

# MOLECULAR SIEVE

## Andrews University

Department of Chemistry & Biochemistry

An American Chemical Society Approved Program since 1976

Fall 2016

### Lake Union Conference Camporee "All In" with Chemistry Demos

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#### 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



Photo by Jonathan Logan

Using hydrogen peroxide, soap and KI catalyst, Ryan Hayes demonstrates that God can do great things when we go "all in."

Every five years the Lake Union sponsors a Pathfinder Camporee, bringing Pathfinders from Illinois, Indiana, Michigan and Wisconsin to the Berrien County Youth Fairgrounds just across the street from Andrews University.

This year Andrews University made an intentional effort to be involved across campus. The Department of Chemistry & Biochemistry offered 100 Pathfinders (and their adult sponsors) an opportunity to earn the chemistry honor. Dr. Hayes, and ChemClub president, Dillon Zimmerman, put together a set of activities to teach some of the basic tenets of chemistry. Over twenty university student volunteers were available at ten stations duplicated

on two floors. At each station, Pathfinders explored different areas of chemistry including molecular structure, metals, conductivity, acid-base chemistry with cabbage juice, and gas chemistry.

Pathfinders who completed the course will receive a beautifully crafted chemistry pin at investiture next spring. The university student volunteers were also excited to earn pins for their effort.

Each night of the camporee, Ryan Hayes and a group of dedicated chemistry majors presented a chemistry demonstration to illustrate a spiritual truth for the 2100 Pathfinders and adult sponsors in attendance.

## Enrollment Up!

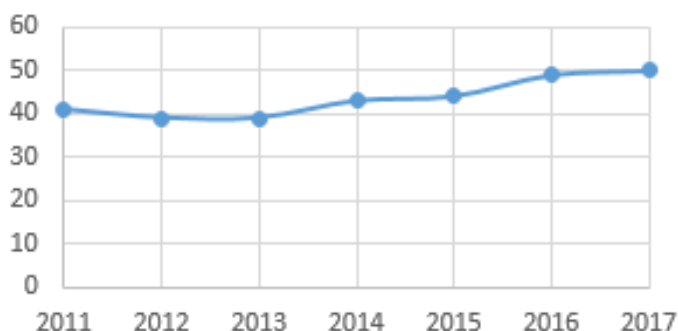
Over the last six years the number of majors in the Department of Chemistry & Biochemistry has increased by 25%.

The fifty majors, as of October 1, 2016, are comprised of: one Biotechnology major- Chemistry emphasis, three ACS Chemistry majors, four Chemistry majors, seven ACS Biochemistry majors and 42 Biochemistry majors. There are 23 women and 27 men.

The increase can be attributed to effective recruiting and advising by the faculty and by excellent retention of majors. The number of majors transferring to other departments has slowed in recent years helping support the increase.

We continue to provide the best chemistry education in Adventist higher education. If you know of a young person who would benefit from a great education, comprehensive research opportunities and strong spiritual mentorship, please have them contact us. They, and you, will not be disappointed.

Majors



## Food Chemistry Workshop

During the summer of 2016, Lisa Ahlberg was accepted into the NSF funded cCWCS (Chemistry Collaborations, Workshops and Community of Scholars) Food Chemistry Workshop at Clarke University in Dubuque, IA. During this fantastic opportunity the participants tested food chemistry lab experiments in the university kitchen and got ideas about how to develop classes ranging from non-majors courses to upper division majors courses and even honors interdisciplinary courses all involving food chemistry. She looks forward to a time when her schedule will allow her to teach one of these new courses.

## Research Collaboration

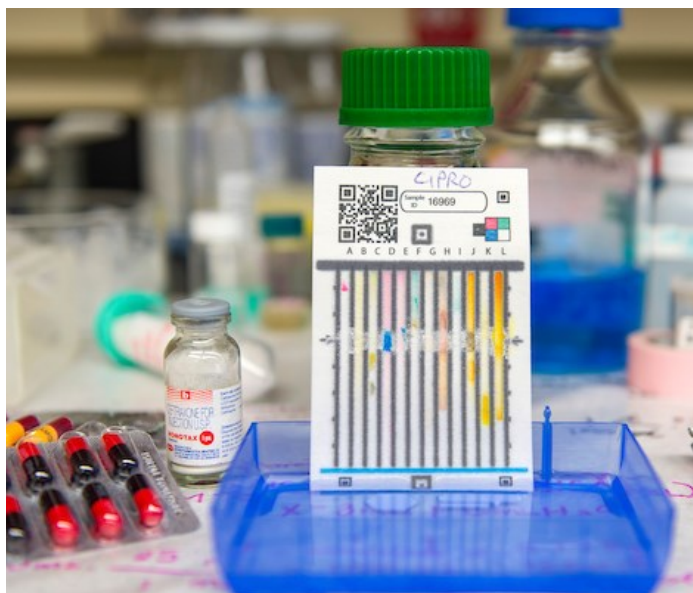
Dr. Murray, continues his tradition of inviting top-notch speakers to share their work with us in the chemistry seminar program. This year Dr. Marya Lieberman, of Notre Dame brought a presentation on finding falsified medicine in the developing world.

