd Roberts, Department of Neuroscience, *"Vocal Learning, Brain Plasticity and the Remarkable Songbird."*



Dr. Beutler, 2011 Nobel Laureate,
presenting via Zoom

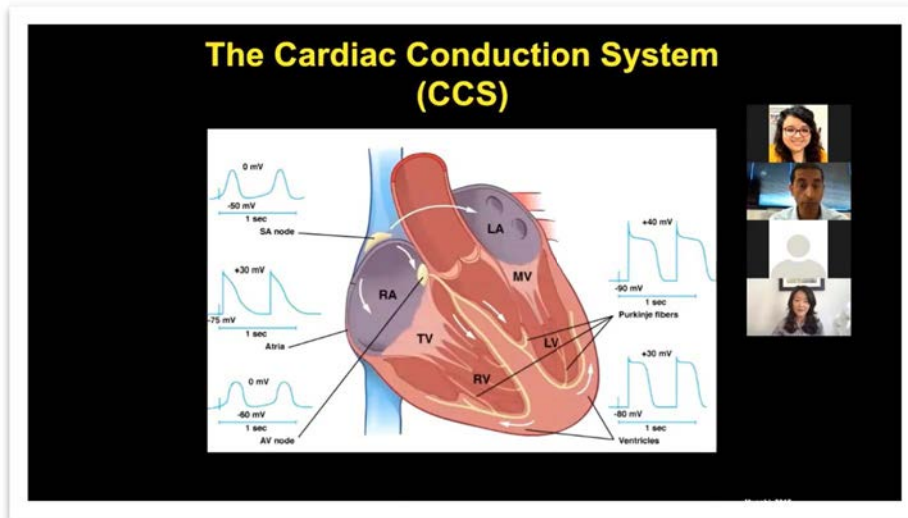
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SPECIAL POINTS OF INTEREST

- Core funding for the STARS Program is provided by the State of Texas
- All STARS Programs are provided free of charge to students and teachers

Summer Seminar Series

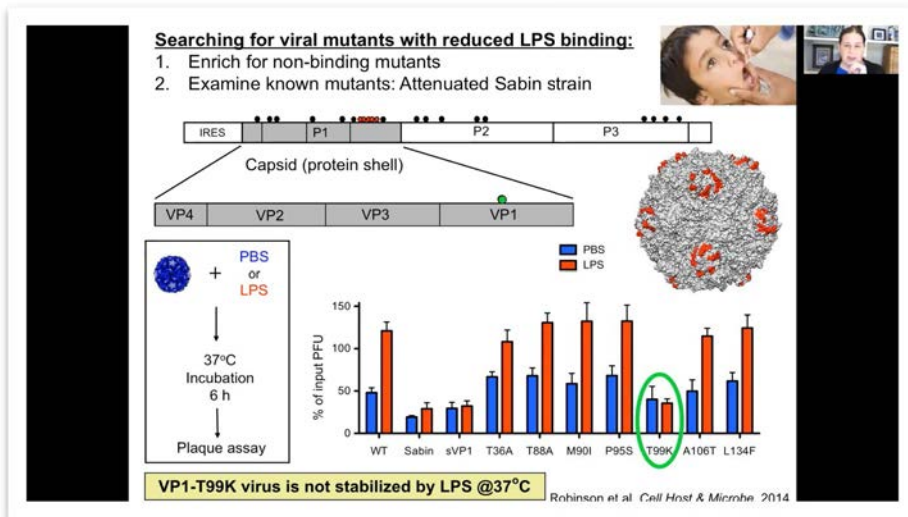


OUR PRESENTERS:

Nikhil Munshi, M.D., Ph.D., is an Associate Professor in the Department of Internal Medicine at UT Southwestern.

He serves as the Assistant Director of the Division of Cardiology's Physician Scientist Training Program and specializes in general cardiology.

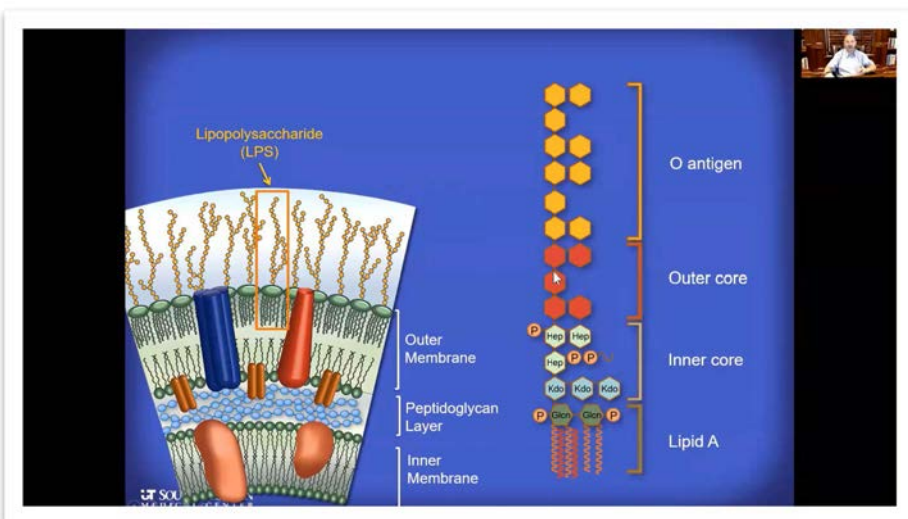
Dr. Munshi's research focuses on cardiac rhythms in health and disease.



Julie Pfeiffer, Ph.D., is a Professor in the Department of Microbiology at UT Southwestern.

Dr. Pfeiffer's research focuses on understanding virus-host interactions that impact the development of disease.

Pfeiffer Lab has research projects in areas related to RNA viruses, pathogenesis, viral evolution, viral population dynamics, host barriers, and the effect on intestinal microbiota on enteric viruses.

