

STARS Notes

May 2019
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Science Teacher Access to Resources at Southwestern

Fall 2018 Event Re-Cap

BASIC SCIENCE AND MINI-SYMPOSIA

STARS SYMPOSIA consist of a series of lectures given by scientists and physicians currently doing research at UT Southwestern Medical Center and affiliated institutions. The science symposia and in-service sessions are excellent resources for teachers to learn about cutting-edge research in the biomedical sciences, to discover new classroom activities, and to obtain professional development credit at the same time. If you wish to attend any event, please pre-register by visiting our online registration page at www.utsouthwestern.edu/STARS/register

Our first mini-symposium of 2018 began with **Inferring Protein Function from DNA** that took place on September 10th. Dr. Vincent Tagliabracci, Assistant Professor, Molecular Biology lead the symposium by presenting his research on “*Expanding the Kinome*” followed by “*Know Thy Self, Know Thy Enemy: Mechanisms of Human Disease Gleaned from Bacterial Pathogens*” presented by Dr. Neal Alto, Assistant Professor, Microbiology. Closing remarks were provided by Dr. Joel Goodman, STARS Director and Professor of Pharmacology.

On the heels of the mini-symposium came our all-day Basic Science Symposium over **Autism Spectrum Disorders** on October 13, 2018. The morning presentation session started with Dr. Cassandra Newsom, Associate Professor, Psychiatry giving an introductory talk with “*What is Autism?*” Soon after,

Dr. Gena Konopka, Associate Professor, Neuroscience presented “*Autism Pathophysiology: Neural Transcription Networks*.” Following Dr. Konopka was Dr. Maria Chahrouh, Assistant Professor, Eugene McDermott Center for Human Growth and Development, Neuroscience, Psychiatry with a presentation over “*The Genetics of Autism*.” Lastly, Drs. Katherine Bellone and Stephen Elliott, Associate Professors, Psychiatry with information over the “*Diagnosis and Treatment of Autism*.” In the afternoon, five groups of participants attended breakout sessions over the following topics: “*Neural Circuits*” Dr. Christine Ochoa, Postdoctoral Researcher Fellow, Neuroscience; “*Behavioral Evaluation and Treatment*” Hayden Mbroh and Savanna Sablich, Graduate Student Researchers, Clinical Psychology; “*A Blood Test for Autism*” Dr. Dwight German, Professor, Psychiatry; “*Choose Your Haystack: Different Approaches for Finding Autism Genes*” Islam Oguz Tuncay, Graduate Student Researcher, Neuroscience; “*Inhibition of Clathrin-mediated Endocytosis*” Dr. Zhiming Chen, Postdoctoral Researcher, Cell Biology.

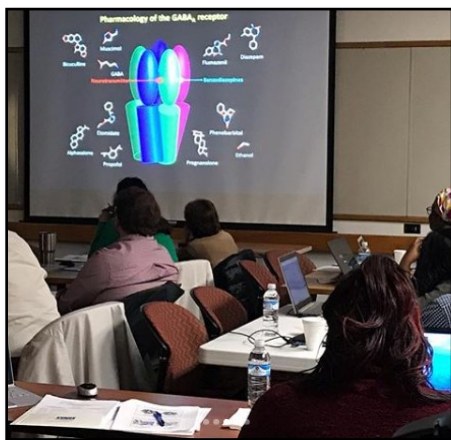
The last mini-symposium of 2018 was focused on **Immunotherapy** and took place on November 5th. Dr. Yang-Xin Fu, Professor, Pathology, Immunology, Radiation Oncology began the event with a presentation over “*Adapting Conventional Therapies to Immunotherapy: Challenges for Personalized Medicine*” followed by “*Cancer Immunotherapy: Clinical Considerations*” by Dr. David Gerber, Professor, Internal Medicine, Clinical Sciences. Dr. Melissa Ellerman, PDA Outreach Committee Co-Chair, and Haley Barlow, SPEaC Representative, spoke to the participants about The Science Policy, Education and Communication (SPEaC) Club and the Postdoctoral Association at UT Southwestern (PDA).

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SPECIAL POINTS OF INTEREST

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



Teachers learned about the GABA_A structure from Dr. Ryan Hibbs. The Hibbs laboratory is pursuing atomic-scale mechanisms of synaptic proteins, with a current focus on ligand-gated ion channel structure and function.

TEACHER IN-SERVICE: VISUALIZING THE MOLECULES THAT DRIVE BIOLOGY

On December 8, 2018 our teacher in-service consisted of a workshop on Incorporating Structural Biology into the Classroom.

Dr. Michael Reese, Assistant Professor, Pharmacology, Biochemistry, introduced the topic of macromolecular structure and additionally provided detailed lectures over cytoskeletons, molecular motors, and rational drug design.

Dr. Eva LaDow, Senior Lecturer at UT Dallas, Neuroscience presented information to participants over incorporating structure into a classroom. Dr. Ryan Hibbs, Assistant

Professor at UT Southwestern, Neuroscience, Biophysics, discussed the GABA_A structure and neuropharmacology.