Following her talk, Dr. Lieberman has joined our Dr. Merga and the director of Berrien County Forensic Lab, John Rorabeck in collaborative research on a project with international appeal. Two of our department majors, Tammy Leong and Noah Chun are also involved in the collaboration.

Dr. Lieberman is a surface and analytical chemist who became interested in the failure of existing technologies to meet the analytical needs of developing countries. Her research into paper analytical devices assists people in developing countries to detect fake medicine, monitor environmental challenges and alleviate shortage of micronutrients.

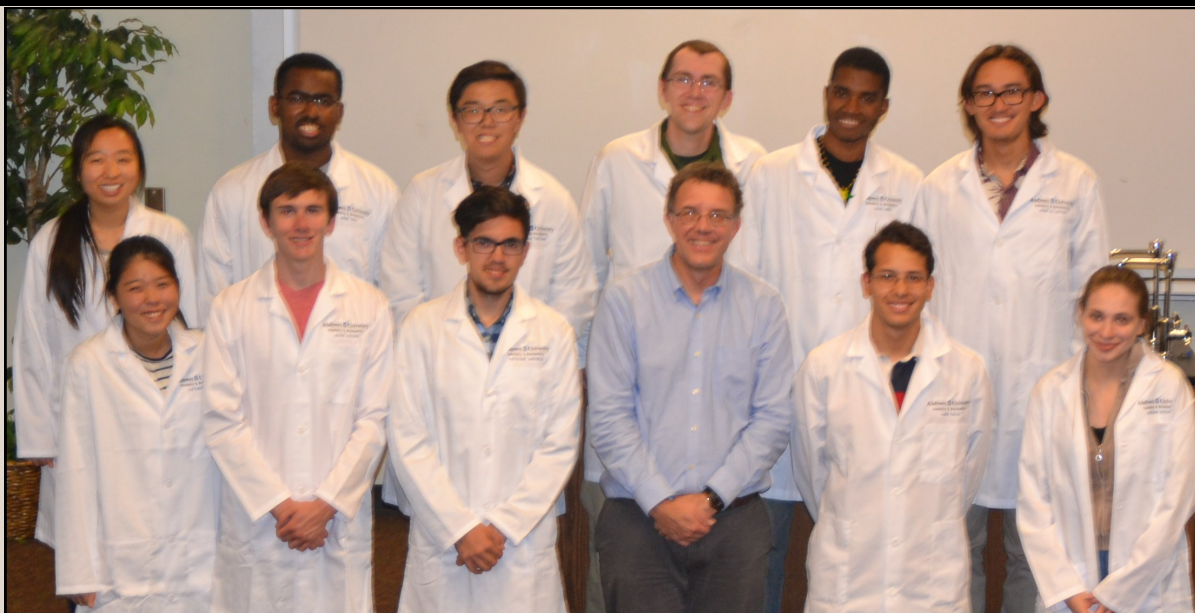
The combined research team is expanding the study to include illicit drugs and their common adulterants. By implementing a multi-channel paper card capable of detecting a variety of functional groups and smart-phone based applications for recognizing color patterns unique to specific drugs, this work hopes to enable minimally trained personnel to interdict contraband substances without the need for laboratory equipment.

The study is supported by funding through the Grand Challenges Explorations grant which was awarded to Dr. Lieberman by the Bill and Melinda Gates Foundation in 2014.