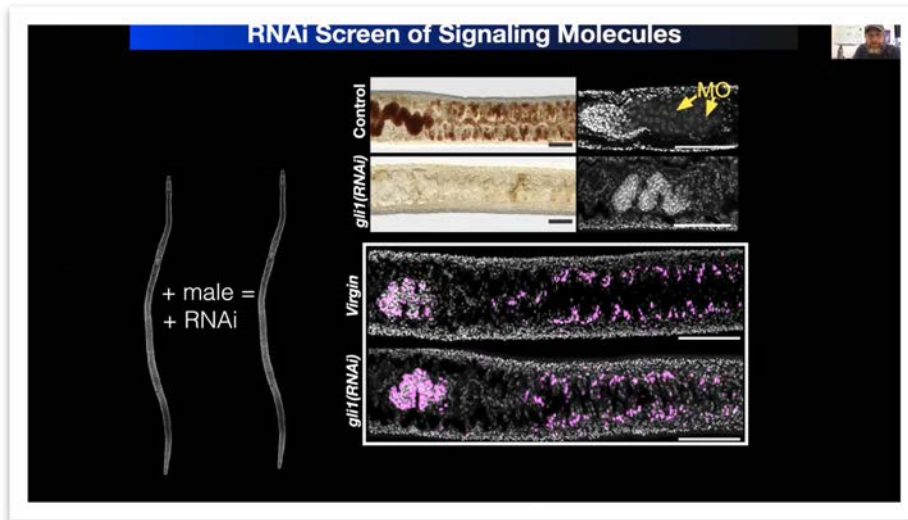


Bruce Beutler, M.D., is the Director for the Center for the Genetics of Host Disease in the Department of Immunology at UT Southwestern.

Dr. Beutler discovered an important family of receptors that allow mammals to sense infections when they occur which triggers a powerful inflammatory response.

For this work, Dr. Beutler received the 2011 Nobel Prize in Physiology or Medicine.

Summer Seminar Series

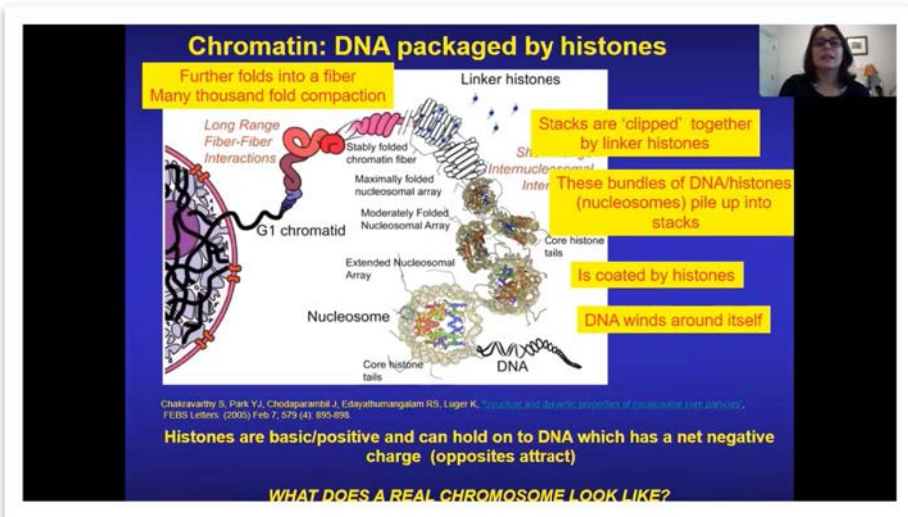


OUR PRESENTERS:

James Collins, Ph.D., is an Associate Professor in the Department of Pharmacology at UT Southwestern.

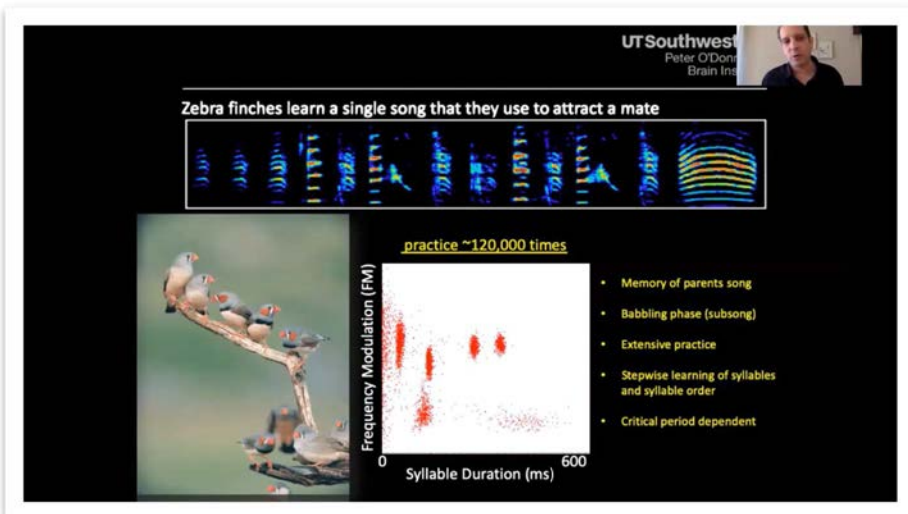
Dr. Collins' research focus is on parasitic flatworms called schistosomes that infect more than 200 million of the world's poorest people and causes a morbidity that rivals malaria and tuberculosis.

Dr. Collins' work aims to create new therapeutic avenues to combat these parasites.



Elisabeth Martinez, Ph.D., is an Associate Professor in the Department of Pharmacology at UT Southwestern.

Dr. Martinez's research interests include: deregulation of transcriptional pathways in cancer, drug discovery, epigenetic control of gene expression, novel therapeutics for gene expression disorders including cancer, the role of Jumonji histone dimethylases in cancer, and transcriptional regulation by nuclear receptors.



Todd Roberts, Ph.D., is an Associate Professor in the Department of Neuroscience at UT Southwestern.

Dr. Roberts' research interests seek to understand the cellular and circuit mechanisms for behavioral learning, learning from social experiences, and from example.

Roberts Lab is interested in identifying the neural circuit mechanisms engaged as juvenile songbirds learn from auditory experience.

Biology Summer Camp

ABOUT THE CAMP

The Biology Camp was first on our list of virtual summer programs conducted via Zoom. The master teachers began planning their curriculum as soon as April to decide which labs and activities they wanted the students and teachers to delve into.

Some of the topics that were covered include:

- Cell Transport
- Energy, Chemical Reactions, and Enzymes
- Cellular Respiration
- Protein Synthesis

Our new master teachers this year are Ms. Cathy Toups (Wakeland High School) and Ms. Kirsten Lindsay-Hudak (Ursuline Academy of Dallas).



