

MOLECULAR SIEVE

Andrews University

Department of Chemistry & Biochemistry

An American Chemical Society Approved Program since 1976

Fall 2019

Sir J. Fraser Stoddart 2016 Nobel Prize Winner

In This Issue:

- 1 Nobel Prize Speaker
- 2 Pathfinder Honor
New Honor Society
Nowack Garden
- 3 ChemClub Officers
Quant Lab Coats
- 4 Awards & Degrees
- 5 Alumni Notes
- 7 STEM Boost
MASAL Conference
BCCE
- 8 From the Chair
Forensic Lab
- 9 2019 Graduates

Faculty:

Lisa Ahlberg, PhD
Ryan Hayes, PhD
Getahun Merga, PhD
Desmond Murray, PhD
David Nowack, PhD
David Randall, PhD

Staff:

Dana Johnston, MS
John Rorabeck, MS
Rebecca Turk, BS

On Thursday, April 18, 2019, Andrews University Department of Chemistry and Biochemistry hosted a visit and lecture by Northwestern University Professor Sir Fraser Stoddart at the Newbold Auditorium in Buller Hall on the campus of Andrews University. This was the final guest lecture in the Department of Chemistry & Biochemistry 2018 – 2019 Dwain L Ford Guest Lecture Series. Sir Fraser shared the 2016 Nobel Prize in Chemistry (with Jean-Pierre Sauvage and Bernard Feringa) for the design and synthesis of molecular machines. His visit to campus was a historic event for the entire University and surrounding community.

The work of Stoddart, Sauvage and Feringa was fundamental to the early development of molecular machines and the concept of the mechanical bond. Sir Fraser lectured on “Engines Through The Ages.” Among the packed auditorium audience of students and community was Dr. Andrea Luxton, Andrews University President and Dr. Christon Arthur, Andrews University Provost.

Despite his having over 1150 publications, numerous honors, recognitions and accolades - including being honored by Queen Elizabeth II as a Knight-Bachelor for his services to chemistry and molecular nanotechnology – Professor Stoddart said that “a central driving motivation of my life’s work is teaching and

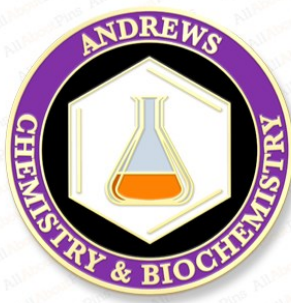


mentoring.” He has mentored over 450 students from over 43 different countries. He also revealed his insatiable search for beauty, evidenced by a lifelong fascination with stereochemistry and topology, and his fondness of poetry.

One of his favorite quotations, apart from the poetry of Scottish poet Robert Burns, comes from Professor of Chemistry Joseph Chatt (1914 - 1994): ‘Scientific discovery is not yet predictable. If you have an exciting road to follow do not be put off by those who say that there is nothing at the end of it; they do not know. Persevere, and enjoy the excitement of exploring the unknown.’

Thank you to Dr. Desmond Murray for inviting Sir Fraser to speak on the Andrews campus!

Pathfinder Honor



On Sunday, August 11, 2019, Andrews hosted the second Pathfinder Day for Pathfinders traveling to the International Pathfinder Camporee in Oshkosh, WI.

Participants chose from activities across campus, all staffed by volunteers. Our department hosted a chemistry activity for 68 Pathfinders and their group leaders. Upon completion, each participant received a certificate redeemable for a commemorative pin and the Pathfinder chemistry patch. The activities were conducted by Andrews students, faculty, staff and volunteers from the community. The program began with a welcome and safety orientation, after which the Pathfinders formed 12 groups each with 5-7 members. Each group spent 10 minutes at each of 12 stations engaging with one aspect of chemistry. Activities included: testing hand prints for nitrogen with ninhydrin; exploring physical properties of several elemental materials; observing color changes with acids or bases using red cabbage juice indicator; building some simple molecules with a molecular model kit; seeing how atoms are made from protons, neutrons, and electrons. The participant responses were very positive and we look forward to another gathering of Pathfinders five years from now.