Participants performed four activities over PyMOL basics, cytoskeletons and motors, the GABA_A structure, and rational drug design.



Dr. Michael Reese

Uplift Education Science Fair 2019

ABOUT THE EVENT

The 9th Annual Uplift Science Fair took place at the T. Boone Pickens Biomedical Building at UT Southwestern Medical Center on January 26, 2019. It is a network-wide event that hosted 203 projects, 285 student attendees, approximately 500 family attendees, 69 judges, and a combination of 56 volunteers and Campus Fair Coordinator attendees with collaboration from the STARS Program.

The students, known to Uplift as scholars, competed to advance to the regional science fair as their families and other students attended breakout sessions while the judges reviewed their projects.

The event is comprised of three major portions: Primary School Competition, Middle School Competition, and High School Competition.

PHOTOS FROM THE FAIR



High School STARS Award Winners pictured with — far left: Richard Harrison, Uplift Education Chief Academic Officer; far right: Lynn Tam, M.Ed., STARS Assistant Director



Primary Judging



Physics Breakout Session

Dallas Independent School District 2019 STEM Expo

Dr. Goodman pictured with Janavi Chadha during the DISD STEM Expo award ceremony



Dr. Goodman pictured with Eric Flores and Gabriel Vargas during the DISD STEM Expo award ceremony

The Dallas ISD STEM Expo was held this year at the Kay Bailey Hutchison Convention Center on February 2, 2019. The event holds the title of being the largest STEM Expo in Texas. Thousands of students, their families, and teachers came to learn about diverse fields within the STEM disciplines.

Students were exposed to a myriad of presentations and exhibits from 3D Printing, architecture, aviation and space, engineering in the oil and gas field, coding and circuitry, augmented reality software, and drone technology, to name a few.

Students learned how to calculate their own carbon footprint and attendees had the option to receive blood pressure and vision screenings.

There were also seven district championship competitions at the Expo such as the Math Olympiad, VEX Robotics, Digital Tech Fest, Bridge Building, First Lego League, First Lego League Jr., and chief among them the Science Fair where several STARS Staff members were in attendance.

245 projects were entered with 218 student attendees, approximately 500 parents and family members, 17 UT South-

western Medical Center judges, with 60 DISD campuses represented.

Dr. Goodman, Kristie Conner, and Pearlle Crawford held a booth and demonstrated a fun exercise to students in which they were given a “rainbow straw” created from mixing vinegar and sodium carbonate with a universal indicator which demonstrates a vibrant rainbow density column.

Dr. Goodman presented the UT Southwestern STARS Award to two groups of students. In the project category for Environmental Engineering, Janavi Chadha and Jacob Acosta won the award for their work over “*Using Environmental Sensors to Optimize Urban Farming Choices.*” The second award was given to Eric Flores and Gabriel Vargas in the Mathematics category for their project in “*Geo Brilliant-ultimate solution to Geometry.*”

For future registration to the Dallas ISD Stem Expo please go to:
<https://www.dallasisd.org/stem>

ABOUT DISD STEM

The Dallas Independent School District has made a conscientious and targeted push towards igniting interest in STEM fields within their student body.

In 2018 the district was actively working on expanding the instruction of computer science to its 151 elementary school campuses.

Robotics clubs are highly popular in DISD and within three years the number of high school clubs has risen to about 250 teams.

STEM career pathways are vast and reach every corner of health, technological and engineering fields. Popular careers include medical scientists, chemists and chemical engineers, atmospheric and space scientists, bioinformatics scientists, and geneticists.

Another type of STEM career title is that of a health and safety engineer who use their knowledge of engineering and health measures to design procedures and systems to keep people and property safe from damage.

To explore job outlook growth percentages and explanations of hundreds of STEM job titles, please go to the Bureau of Labor Statistics’ website at <https://www.bls.gov/home.htm>

References

Smith, C. (2018, January 19). Dallas ISD hosts 'largest STEM Expo in Texas' on Saturday. Retrieved May 21, 2019, from <https://www.dallasnews.com/news/dallasisd/2018/01/19/dallas-isd-hosts-largest-stem-expo-texas-saturday>

Over 30 Popular STEM (&STEAM) Careers and 10 Unusual Ones. (n.d.). Retrieved May 28, 2019, from <https://careerschoolnow.org/careers/popular-stem-careers>

WHAT IS BIOMEDICAL SCIENCE?

Biomedical science is a scientific discipline that merges the fields of biology and medicine together to focus on the health of animals and humans.

Students who choose biomedicine as their major in college study many different topics such as biochemistry, cell and molecular biology, anatomy and physiology, histology, epidemiology, and pharmacology while also gaining hands-on laboratory work while in school.

Biomedical scientists make valuable contributions to existing research literature everyday and are on the cutting edge of medical advancements in the study of cancer, AIDS, and other infectious diseases.

