

THE CAPITAL CHEMIST

A Publication of the Chemical Society of Washington Section of the American Chemical Society

Join Us At the Next CSW Dinner Meeting on 3/12

Join us on Thursday, March 12th, for the Chemical Society of Washington (CSW) dinner meeting, including presentation of the Hillebrand Prize and Gordon Award.

Dr. Terrence R. Burke, Jr. is being presented the 2019 Hillebrand Prize for his many contributions to medicinal chemistry that have significantly advanced several areas of biomedical-related research.

Dr. Philip R. DeShong is being presented the 2019 Charles L. Gordon Memorial Award given in recognition of exemplary service by a CSW member to the profession of chemistry, to the science of chemistry, and/or to the Chemical Society of Washington.

Following the awards presentation, Dr. Terrence Burke will present a seminar on his work developing HIV-1 integrase inhibitors:

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Inside this issue:

- Join us for the next dinner meeting
- Discover several volunteer opportunities in the DMV
- Learn more about this year's Chemists Celebrate Earth Day theme, and how to participate
- Submit an abstract for MARM
- Participate in the High School Chemistry Olympiad



Dr. Terrence Burke
Head, Bioorganic Chemistry Section
Chemical Biology Laboratory
Center for Cancer Research, National Cancer Institute
National Institutes of Health

“Taking a Bead on HIV: Developing HIV-1 Integrase Inhibitors that Are Broadly Effective Against Resistant Viruses”

Abstract

Human immunodeficiency virus type 1 (HIV-1), the causative agent of AIDS, was first isolated in 1983. Since then, approximately 80 million people have been infected with HIV-1 and more than 30 million people have died from AIDS-related illnesses. Approximately 40 million people are currently infected. That number continues to increase, with approximately 2 million new infections occurring every year. There is no cure and without treatment, the average life expectancy is on the order of one decade. HIV-1 is a retrovirus, and like other retroviruses, it encodes three enzymes that are essential for viral replication. Drugs that target these three enzymes are widely used in the combination of anti-retroviral therapies (cART) that have dramatically improved patient outcomes. Drugs directed against the polymerase activity of reverse transcriptase were first developed in the 1980s, and protease inhibitors were developed in the 1990s. However, developing clinically relevant inhibitors of the third viral enzyme, integrase (IN) has been much more difficult. It wasn't until 2007 that raltegravir (RAL) became the first IN inhibitor to receive FDA approval. However, the high mutation rate of HIV-1 (averaging about one mutation per 10 replicative cycles) means that there are some drug-resistant variants already present in a patient when therapy is initiated. To make matters worse, HIV can develop

resistance to all the known classes of drugs. Understanding the resistance mechanisms and developing drugs that are broadly effective against the known resistant variants is an important and ongoing objective of HIV research. In a more than 25-year collaboration with a team of pharmacologists, virologists, and structural biologists, we have worked to develop therapeutically relevant IN inhibitors. Much of this research has been conducted within the Intramural Program of the NIH. Our work has culminated in the discovery of potent IN inhibitors that are not cytotoxic in cultured cells. Some of our best inhibitors retain greater antiviral potency against known drug-resistant mutants than the best FDA-approved IN inhibitors. X-ray crystal structures of our inhibitors bound to the prototype foamy virus integrase and, more recently, cryo-EM structures of our inhibitors bound to HIV-1 IN, have greatly improved our understanding of what makes a broadly effective IN inhibitor. Our findings will inform the design of new IN inhibitors, which may be able to better retain efficacy against resistant mutant forms of IN.