Biology Summer Camp

BIOLOGY CAMP 2020 TEACHERS

Adriana Berkhalter—Seagoville High School

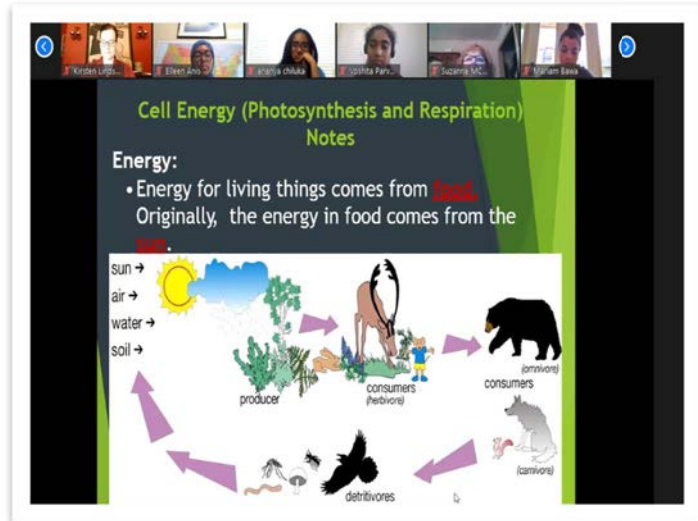
Lindsey Hranitzky—Lake Highlands High School

Suzanne McCall—Sam Houston High School

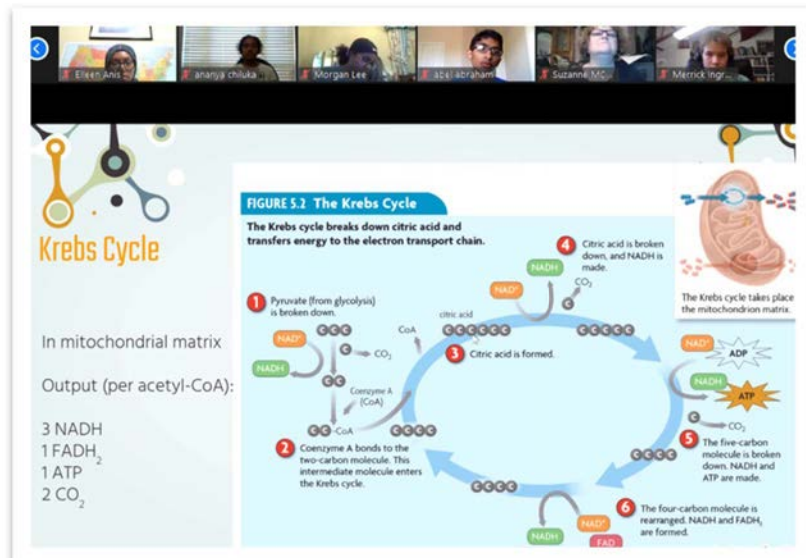
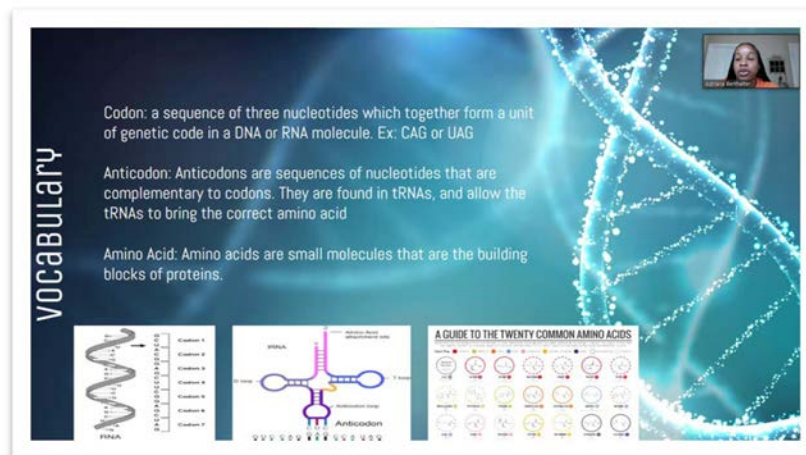
Corey Nieman—Mansfield High School

Katrina Thomason—Scurry Rosser High School

Vickie Reed—Horn High School



While having lessons over Zoom, teachers were able to use interactive tools like Kahoot and Socrative to allow students to engage with their presentations



Biology Summer Camp

A usual day for the Biology camp students began at 9:00am, with signing into Zoom and taking part in morning activities like a pre-quiz and warm up exercise.

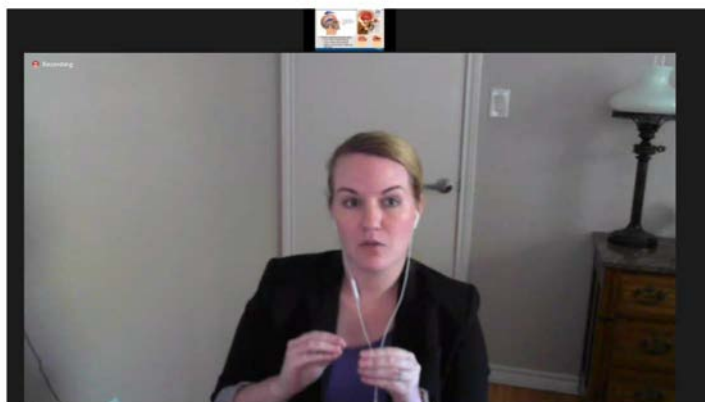
In a short time they would be introduced to concepts like biomolecules and semi-permeable membranes.

In the afternoon, they attended scientific career lectures by UT Southwestern faculty and students such as Aakash Gandhi, a student in the UTSW Medical Science Training Program (MSTP), who presented information on the process of scientific publishing.

He also spoke about bioRxiv (pronounced “bio-archive”), a popular scientific paper preprint server for biology that has often made the news for information related to COVID-19 research.



Aakash Gandhi, UTSW MSTP Student



Dr. Elizabeth Davenport
Assistant Professor of Radiology and the Advanced Imaging
Research Center

Another presenter for the Biology students was Dr. Davenport who gave information about her research into traumatic brain injuries and head impact exposure in contact sports, especially those involving high school athletes.