In high school, students who are focused on pursuing a career in biomedicine must obtain a fluency in biology, chemistry, physics, calculus, and trigonometry.

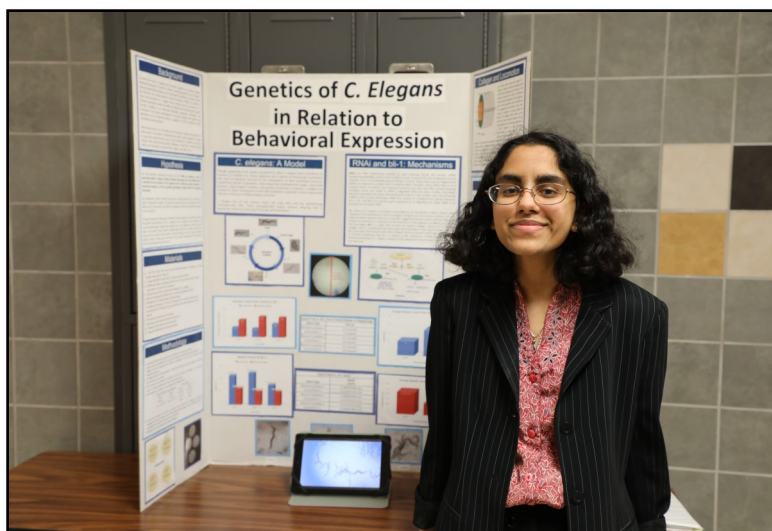
Students must additionally be good communicators and strong writers. Having these traits are extremely necessary to produce coherent and well executed scientific research articles.

Reference:

Biomedical Science. (n.d.). Retrieved May 21, 2019, from <https://www.princetonreview.com/college-majors/427/biomedical-science>

Irving Biomedical Sciences Academy Science Fair

The Irving Biomedical Sciences Academy Science Fair was held on January 24, 2019 and showcased scientific research from their students. 127 projects were entered and 200 students were in attendance. 250 family members came to support the competitors and 40 volunteers lent their efforts towards the logistics of the event. 20 judges from UT Southwestern judged the projects throughout the day.



Shanivi Srikonda pictured with her work over the “Genetics of C.Elegans in Relation to Behavioral Expression”



UT Southwestern STARS Award Winners Shanivi Srikonda and Isaac Ventura pictured with STARS Director Dr. Joel Goodman and Assistant Director Lynn Tam

Future STARS Events Summer 2019

2019 STARS SUMMER RESEARCH PROGRAM

This summer, STARS will have 64 participants (six teachers and 58 students) in the Summer Research Program. This eight week program is designed to give teachers and students an opportunity to work side by side with a faculty host in a research laboratory. An important function of this program is to help teachers rekindle their love of science and to encourage students in North Texas to pursue science related fields. Teachers give poster presentations and develop classroom activities related to their research experience. Students give poster presentations and act as emissaries at their schools the following year by giving talks outlining their research. The summer experience takes place in biomedical research laboratories only and does not include any clinical or shadowing opportunities. Participation is limited by funding resources.

2018 SRP STUDENTS AND TEACHERS



To learn about prior biomedical research projects, please visit our website.

2019 STARS SUMMER SCIENCE CAMPS

The STARS Summer Science Camps for rising 9th, 10th, and 11th grade students and middle and high school teachers are two week non-residential summer camps where students learn concepts through hands on labs, health careers information, project based challenges, and science lab tours.

- I. Biology — June 6th (teachers) / June 10th (students); camp ends June 21st
- II. Chemistry — June 26th (teachers) / June 28th (students); camp ends July 12th
- III. Physics — July 17th (teachers) / July 22nd (students); camp ends August 2nd



2018 Biology Summer Camp



2018 Chemistry Summer Camp
Teachers

EXPLORING POST AT UT SOUTHWESTERN

The explorers (Post — high school students, Club — middle school students) meet monthly at UT Southwestern Medical Center in Lecture Hall D1.502 from 6:00pm to 7:30pm. Interested students may attend for free and yearly Exploring membership is \$34. Parents are always welcome!

2019-2020 Exploring Officers

(left to right)
 President: Priya Mandava
 Admin. VP: Gabriela Castaneda
 Programs VP: Nathan Paul
 Secretary: Nicholas Hirai



SUMMER CAMP INFO

To participate in the summer camps, students and teachers must complete an application process. The application time frame begins in mid-February and ends on April 1st every year.

Breakfast and lunch are provided to all participants in the camps. STARS does not provide transportation; participants are responsible for their daily transportation to and from the camp.

Future Monday Exploring Dates:

9/23/19
 10/21/19
 11/16/19
 12/16/19
 1/27/2020
 2/17/20
 3/23/20
 4/20/20
 5/18/20

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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

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

Biology Labs Made Easy
Teaching CRISPR

SUMMER SCIENCE CAMPS

Biology
Chemistry
Physics

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