Biography

Dr. Terrence Burke, Jr. is currently a Senior Investigator and head of the Bioorganic Chemistry Section in the Chemical Biology Laboratory, Center for Cancer Research, National Cancer Institute (NCI), National Institutes of Health (NIH). His research utilizes both small molecule and peptide/peptide mimetic syntheses to advance the understanding of the biological process important for the etiology and treatment of cancers and AIDS. He is a native of the Pacific Northwest, having received degrees from St. Martin's University, Lacey, Washington (B.S. in chemistry, 1975) and the University of Washington, Seattle (Ph.D. in Medicinal Chemistry, 1978). He undertook postdoctoral studies at the NIH, first as a Pharmacology Research Associates Training Program (PRAT) Fellow in the National Heart, Lung, and Blood Institute (NHLBI) and then as a Senior Staff Fellow in the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). In 1989, he joined the Laboratory of Medicinal Chemistry, NCI (renamed as the Chemical Biology Laboratory in 2009) as a tenured investigator and in 2003 he became a member of the Senior Biomedical Research Service (SBRS), Department of Health and Human Services (DHHS). He is a recipient of the Sato Memorial International Award (1997) and the NIH Merit Award (2002). His research is documented in more than 300 peer-reviewed publications and twenty issued U.S. patents.

Meeting Logistics

Date: Thursday, March 12, 2020

Time: 6:00 p.m. Check-in/Social Hour
6:30 p.m. Dinner
7:00 p.m. Awards Presentation
7:30 p.m. Presentation

Location: ACS Headquarters – Marvel Hall
1155 16th St., N.W., Washington, DC

Menu: Meal will be catered by Fresh Connections Catering and will feature Prime Rib served au jus, with twice-baked potatoes. Vegetarian Option: Vegan Stuffed Cabbage Rolls (stuffed with brown rice, mixed mushrooms, dried cranberries, onions, and red wine, served with penne marinara). Sides: Salad and artisan bread. Dessert: Mini cupcakes. Assorted beverages will be provided.

Cost: \$26 (Members and guests) / \$13 (Students and High School Teachers)

RSVP by noon Tuesday, March 10, to csw@acs.org (preferred) or by phone (messages only: 202.659.2650). Please provide the names in your party when you RSVP, and if you wish to have the meat or vegetarian option. The public is invited to attend. You may attend the talk only, but reservations are appreciated. If you need any further information or would like to make a reservation, please contact the CSW office by email at csw@acs.org or by voicemail at 202.659.2650.

Parking: Parking is available in nearby commercial parking garages. Please be aware that garage closing times vary. Parking is also available on the street after 6:30 pm, but be aware that most parking meters are in effect until 10:00 pm and may be limited to 2 hours. You should check the individual meters for details and payment

methods as some are no longer coin-operated.

Metro: Blue/Orange/Silver Line: McPherson Square or Farragut West. Red Line: Farragut North

CALL FOR VOLUNTEERS - Parkland Magnet Middle School STEM Night - March 5, 2020

Parkland will be having its annual STEM night on Thursday, March 5, 2020. We are looking for judges for our science projects and presentation or hands-on exhibits to share information. If you are interested in helping please complete the google form by clicking on the link below.

<https://forms.gle/p5eKEt87D6h9EYWE9>

Thank you for your continued support of our aerospace science program.

OSA & IEEE Call for Science Fair Judges, Spring 2020

Please contact Peter Blake by email (peter.blake@nasa.gov) or phone (202-386-1636) to volunteer.

The National Capital Section of the Optical Society and the IEEE Photonics Society Wash/NVA Chapter are looking for special subject judges in optics and photonics for the recognition of outstanding science fair projects at local area science fairs. As a volunteer, you will join with fellow judges to interview the optics and photonics presenters at the fair. Your team will select the "Outstanding Achievement" and "Notable Achievement" optics/photonics project winners.

The Outstanding Achievement students from each Science Fair and their parents will receive invitations to the annual Student Awards banquet in May, where the students will be feasted and honored. This has been a festive and exciting event for many years.