The American Association of Neurological Surgeons states that among American children and adolescents, sports and recreational activities contribute to 21% of all traumatic brain injuries.

Dr. Davenport explained the differences in human and animal anatomy since some animals like the woodpecker do not experience brain injuries.

She also discussed with the students how her background in biomedical engineering led to her current profession.

Middle School Summer Camp

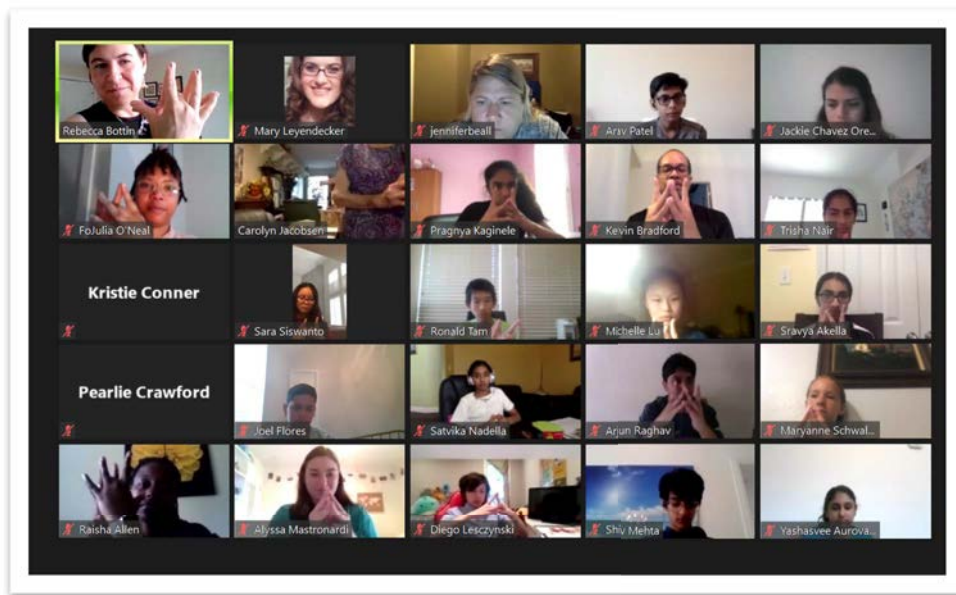
ABOUT THE CAMP

The new Middle School Camp was second on our list of virtual summer programs conducted via Zoom. In this pilot program, 30 6th and 7th grade students were chosen to participate along with eight teachers.

Some of the topics that were covered include:

- Virtual Microscope Use
- Dichotomous Keys
- Phylogenetic Tree Creation
- Law of Conservation of Mass

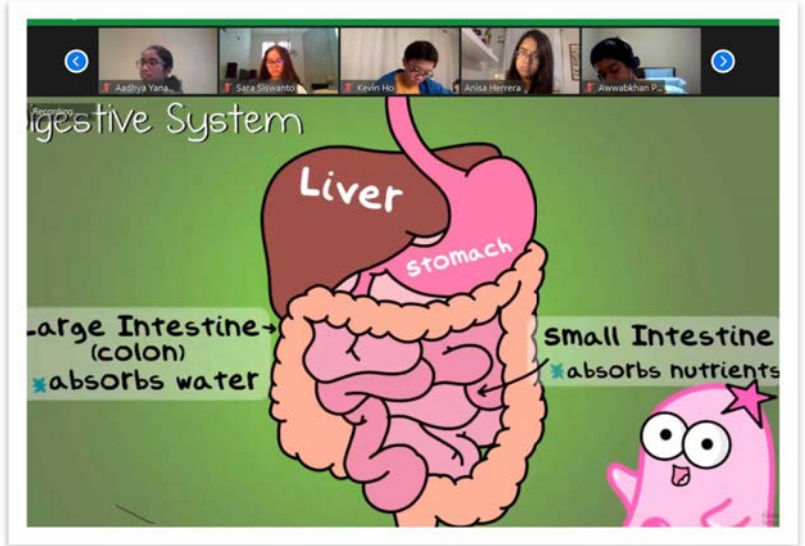
Our new master teachers this year are Ms. Rebecca Bottin (Rice Middle School) and Ms. Jennifer Beall (Renner Middle School).



Middle School Summer Camp

MIDDLE SCHOOL CAMP 2020 TEACHERS

Raisha Allen—DeSoto East Middle School
Kelvin Bradford—Skyview Elementary
Jacqueline Chavez Orellana—Uplift Peak Preparatory
Alyssa Mastronardi—Uplift Peak Preparatory
Zulema Martinez—McDonald Middle School
Shantel Miles—Jacquet Middle School
FoJulia O’Neal—Lorenzo de Zavala Middle School
Carolyn Jacobsen—County Residential Center



To engage the middle school students in their lessons, educational videos like those from the Amoeba Sisters YouTube channel were a great resource to the teachers.