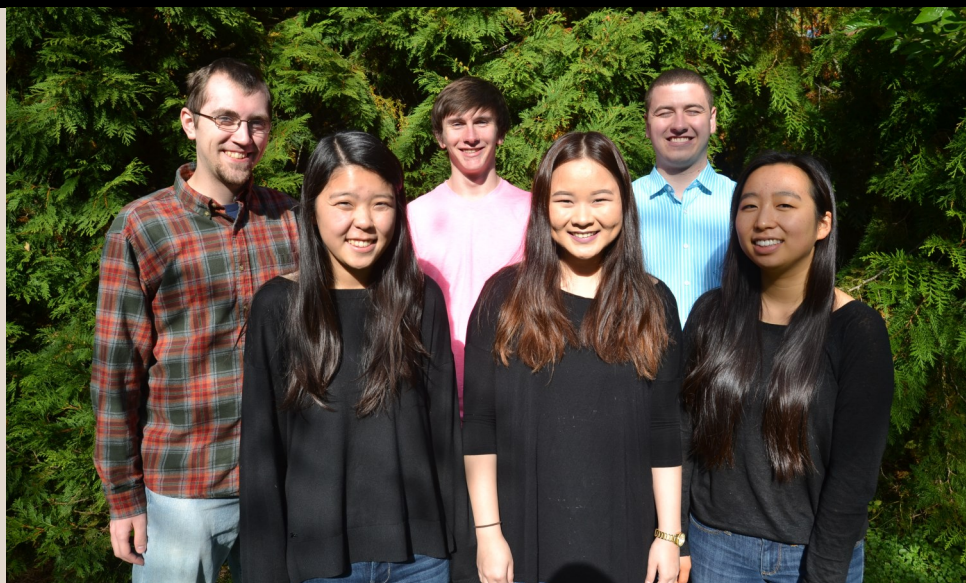
## Quant Lab Coats



Back: Danielle Oh, Jesse Gray, Dongwan (Tom) Kang, Dillon Zimmerman, Cleve Hines, Donn Latour  
Front: Victoria Kim, Jacob Jackson, Nathaniel Srikureja, Dr. Randall, Obed Gall, Gergana Milkova

We continue the tradition of awarding lab coats to our majors who take **Quantitative Analysis**. Each coat is embroidered with the name of the courageous student unafraid to tackle some serious chemistry.

## ChemClub Officers



Back Row: Dillon Zimmerman, President; Jacob Jackson, Secretary; Gabe Butlin, Outreach Coordinator  
Front Row: Victoria Kim, Social Vice-President; Tammy Leong, Media Coordinator;  
Danielle Oh, Religious Vice-President

## BCCE 2016

This summer Ryan Hayes, David Randall, and Lisa Ahlberg attended the Biennial Conference of Chemical Education in Greeley, Colorado. Between 500 and 1000 educators gathered for the BCCE, which is an excellent opportunity to network with colleagues and get ideas for improving the way we teach. Andrews attendees met with other Adventist educators from Southern Adventist University, La Sierra University, Pacific Union College, Walla Walla University, Union College and Southwestern Adventist University; we enjoyed discussing chemistry classes and our different approaches at our specific schools.

The meeting was also a fantastic learning experience where Dr. Ahlberg found ideas on how to implement competencies into the organic curriculum. Other topics discussed included: classroom flipping, lab and research integration into lecture courses, and capstone experiences. Dr. Ahlberg also presented a research project on incorporation of research and laboratory experiences in organic chemistry instruction.

Dr. Hayes presented a paper on the new capstone general chemistry lab he has developed showing dendrimers as transport vehicles between aqueous and organic phases. Our business, Andrews ChemServices now offers dendrimer lab kits which can be purchased by other educational institutions for the purpose of facilitating the same capstone lab experience for their students as well. Our colleagues at Pacific Union College are committed to running this lab with their general chemistry class—and reporting the results to us.

Dr. Randall attended sessions about general chemistry, analytical chemistry, and developing professionalism in chemistry students. The sessions on professionalism suggested specific tasks to give students practice in the important areas of their life. In the general chemistry sessions, it was reported that many colleges and universities are finding that students learn chemistry better with more instruction and practice than is possible with only three lectures and one lab per week. As you probably remember, Andrews has structured its general chemistry course to meet five days a week.