Regional Science Fairs

Anne Arundel

Saturday, March 7, 2020 from 10:30 AM – 3:30 PM

Annapolis High School, 2700 Riva Rd, Annapolis MD 21401

Prince William - Manassas Regional Science Fair

Saturday, March 7, 2020: 8:30 AM. Hot breakfast/lunch provided

Kelly Leadership Center, 14715 Bristow Road, Manassas VA

DC STEM Fair (D.C. Public Schools)

Saturday, Mar 14 Location: Dunbar HS

Prince George's Area Science Fair

Saturday, March 21, 2020, beginning at 8:30

Charles Herbert Flowers High School

10001 Ardwick-Ardmore Road, Springdale, Maryland 20774

Northern Virginia Regional Science and Engineering Fair

Saturday, March 21, 2020, 9:15 check-in breakfast served

Wakefield High School, 1325 South Dinwiddie Street, Arlington, VA 22206

Fairfax County Regional Science and Engineering Fair

March 21, 2020 7:30-8:15am check-in, coffee, and refreshments

Robinson SS, 5035 Sideburn Rd, Fairfax, VA 22032

MONTGOMERY County Science Fair
March 21, 2020 Check-in: 9:30 AM Lunch provided
U.S. Food and Drug Administration, White Oak Campus,
10903 New Hampshire Avenue, Silver Spring, MD 20993

Baltimore Science Fair
March 21, 2020 8:30 a.m, compl lunch
Towson University: the West Village Commons

CALL FOR VOLUNTEERS - USA Science & Engineering Festival - April 24-26, 2020



Join ACS, AACT, and C&EN at the sixth USA Science & Engineering Festival Expo, April 24-26, where sponsors and exhibitors will showcase over 3,000 hands-on activities, amazing stage shows featuring science celebs, and so much more.

Volunteers will conduct simple hands-on activities at the ACS exhibit; talk to festival-goers about ACS, AACT, and C&EN resources; and get a free volunteer t-shirt. Also, invite friends and colleagues to volunteer, and bring your family along for the fun!

Sign up to volunteer: <https://www.signupgenius.com/go/30e0548afa62da0fa7-2020>

ACS Exhibit: Exploring Our World through Chemistry
Walter E. Washington Convention Center, Washington, D.C.

- Friday, April 24 – Sneak Peek Friday – 9:00 a.m. to 3:00 p.m.
- Saturday, April 25 – EXPO – 10:00 a.m. to 6:00 p.m.
- Sunday, April 26 – EXPO – 10:00 a.m. to 4:00 p.m.

Chemists Celebrate Earth Week - April 19-25, 2020



Chemists Celebrate Earth Week
a program of the American Chemical Society (ACS)
Theme: "Protecting Our Planet through Chemistry"

Earth Day 2020 marks the 50th anniversary of the world's largest environmental movement! Chemists Celebrate Earth Week (CCEW) is a community-based program of the American Chemical Society (ACS). ACS will celebrate Earth Day through CCEW 2020 from April 19-25 with the theme, "Protecting Our Planet through Chemistry." ACS and Earth Day Network are creating resources and programs to support ACS members and chemistry enthusiasts in joining the campaign. This annual program unites ACS local sections, student chapters, technical divisions, businesses, schools, and individuals in communicating the positive role that chemistry plays in the world. Earth Day was first officially recognized on April 22, 1970 as a way to demonstrate support for a healthy environment, raise awareness about environmental issues, and remind people that we all need to contribute to a sustainable planet. For years, chemists have been promoting a better world through recyclable plastics, cleaner-burning fuels, phosphate-free detergents, environmental monitoring, and green chemistry initiatives. The ACS joined the Earth Day celebration on April 22, 2003.



The Chemical Society of Washington (CSW) will once again participate in Chemists Celebrate Earth Week (CCEW) activities. Chemistry is all around us and is vital to our planet's sustainability. Whether it's used in recyclable and biodegradable materials or through the reduction of waste, chemistry is involved in ensuring that we can be eco-friendly and kind to our environment. CCEW seeks to bring international focus to environmental causes, such as clean air, water, and energy. ACS offers events, contests, and educational resources for members, chemical educators, and chemistry enthusiasts to illustrate the positive role that chemistry plays in preserving the Earth. The CCEW 2020 theme is "Protecting Our Planet through Chemistry."