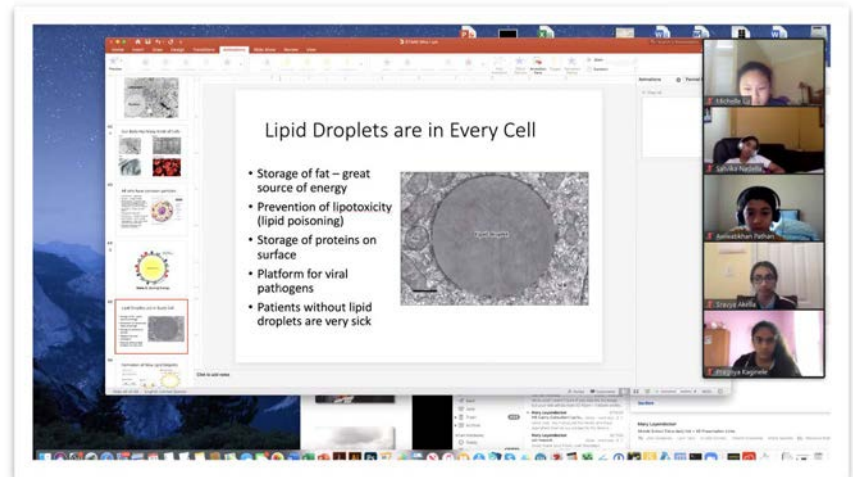
Middle School Summer Camp

STUDENT FEEDBACK TO THE CAMP

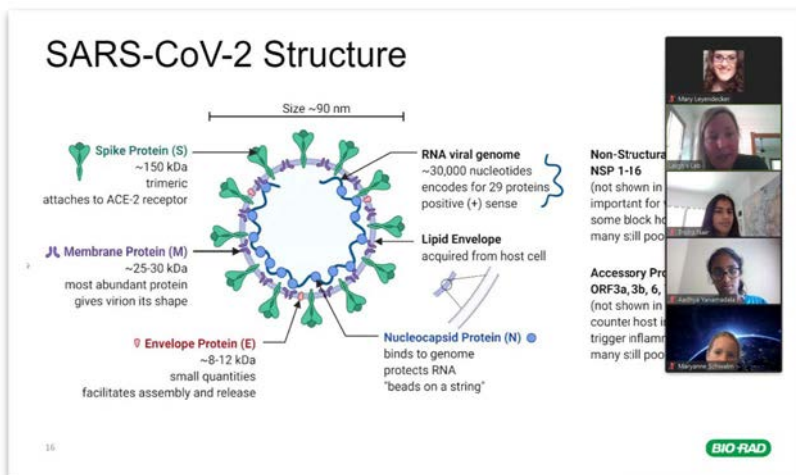
Because the Middle School Camp this year was an entirely new experience, we wanted to ask the students for their opinions so that we could innovate the program for next year.

The large majority of students who responded to our survey at the end of the camp stated that they:

- Felt comfortable learning and working with the other students virtually.
- The lab exercises were fun and interesting.
- They feel better prepared for their upcoming school year and that their overall expectations of the program were met.



In this slide, Dr. Joel Goodman, STARS Director, discusses his lipid droplet research with the middle school students.



Leigh Brown, Curriculum and Training Specialist at Bio-Rad, spoke to students about her career as well as details about SARS-CoV-2.

It isn't often that you have a chance to ask someone who has a background in working with coronaviruses your burning questions about what makes them work and how we as a population can deal with the current effects of the pandemic.

Students were interested to know if it is possible to become re-infected twice, how viral mutations are tracked, and what would be possible economic implications of the virus in communities.

Leigh Brown has been a fantastic friend to the STARS Program and has lead several teacher in-service programs. For the 2020-2021 lecture season, Leigh will lead our second Teaching CRISPR educational event.

Chemistry Summer Camp

ABOUT THE CAMP

The third program we hosted this summer was our Chemistry Camp. This year we had 18 returning students who previously completed our Biology Camp.

Some of the topics that were covered include:

- Chemical Reactions
- Mole Concepts
- Stoichiometry
- Thermodynamics

Our master teachers for the Chemistry Camp are Mr. Rachmad Tjachyadi (Hebron High School) and Dr. Beverly Lawson (The Hockaday School).



Chemistry Summer Camp

CHEMISTRY CAMP 2020 TEACHERS

Aaron Anderson—Spence Talented/Gifted Academy

Ann Marie Burgess—Jacquet Middle School

Bernardo Camacho—Woodrow Wilson High School

Amy Granger—Sam Houston High School

Marilen Juntado—Bland High School

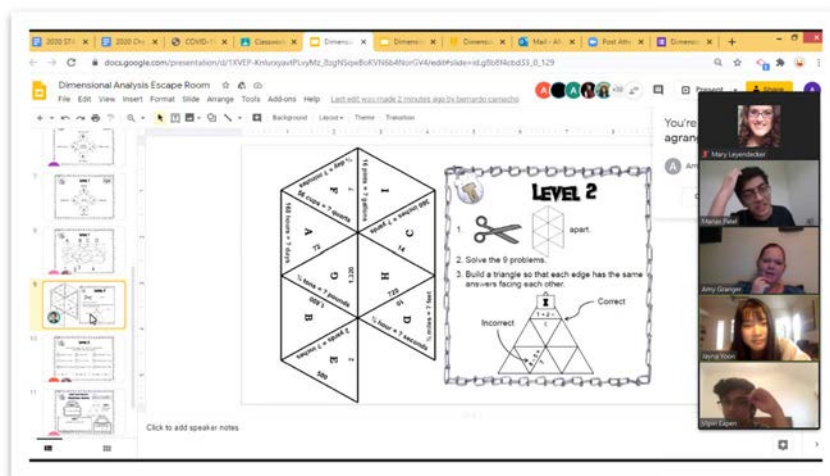
Marie Mathai—Universal Academy - Coppell