The Department of Chemistry & Biochemistry is very grateful to all the volunteers, who included alumni from the '60s, '80s, '90s and 2010s. We welcome comments and funds to improve our service for the young people who will be the leaders of our global church tomorrow.



Gamma Sigma Epsilon

On April 26, 2019, the Eta Alpha Chapter in the Gamma Sigma Epsilon chemistry honor society was installed at Andrews by society representative, Greg Boyce, of Florida Gulf Coast University. We inducted thirteen charter members. In addition to our own chemistry faculty, guests included Margarita Mattingly from Physics and Keith Mattingly, Dean of the College of Arts and Sciences. Milk and cookies completed the event.



Nowack Tribute Garden

On May 6, 2017, Ron and Laura Butlin and family dedicated a tribute garden to Dr. Dave Nowack and his wife Judy. They thanked the Nowacks for the "gift of peace and confidence" they received as parents knowing that Dave and Judy were providing support to their children and countless other students as well. They mentioned such kindnesses as: emergency aid, scholastic guidance, summer storage, temporary housing, rides to the airport, etc. The Butlins concluded that the Nowacks are a living witness of God's character.



Quant Lab Coats—The Tradition Continues!



Front: Isabella Tessalee, Dara Atmadja, Colleen Staniszewski, Kaitlyn Steeves,
Kieun Chung, Jasmariee Anderson, Cindy Murillo
Middle: Joshua Pak, Jonise Hammond, Lun Kim, Hannah Castillo, Emma Suvacarov,
Dr. Randall, Dr. Alex Straiker (seminar speaker)
Back: Andrew Hodgins, Jemuel Curameng, Daniel Chi, Grant Sajdak

Congratulations to all the brave new analytical chemists!

ChemClub



Kieun Chung, Social Coordinator;
Cindy Murillo, Religious Coordinator,
Paul Thompson, co-President;
Grant Sajdak, Outreach Coordinator;
Skyler Schell, co-President;
Dinelle Abeysinghe, Media Coordinator

We are proud of the new group of ChemClub leaders. They continue to celebrate Mole Day, offer vespers and other social activities for all departmental majors and friends.

PharmClub



Since its inception in 2015, the Pre-Pharm Club has been housed in our department, and sponsored by Loma Linda School of Pharmacy. Under the leadership of Precious Ndlovu and Cindy Murillo, the club held its fourth community service “Drug Take Back” day, October 25, 2019.

Ms. Ndlovu has also worked out a pharmacist shadowing opportunity with Lakeland-Spectrum Health in St. Joseph, MI. This is an important component of a student’s application to pharmacy school, and we are proud of her perseverance.

2019 Graduates & Awards

2019 Undergraduate Degrees

Jesse Gray, BS Biochemistry

- ◆ Magna Cum Laude
- ◆ JN Andrews Honors Scholar
- ◆ American Chemical Society

Lisa Hayden, BS Biochemistry*

Diana Kerowa, BS Biochemistry

Gergana Milkova, BS Chemistry

- ◆ Cum Laude
- ◆ JN Andrews Honors Scholar
- ◆ American Chemical Society

Josselyn Roosenberg, BS Biochemistry

- ◆ Summa Cum Laude
- ◆ JN Andrews Honors Scholar

Nathaniel Srikureja, BS Biochemistry

- ◆ Summa Cum Laude
- ◆ J N Andrews Honors Scholar
- ◆ American Chemical Society

2019 ACS Class Awards

General Chemistry Award	Emily Jurek
General Chemistry Award	Adam Kim
General Chemistry Award	Shelly Rauser
Analytical Award	Josselyn Roosenberg
Organic Chemistry Award	Brianna Croughan
Organic Chemistry Award	Daniel Chi
Physical Chemistry Award	Nathaniel Srikureja
Biochemistry Award	Brandon Shin
ACS Scholarship	Paul Thompson