This year's theme looks at how chemistry protects and affects the planet. Planet Earth provides humans with the natural resources we need to survive and thrive. Chemistry is the science that has helped us use both renewable and nonrenewable resources to transform our lives. Chemists invent and design many of the materials that make items we use every day, from electronics to medicine. Every day, our actions as humans have impacts on the earth and the environment. Some of these actions are beneficial, while others are not. We can each do our own part to protect the planet by making small changes in our lives, like switching to biodegradable plastics and buying less one-time-use stuff. We want to show you some of the ways chemistry is contributing to cleaning our water, reducing waste, and designing sustainable materials. We hope that you enjoy celebrating Earth Day's 50th birthday during Chemists Celebrate Earth Week 2020, with the theme of "Protecting Our Planet through Chemistry." Remember that actions to protect our planet should be observed and celebrated all year round! The electronic version of the *Celebrating Chemistry* newsletter for CCEW, as well as additional information about this year's CCEW celebration, will be available February 1, 2020 from the ACS website (www.acs.org/ccew).

CCEW Illustrated Poem Contest - Deadline to Submit Entries is April 27, 2020

As part of the Chemists Celebrate Earth Day activities, the American Chemical Society is sponsoring an illustrated poem contest for students in Kindergarten through 12 grades. Students are asked to write and illustrate a poem using the Chemists Celebrate Earth Week 2020 theme, "Protecting Our Planet through Chemistry." This year's theme looks at how chemistry protects and affects the planet. Planet Earth provides humans with the natural resources we need to survive and thrive. Chemistry is the science that has helped us use both renewable and nonrenewable resources to transform our lives. Chemists invent and design many of the materials that make items we use every day, from electronics to medicine. Every day, our actions as humans have impacts on the earth and the environment. Some of these actions are beneficial, while others are not. We can each do our own part to protect the planet by making small changes in our lives, like switching to biodegradable plastics and buying less one-time-use stuff. Your illustrated poem should show some of the ways chemistry is contributing to cleaning our water, reducing waste, and designing sustainable materials. We hope that you enjoy celebrating Earth Day's 50th birthday during Chemists Celebrate Earth Week 2020, with the theme of "Protecting Our Planet through Chemistry."

Detailed rules and guidelines are available on the Chemists Celebrate Earth Day website; www.acs.org/ccew. All Entries must provide the information that the ACS request via the entry form which is available via the ACS or CSW websites and adhere to the rules set by the ACS. The entry form is available from the CSW website (https://capitalchemist.org/wp-content/uploads/2020/02/ccew-poem-contest-entry-form_2020.pdf). Teachers at schools in the Chemical Society of Washington area are encouraged to have a contest at their school and then submit the winning entries from the school to:

Chemist Celebrate Earth Week Coordinator
Chemical Society of Washington
1155 16th Street, NW, Stop O-218
Washington, DC 20036

Electronic submissions should be sent to: Kim.Morehouse@FDA.HHS.GOV All entries must be received by Monday, April 27, 2020 so winners at the local section level can be submitted to the ACS by Sunday May 3, 2020.

View flyer: <https://capitalchemist.org/wp-content/uploads/2020/02/ccew-poem-contest-flyer-2020.pdf>

Rockville Science Day - April 19, 2020

Rockville Science Day
Sunday, April 19, 2020
Noon to 5:00pm
Montgomery College
51 Mannakee St, Rockville, MD 20850

Come and join us at Montgomery College for the 31th annual Rockville Science Day on Sunday, April 19, 2020, featuring a variety of science and technology-related exhibits, activities, games and demos.

Rockville Science Day is intended to provide a friendly environment for students and their parents to participate in some hands-on demonstrations and to learn more about how science and engineering are important to our society. There will be more than 70 exhibitors with hands on activities. Additional information about Rockville Science Day can be found on their website (<http://rockvillesciencecenter.org/rockville-science-day/>).

As part of the celebration of Chemists Celebrate Earth Week, the Chemical Society of Washington, in conjunction with the Chemistry Department at Montgomery College, Rockville Campus will participate in Rockville Science Day once again this year. Rockville Science Day is open to the public and CSW encourages you to attend. This event will be co-sponsored by the CSW Outreach Committee and the CSW

Environmental/Sustainability Committee. Volunteers from CSW will be providing hands on activities for children who attend the event as a part of CSW's participation in Chemists Celebrate Earth Week (CCEW). Volunteers will also hand out copies of the Celebrating Chemistry publication for CCEW, and various CCEW themed products. If you would like to volunteer for this event, please contact the CSW CCEW coordinator, Kim Morehouse (Kim.Morehouse@fda.hhs.gov).