Yousef Najim—Justin F. Kimball High School

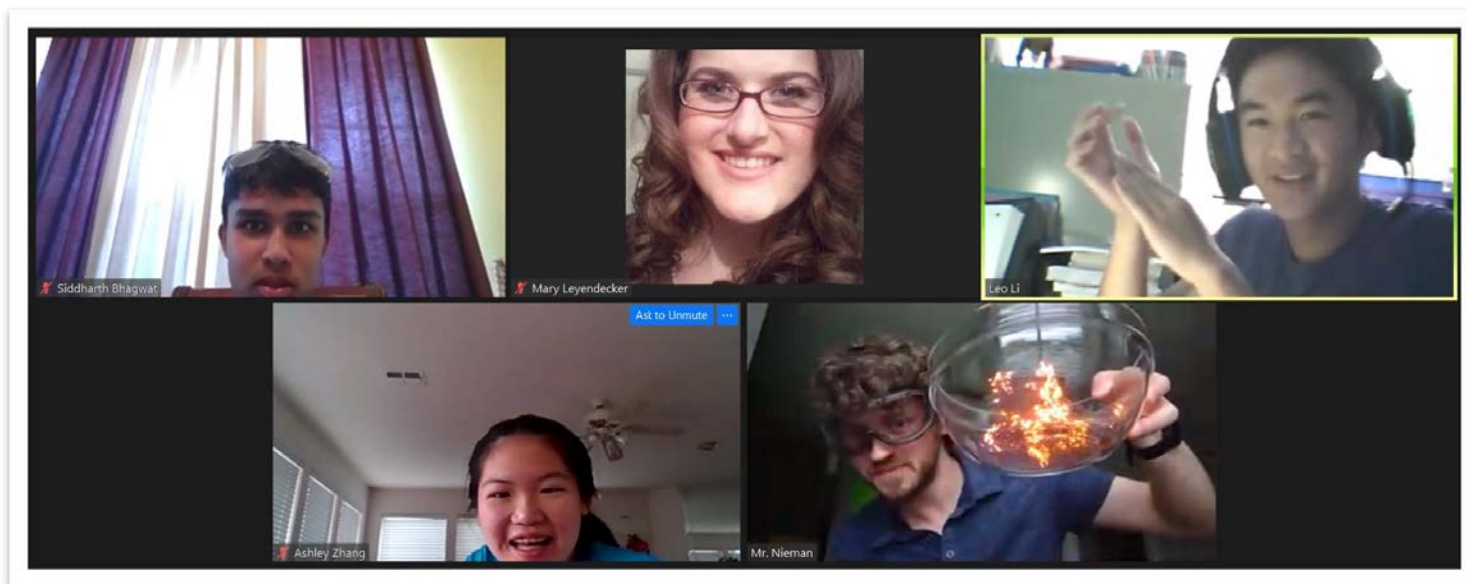
Corey Nieman—Mansfield High School

Farhana Razzaque—Imagine International Academy of North Texas

Yang Welty—Skyline High School



In addition to Socrative and Kahoot, Chemistry teachers used Nearpod and escape room lessons made on Google Slides to help students practice their skills in real time.



Corey Nieman demonstrates how a 9V battery is effective at lighting steel wool on fire in an online lab experience.

Chemistry Summer Camp

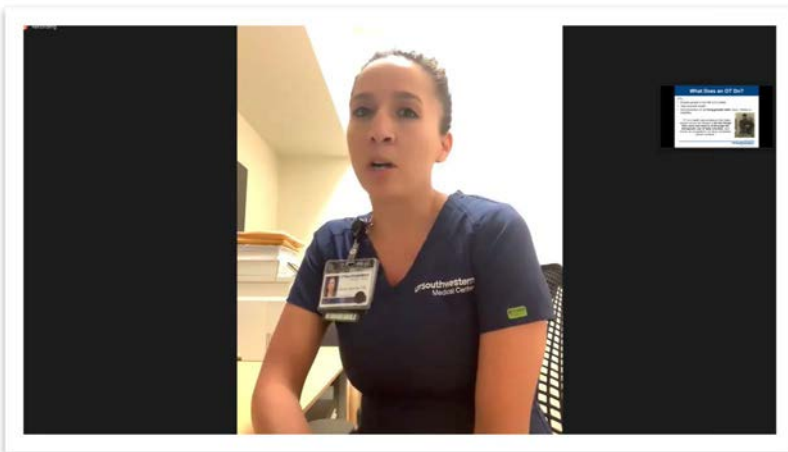
Christine Chen, UT Southwestern Medical Student and 2012 SRP alumna, spoke to the Chemistry students about her path to applying to medical school and ways to possibly become involved in university volunteer opportunities to gain a global understanding of issues people face in their lives.

Christine answered questions related to how to decide upon a major of study and shared her knowledge about how to go about pursuing post-baccalaureate studies.

Additionally, Christine explained in her presentation that there are over 135 medical specialties and subspecialties that can be pursued after medical school and also that the path to medical school can take many turns along the way. The members of her cohort come from a huge variety of life backgrounds and life stages.



Christine Chen, UTSW Medical Student



Alanna Aguirre, OTR/L, MOT

A patient has the chance to experience many health care practitioners during the implementation of their care plan. One of those practitioners may be an occupational therapist like Alanna Aguirre.

An occupational therapist, she explained to the Chemistry students, is an individual who uses assessments and interventions to help a patient either develop, recover, or maintain the things they want and need to do. Occupations are defined as meaningful, everyday activities such as getting dressed or writing.

In her presentation, Alanna spoke about the series of steps that are necessary to become a fully licensed occupational therapist.

Physics Summer Camp

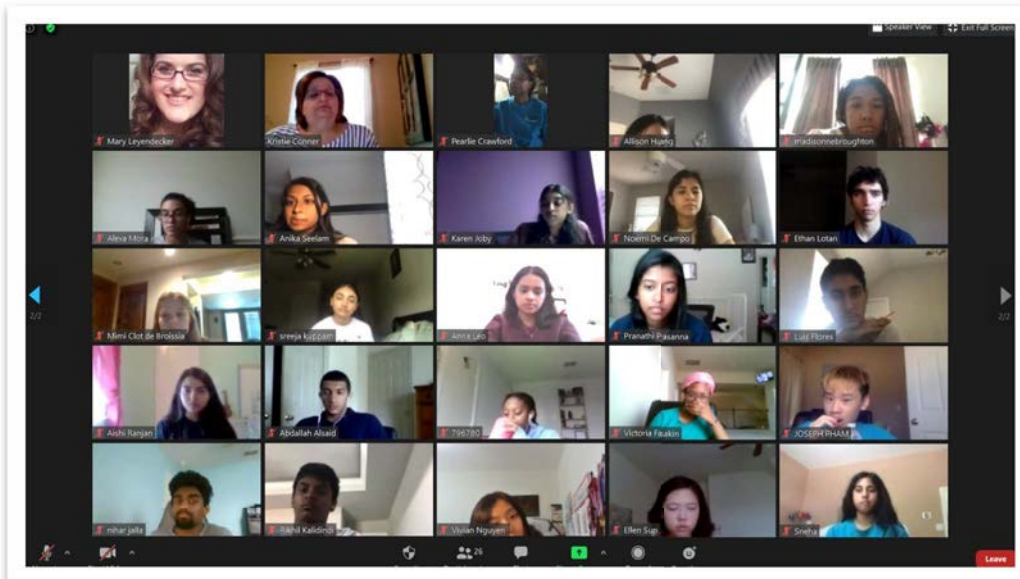
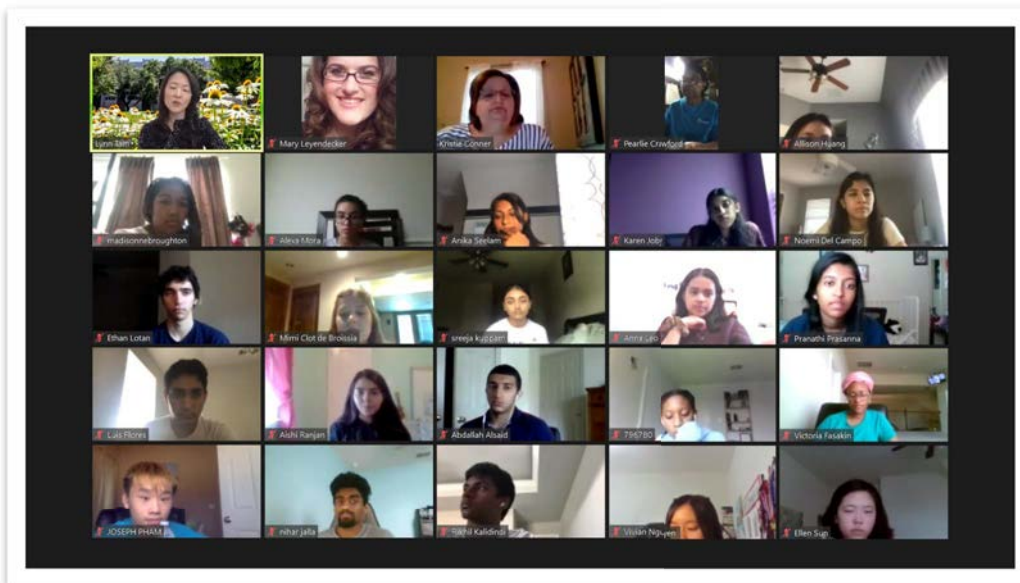
ABOUT THE CAMP