Become a Chemistry Partner

Send checks to:

Department of Chemistry and Biochemistry
4270 Administrative Drive, HH225
Andrews University
Berrien Springs, MI 49104

2019 Awards Ceremony



Scholarships 2019-2020 school year

Lois K. Mutch Scholarship	Hannah Castillo
Dwain Ford Scholarship	Paul Thompson
Dwain Ford Scholarship	Daranthea Atmadja
Richard Cook Scholarship	Wonjae Daniel Kang
Thomas Mullin Scholarship	Theo Sumampouw
Ralph Scorpio Scholarship	Nikitha Nelapudi
Theodore Hirsch Scholarship	Vanessa Garcia
Theodore Hirsch Scholarship	Joshua Pak
Mutch, Scorpio, Wilkins	Sara Hebert
Minesinger Scholarship	Daniel Chi
Minesinger Scholarship	Aaron Jacobs
Robert Wilkins Scholarship	Anthony Miller
Robert Wilkins Scholarship	Maya Turon
H. F. Halenz Scholarship	Emma Suvacarov
H. F. Halenz Scholarship	Isabella Tessalee
Max Taylor Scholarship	Alicia Dent
Glen Abbot Scholarship	Adolfo Potts
Hall & Miller Scholarship	shared by **

** Arthur Lee, Jakub Krzywon,
Kristen Proctor, Skyler Schell

The Molecular Sieve is produced annually
by the Department of Chemistry and Biochemistry

Editor—D. Johnston Editor-in-Chief—D. Randall

Reporting by L. Ahlberg, G. Merga, D. Murray,
and D. Nowack

Alumni Notes



Camille Martin (BS, Chem. '14)

This fall, I earned my PhD from Northeastern University for work on *"Sensors, Sunscreens, and Shirts: Design and Characterization of Biomimetic Materials Inspired by Cephalopods."*

I am also founding CEO of Seaspire, a 2017 start-up company that I developed along with Professor Leila Deravi to commercialize my research. Both my academic research and business development are part of my lifelong fascination with cosmetic chemistry and passion for blending fashion and science. My work involving the design of bio-inspired materials for applications in cosmetics has been published in scientific journals and has received significant media attention, including an article in The New York Times, "Squid Share a Colorful Trick with Peacocks."

I participated in the National Science Foundation Innovation Corps program at Northeastern evaluating the potential to commercialize the technologies developed in the Biomaterials Design Group led by Professor Deravi. The sea-inspired technology we developed can be applied to coatings, textiles, cosmetics, electrochromic devices, and sun-care products. In 2018, the group filed two Patent Cooperation Treaty applications. I created Blend, the consumer brand of Seaspire, to focus on reef-safe tinted sunscreens that provide protection against ultraviolet rays without the undesirable white residue characteristic of mineral-based formulations. As a result, I was awarded the IDEA Prototype Grant from Northeastern's Venture Accelerator to develop the first iteration of the product line.

I am scheduled to present my work next February 2020 as part of our department's Dwain L Ford Guest Speaker seminar series. See you there!

Amanda Avellone (BS, Chem. '95)

After graduating from Andrews, I went to Loma Linda for medical school and then to Saint Louis University for residency and fellowship. I finished training in Pulmonary, Critical Care, and Sleep Medicine in 2005, and have practiced in those specialties since, mostly serving rural communities south of St. Louis, MO.

My husband and I got married in 2000 and have a son aged 11 and a daughter aged 8. My hobbies are ever shifting, but currently my main time sinks are knitting and 3D (digital) sculpting, modeling, and procedural texturing.

I have generally only fond memories of my years at Andrews. I received what I needed in terms of education and support, and I felt personally cared for which I can only assume would be much less likely to be true in a larger institution. I will be forever grateful for that.