Mid-Atlantic Regional Meeting (MARM) June 12th in New York City

MARM 20/20

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CHEMISTRY IN FOCUS



Abstract Submission Now Open!

2020 Middle Atlantic Regional Meeting | June 12 | New York, NY

Submit your abstract for MARM 2020. The scientific theme of MARM 2020 is Chemistry in Focus. This one-day conference will offer a rich technical program encompassing the chemistry of flavors and fragrances, cosmetics, forensics, life sciences, material science, and the environment. This diverse technical program is coupled with educational and employment programs. The ACS Meeting Abstracts Programming System (MAPS) is now open to receive your abstracts for MARM 2020.

Submit an abstract: https://callforpapers.acs.org/marm2020?sc=200128_mtg_em_regional_MARM_od

Lodging

There is no official housing site for MARM 2020 one-day conference, but there are several hotels within walking distance. Visit the registration page on the MARM 2020 website, to view your transportation and hotel options.

Visit the conference website: https://www.marm2020.org/?sc=200128_mtg_em_regional_MARM_od

CSW Presents the Annual College Achievement Awards at the February 13th Dinner Meeting

Congratulations to the ten students who received the College Achievement Awards for this year:

Ivy Antunes (St. Mary's College of Maryland), Helen Havens Clark (Georgetown University), Deanna Greco (The Catholic University of America), Janelle Junior (The University of the District of Columbia), Favian Liu (American University), Arianna Lopez (American University), Tristan G. Moon (George Mason University), Rohan Shah (University of Maryland College Park), Maximillian Thomas (Georgetown University), and Hana Jensen Yarbrough (St. Mary's College of Maryland).

Read about these students' achievements on the CSW website: https://capitalchemist.org/wp-content/uploads/2020/02/2-13-20_handout-awardees.pdf

Seven students were able to attend and receive in-person their certificates and Amazon gift card, as pictured below.



Photo courtesy of Kim Morehouse

[pictured above, but not in order: Deanna Greco, Janelle Junior, Favian Liu, Arianna Lopez, Tristan Moon, Rohan Shah, Maximillian Thomas]



Photo courtesy of Kim Morehouse

Dr. Willie Vann, pictured with CSW President Darryl A. Boyd, presented, "Capsular Polysaccharide Synthesis in Bacterial Pathogens – A tool box for vaccine development."

2020 High School Chemistry Olympiad

The CSW High School Chemistry Olympiad for 2020 will begin in early February. The letter introducing the Olympiad will be emailed to those high school chemistry teachers for whom we have an email address. This letter will ask for student nominations to take the Local Section Examination at their school during the first two weeks of March. If you are a high school chemistry teacher who wishes to participate in this Olympiad and did not receive the letter in 2019 or participate in past Olympiads, please send an email with your name, your email address, and the name of your high school to cswolympiad@gmail.com. The CSW Co-Coordinator of the Chemistry Olympiad Committee are India James and Regina Cody.

Online registration: https://docs.google.com/forms/d/e/1FAIpQLSdSvRO_GDpJnjgKS75ggdE4lmsabj1d1coxS-Nwf-FVWXF01w/viewform?vc=0&c=0&w=1

Results and information from the 2019 High School Olympiad: <https://capitalchemist.org/wp-content/uploads/2020/01/Capital-Chemist-2019-Chemistry-Olympiad.pdf>

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The **Chemical Society of Washington (CSW)** is the local ACS Chapter for the Washington, DC area and serves approximately 4,000 members.

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CSW Calendar of Events

March 5: Parkland Magnet Middle School STEM Night

March 12: CSW Dinner Meeting

April 19: Rockville Science Day

April 19-25: Chemists Celebrate Earth Day

April 24-26: USA Science & Engineering Festival

April 27: Illustrated Poem Contest Deadline

June 12: MARM