The fourth program we hosted this summer was our Physics Camp. This year we had 12 returning students who previously completed our Biology and Chemistry Camps.

Some of the topics that were covered include:

- Motion
- Simple Harmonic Oscillation
- Resonance
- Electricity

Our master teachers for the Physics Camp are Dr. Kenneth Hahn (John Brown University) and Fred Hurst.



Physics Summer Camp

PHYSICS CAMP 2020 TEACHERS

Marie Mathai—Universal Academy - Coppell

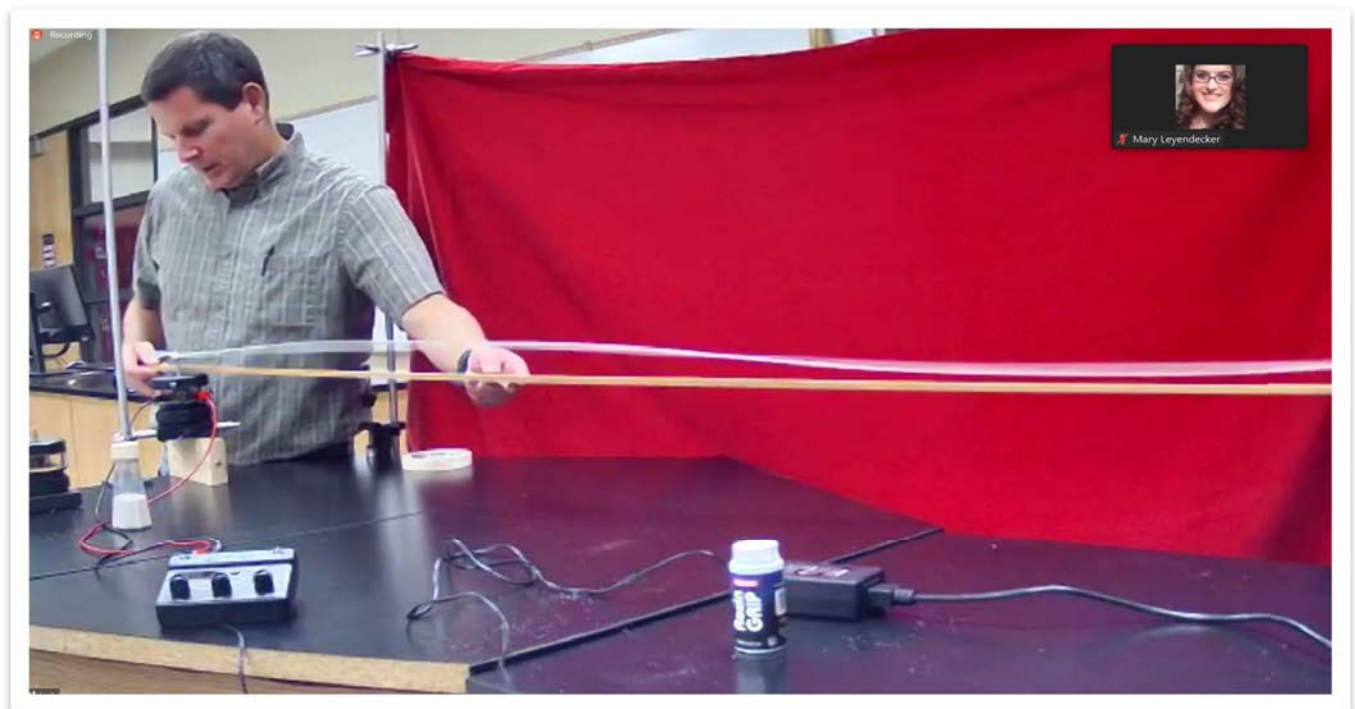
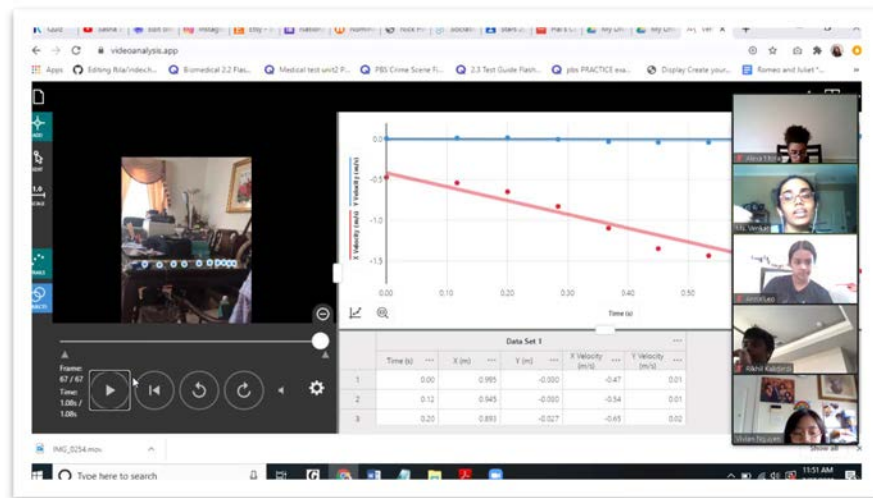
Yousef Najim—Justin F. Kimball High School