I recall with a smile, the camaraderie between all of the students and professors. I remember how using spectroscopy to analyze our samples was like solving puzzles or reading a secret language, very rewarding. I think I had a very good record of not breaking any glassware until my last year, when I more than made up for it. The entire forensic chemistry class was a blast! Good times. I loved organic chemistry. I'd encourage anyone to follow the path I took at Andrews, and Loma Linda. Keep up the good work! And thank you!



Beth Cady Burghardt (BS, Chem. '83)

My husband, Frederick Burghardt (BS, Biology '82) are still living in rural Central NY, having built a home just down the field from my parents ten years ago in the hills south of Syracuse.

All three daughters attend Andrews. Katharina (BA Music Education Spring 2020), Annelise (BA Psychology/Music 2021) and Alaina (BA Spanish/Global Studies 2024) are enjoying their one year on campus together before Kathe graduates.

Fred is Education Superintendent for the New York Conference of Seventh-day Adventists and Academic Vice-Principal at Union Springs Academy. I am a solo otolaryngologist practicing general ENT and head and neck surgery in Syracuse. I'm also a claims reviewer and sit on the board and executive committee of MLMIC Insurance Company, a Berkshire Hathaway subsidiary and the largest medical malpractice admitted carrier in New York state.



This year will be my 40th Alumni reunion at Union Springs Academy. Fred and I have greatly enjoyed visiting Andrews regularly to attend Kathe and Annelise's performances with University Singers, Mr. Reid's Voice studio, Singer/Actor

(Continued on page 6)

Alumni Notes

Workshop opera productions, AU Theatre Wing...and on and on!

Our empty nest still holds two miniature Australian Shepherds Frodo and Gimli, and we enjoy spending time with family in the CNY area.

Harvey Elder (BA, Chem. '52)

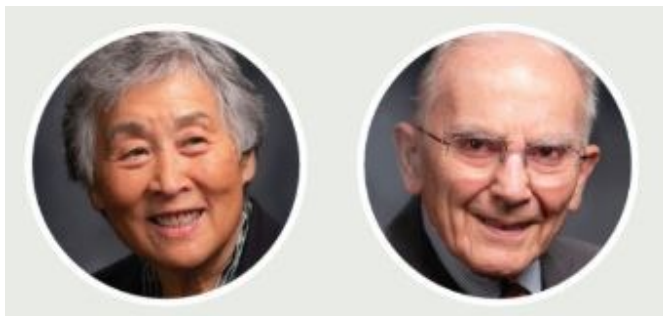
I enjoyed chemistry at EMC, and remember John Christiansen as an encouraging teacher. At Loma Linda medical school, I enjoyed biochemistry so much that I took a year to study metabolism of glutathione in erythrocytes and complete my MS in Biochemistry under Dr. Mortensen at Loma Linda.

I finished an internship in internal medicine at University of California, in San Francisco, in 1960, and was immediately inducted into the military. I was assigned to the NIH, Laboratory of Infectious Diseases and Chemotherapy, where I worked under Dr. Robert Coatney studying malaria at the federal penitentiary in Atlanta, GA. The next five years I trained in infectious diseases at Harvard, and have been teaching at Loma Linda University ever since, though with a lightened load these last five years.

I have frequently taught at other medical centers and at the CDC in Atlanta, GA. I became involved in care of HIV/AIDS patients and teaching how to prevent infection. This disease presents the church a great opportunity to show the character of God.

I married my college sweetheart, Eleanor Pudleiner. She home schooled our two children until our youngest was in school. Then she went to University of California, Riverside and got her MS in Education with an emphasis in teaching reading. She had her own private studio for many years and helped many children become successful readers.

Unfortunately, Alzheimer's disease developed and after more than a decade, took her life. After a while, I began courting Grace Emori, who had been



my first infection control nurse. I knew she loved the Lord, and we got along well. We are now coming up on our third anniversary.