Cynthia Maye—Workman Junior High School

Kaylene Thomas—New Caney High School

Meenakshi Venkatachalam—Irma Rangel Young Women's Leadership School

Vickie Reed—Horn High School



Dr. Hahn uses his university lab in Arkansas to demonstrate the properties of a wave.

Physics Summer Camp

The STARS Program has for many years held a collaborative partnership with the Boy Scouts of America Learning for Life Exploring Program, an opportunity where students can learn from professionals like Alex Abellera about careers, especially those in STEM.

Alex has personal experience with the Exploring Program as it was pivotal in helping him decide that he wanted to pursue a life in emergency response.

Alex spoke to the Physics students about what being an EMT is like and the differences between being an EMT and a paramedic. He also spoke about his experiences in performing natural disaster emergency response.



Alex Abellera, Operations Supervisor, Acadian Ambulance

Shanivi Srikonda was our second SRP Alumna who was invited to speak to the camp students this summer. Alumna, especially those who are becoming new undergraduate students, are able to speak candidly about their research and the experiences they had during their internship.

Shanivi spoke to the Physics students, who are rising high school Juniors, about her research project over the “Role of Poly(ADP-Ribose) Polymerase 1 in Trophoblast Differentiation” and answered questions about what a typical day would be like for her in the lab.

Shanivi also detailed what it was like to apply to Ivy League schools and how she handled their interview processes, especially during the early months of the pandemic.



Shanivi Srikonda, 2019 SRP Alumna, 2020 Irving HS Valedictorian, and Class of 2024 - Harvard University

Calendar of Events 2020 — 2021



Mini-symposium

Coronavirus and Climate Change: Approaching Two Existential Threats
 Monday, Sept. 14, 2020
 6:00pm — 8:00pm
 Zoom

Special Symposium

2020 Careers in Biomedical Sciences
 Sat., Sept. 19, 2020
 8:45am — 12:30pm
 Zoom

September 2020						
1						
	14		19			
						30

October 2020						
	1					
			3			
						31

Basic Science Symposium

Using Genetics and Model Organisms to Understand Human Disease
 Saturday, Oct. 3, 2020
 9:00am — 1:00pm
 Zoom
 Please invite students to attend; all participants must pre-register and confirm registration

Mini-symposium

The Science and Treatment of Movement Disorders
 Monday, Nov. 16, 2020
 6:00pm — 8:00pm
 Zoom

November 2020						
						1
			16			
						30

December 2020						
1						
					5	
						31

In-Service

Chemistry Labs Made Easy
 Saturday, Dec. 5, 2020
 9:00am — 3:00pm
 Zoom
 Limited Enrollment

Mini-symposium

Gut Inflammation
 Monday, Jan. 11, 2021
 6:00pm — 8:00pm
 Zoom

January 2021						
						1
			11			
						31

February 2021						
					6	
						27

In-Service

Teaching CRISPR II
 Sat., Feb. 6, 2021
 9:00am — 3:00pm
 Zoom
 Limited Enrollment

Special Symposium

Women in Science and Medicine
 Sat., Feb. 27, 2021
 9:00am — 3:00pm
 Zoom
 Female student focused
 Male students are also invited. All participants must pre-register and confirm

To Register for an Event

STARS events are offered FREE of charge to Texas teachers.

Please register for an event at least two weeks in advance on our website

utsouthwestern.edu/STARS/register

Other Important Dates:

December 1, 2020

Application opens for STARS Summer Research Program

February 1, 2021

Application deadline for STARS Summer Research Program

TBA

Summer Research Program begins

TBA

Summer Research Program ends

March 2021						
1						
						31

April 2021						
						1
			5			
						30

May 2021						
						1
						31

June 2021						
	1					
						30

July 2021						
						1
						31

August 2021						
						1
						31



Social Media Channels:

FB: @utswstars

Twitter: @utswstars

IG: @stars_utsw



QR Code for STARS linktree

UT Southwestern Exploring Post and Club

Upcoming Meetings: 6:00PM – 7:30PM

9/28/2020: MSTP Students

10/19/2020: Abbot WSTEM Group — Medical
Devices

11/14/2020: Medical Exploring Experience,
8:45am-12:45pm

12/14/2020: TBA

1/25/2021: TBA

2/22/2021: TBA

3/22/2021: TBA

4/19/2021: TBA

5/17/2021: Dr. Vinita Hajeri, UT Dallas

The explorers will meet monthly using Zoom.

Interested students may attend once for free.

Yearly Exploring membership is \$42.00.

Online membership registration and scholarships are
available.

Parents are welcome to view the presentations!

For more information visit:

www.utsouthwestern.edu/stars

Programs > Exploring Club and Post

- Learn about careers in science and medicine.
- Meet and network with professionals in different areas of medicine.
- Meet students from different DFW schools that share a passion for health careers and science.



Facebook: @utswstars

IG: @stars_utsw

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STARS Programs

SYMPOSIA

Basic Science Symposia
Mini-symposia

OUTREACH

Bureau of Science Fair Judges
Research Assistance
Science Ambassadors
Student Mentoring

SUMMER RESEARCH

Summer Research Program for Teachers
Summer Research Program for Students

VIRTUAL TOURS

UT Southwestern School of Health Professions
UT Southwestern Medical Center
Parkland Health and Hospital System of Dallas
Children's Medical Center — Dallas

IN-SERVICE SESSIONS

Chemistry Labs Made Easy
Teaching CRISPR II

SUMMER SCIENCE CAMPS

Biology
Middle School
Chemistry
Physics

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