I have become increasingly aware of God's unquenchable love. This has allowed me to ask my patients about spiritual matters. Often, we get into

Alumni Notes

deep areas and patients want to give their hearts to Jesus. Grace joins me in this, praying while I am seeing patients and also bringing lonely people to our home for lunch. Thus, we are able to work together making a difference in lives. Grace and I are also partners in teaching classes regarding spiritual issues.

Charlie Koerting (BS, Chem. '79)

From Andrews I went to the California Institute of Technology, where I earned a PhD in Physical Chemistry. My thesis used variable angle electron spectroscopy to look at gas phase molecules.

I took a job at DuPont, in the polymer products department doing electron microscopy on polymer blend structures. As an analytical consultant and project coordinator, I solved real world issues relating to manufacturing issues. I also worked on a number of regulatory issues with the EPA and FDA. Every day brought a new challenge. The chemistry I learned as an undergraduate was really useful.

After 32 years, DuPont was involved in a mega-merger with Dow and I was made an offer I couldn't refuse. So now I am "retired" but still do some consulting work. I am busier now than when I was working! I am on our local church staff as the worship ministry leader and as the Chesapeake Conference Pathfinder Coordinator.



When I left graduate school I swore I would stay far away from teaching, but I do a lot of leadership training of local church leaders and conference pathfinder leaders. I see the value of good teachers and am forever grateful for the teachers I had at Andrews, especially the WMW triumvirate: Wong, Mutch, Wilkins. I did very well by their training, advice, and examples.

On the personal side I am married to Sierra (whom I met while in graduate school) and have two children (Christel and Peter) who are both nurses and live in Chattanooga, TN.

STEM Boost

Summer 2019, the Andrews STEM departments offered the first of an extensive series of classes that will ultimately lead to a STEM Certificate or a STEM Education Masters. STEM Boost gave in-service teachers tools and knowledge they can immediately use by combining an extensive online learning curriculum with a week-long on-site lab experience. The Chemistry & Biochemistry portion of the class was developed by Dr. Ryan Hayes and linked atmospheric science and intelligent design motifs. Dr. Dave Nowack lead the lab experience. The reaction of the teachers in the lab, and their formal assessments indicate that these experiments were engaging and highly useful.



MASAL Conference

This March, five department majors, including all three of our ACS graduates, attended the annual Michigan Academy of Sciences, Arts, and Letters which was held at Alma College. In this supportive atmosphere, each student gave an oral presentation on research they are pursuing at Andrews. Faculty from colleges and universities around the state were impressed with the quality of student researchers at Andrews. We are grateful for support from the Office of Research and Creative Scholarship to provide transportation for this day-long event.



BCCE 2018

At the end of July 2018, college & university level chemistry & biochemistry teachers from around the nation gathered at Notre Dame University for the Biennial Conference on Chemical Education, which is sponsored by the Chemistry Education Division of the ACS. Drs. Ahlberg, Hayes, Murray, and Randall all made presentations at this 2018 professional meeting. Given Andrews' strong support of chemistry education, we chose to co-sponsor the event.

This five day conference featured over 500 talks in about 40 parallel sessions and a plenary lecture on four days, in addition to getting insights into creative teaching approaches from colleagues. SDA chemical educators have been attending this meeting for decades. In 2012, Dr. Ahlberg (from Andrews), Dr. Kyle Craig (Andrews Alum @ Walla Walla), and Dr. Kent Davis (Andrews Alum @ PUC) met at the BCCE held at Penn State.

In the intervening years this core group has expanded to include colleagues from La Sierra, PUC, Walla Walla, Andrews, Southern, and Southwestern. For the 2018 meeting, at least four academy chemistry teachers joined. It was a great opportunity to network with fellow Adventist chemical educators. The group enjoyed a dinner together at the Ahlberg-Randall house. We look forward to meeting with more alumni and friends at the 2020 BCCE meeting in Oregon.



Dear Alumni

As new chair I'd thank Dr. David Nowack, the chair for the last 10 years. He initiated several improvements during his tenure, including a major renovation to the teaching labs, the stockrooms, the instrumentation suite, the lecture hall, and the reading room. Dave and his wife Judy have a gift for nurturing students as evidenced in the touching tribute a few pages back. Thank you Dr. Nowack for everything you have done.



A thank you is also due the chair who preceded Dr. Nowack. Dr. Mutch continues to serve our department by spending several days repairing broken glassware each alumni weekend. I'm sure you remember fondly other professors. Through the enduring commitment to excellence by the faculty, our department serves those around us, including the Adventist church at large. A recent review shows that 40% of the chemistry faculty at other SDA colleges are graduates of our department.

Students with inspirational talent continue to join us. Our department still provides a nurturing environment to support them. A pressing need to maintain this environment is updating our 19 year old NMR. For several years, we have experienced tool-downs, some lasting weeks. New parts are not available, since the model has been retired for years. JEOL has generously provided salvaged parts, but that is not a long-term sustainable solution.

The university is planning for the major expense of a new NMR. But as always, funds are limited. About 20 years ago, departmental alumni and friends generously provided support for our current NMR. As we seek a new 400 MHz NMR, we humbly ask for your support again. Our fund raising goal from alumni is \$20,000 in pledges. As noted above, the rest of our instrument fleet is modern. We believe in this. All of our faculty have pledged for a total of \$3,000. Our new student honor society is selling their homemade sugar scrub to help.

We know that this is an "ask" that may be beyond the means of some of our treasured alumni. Whether you are able to pledge or not, we ask your prayers on behalf of our students, department, and university.

David Randall

Forensic Lab Report

The Berrien County Forensic Lab (BCFL) continues in its 47th year, to serve local law enforcement units with narcotics analysis and court testimony as regarding drug interdictions. The impact of the new legal status of marijuana in Michigan has yet to be determined.

John Rorabeck, Lab Analyst, reports that while crystal methamphetamine use and the opioid crisis remain top concerns, the year 2019 has been different from any other, because Michigan voters approved the recreational use of marijuana resulting in a decreased submission of plant material and edible forms of THC. There are, however, an increasing number of cases requesting analysis of cannabidiol (CBD), a non-psychoactive component of marijuana that has received FDA approval. The improved sensitivity of our LECO Time-of-Flight mass spectrometer is proving valuable in determining the presence of these compounds at low concentrations.



Unfortunately, there has been an increase in submissions of vaping devices brought in by School Resource Officers. We are glad to be able to provide rapid and accurate analysis of these items.

The Michigan Department of Health and Human Services has now confirmed a dozen cases of severe lung disease associated with vaping and is investigating another 14 possible cases. Nationwide there have been 530 people diagnosed with vaping-related illnesses and eight deaths. An emergency ban against flavored vaping liquids has been issued in Michigan, and it is hoped this will discourage children from beginning the habit.



E-mail alumni updates and pictures to David Randall at chemistry@andrews.edu

Good-bye 2019 Graduates



Pictured above from left to right: ***Gergana Milkova*** is looking for work in the Chicago area and considering graduate school; ***Josselyn Roosenberg*** is studying medicine at Loma Linda University; ***Diana Kerowa*** is working at Great Lakes Scientific, so we still get to see her from time to time. ***Lisa Hayden*** is home in Evanston making plans for the future; ***Nathaniel Srikureja*** is at Loma Linda School of Medicine; ***Jesse Gray*** is a graduate student at Columbia University in New York studying organic chemistry.

Happy Holidays

From your Department of Chemistry & Biochemistry



Like us on Facebook!



Andrews University
Department of Chemistry & Biochemistry
4270 Administration Dr
Berrien Springs, MI 49104-0430
Address Service Requested