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

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

## 2016 Graduates & Awards

### 2016 Undergraduate Degrees Awarded

Emily-Jean Bankes, BS Chemistry & BS Mathematics

♦ Cum Laude, J N Andrews Honors Scholar

Seth Campbell, BS Biochemistry

Monica Hamilton, BS Biochemistry

Tokin Kim, BS Biochemistry

Ji Yeon Lee, BS Biochemistry

Adrianne Magsipoc, BS Biochemistry

♦ Cum Laude, J N Andrews Honors Scholar

Joanna Moses, BS Biochemistry

Iris Peter, BS Biochemistry

Naude Pierre, BS Biochemistry

### 2016 Class Awards

ACS General Chemistry Award

Nathaniel Srikureja

ACS General Chemistry Award

Michael Lee

ACS General Chemistry Award

Zachariah Swerdlow

ACS Organic Chemistry Award

Donn Latour

ACS Analytical Chemistry Award

Adriana Delgado

ACS Analytical Chemistry Award

Tokin Kim

ACS Biochemistry Award

Hyelin You

### 2016 Scholarships

Lois K. Mutch Scholarship

Hyelin You

Tait Family Scholarship

Dillon Zimmerman

Dwain Ford Scholarship

Kaydra Bailey

Halenz Scholarship

Donn Latour

Richard Cook Scholarship

Jason Grellmann

Ralph Scorpio Scholarship

James Butlin

Mutch, Scorpio, Wilkins Award

Noah Chun

Richard Minesinger Scholarship

Lauren Bitterman

Robert Wilkins Scholarship

Adriana Delgado

Theodore Hirsch Scholarship

Abraham Lee

Donald Snyder Scholarship

Jesse Gray

Thomas Mullin Scholarship

Jacob Jackson

Taylor & Abbott Scholarships

Victoria Kim

Hall-Miller Scholarship

shared by\*\*

\*\*Danielle Oh and Gergana Milkova

### Become a Chemistry Partner

Send checks to:

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

# Faculty Research Report

## Desmond Murray

This is the second school year in the realignment and collaboration between the Berrien County RESA Math Science Center (BCMSC) Grade 12 biology and chemistry courses taught by Dr. Murray and Dr. Denise Smith, respectively. Previously, biology was taught in the fall and chemistry in the spring. The course sequence was reversed to facilitate a seamless full year immersion in interdisciplinary research by BCMSC seniors. In the fall, students are occupied in organic synthesis and analysis, while in the spring, they engage in biological testing using the chemicals they created.

There are five specific research themes that students can choose from: agglutinators, hybrid drugs, hybrid pesticides, liquid crystalline biological stains, and sensors. During the biology research phase students are involved in investigations that include anti-cancer, antibacterial, insecticidal, blood and cell agglutination.

In this chemistry first-biology next sequence students are active in all aspects of scientific research from project selection, literature searching, training in lab safety and waste management, to experimentation using chemical and biological techniques and instrumentation, documentation, data analysis, and dissemination. This capstone research experience requires students to prepare:

- i. a technical final report,
- ii. a popular-science style article,
- iii. a research poster,
- iv. a two-minute research video, and
- v. an oral presentation at the Michigan High School Research Symposium.

The videos have been uploaded to YouTube (see the BEST Early Research Playlist).

## David Randall

During the 2015-16 school year, Dr. Randall mentored Emily Bankes' Honor's research project in investigating the feasibility of using cobalt(II) tetraphenylporphyrinate (CoTPP) as a chemical sensor to detect nitric oxide (NO) in solutions.

Ms. Bankes, a chemistry & mathematics double major, developed a method to analyze UV-Vis spectra that were part of a spectrophotometric titration of NO-saturated solutions into CoTPP. By analyzing data that she and I collected at University of Michigan and applying the method she developed, she calculated the concentration of NO that dissolves in dichloromethane under an atmosphere of gaseous NO.

## Ryan Hayes

Charcoal is made from carbonaceous material, usually coconut husk, that is burned at very high temperatures. Carbon is all that is left. Charcoal is non-polar and passes through your system. It's harmless, and in fact is used to relieve gas or toxins.

Charred food is another matter. Carcinogenic heterocyclic amines (HCAs) are formed when creatine reacts with amino acids in burned meat.

Plants don't have creatine, but they do have arginine, which is similar. It had been shown that arginine might react with plant amino acids in the same way that creatine does with meat amino acids when burned. But no one had looked at the chemical structure of the potentially carcinogenic molecules thus formed.

Dr. Hayes's research group, which has included a half dozen students over the years, took up the question—and has discovered that charred vegetable meat contains new compounds, arginine-based heterocyclic amines. Our newly acquired prep-HPLC has been put to good use to separate out the molecules and the NMR and the GC-MS have allowed the molecular structures to be analyzed.

Robert Zdor, professor of biology, has run one of the new compounds through Ames testing to determine that it is as mutagenic as the HCAs formed in meat with creatine. So it may be no safer to burn your veggie-dog than it is to burn meat. (read the full story in *Focus*, 2016, Summer)

## Getahun Merga

In April, Dr. Merga attended the Global Nanotechnology Congress and Exp on Dubai, U.A.E., where he presented a poster on synthesis and characterization of aqueous only medium gold nanoparticles using hydrogen gas as a reducing agent. He has developed simple, environmentally benign medium, efficient synthesis of gold nanoparticles upon reduction of gold oxide by molecular hydrogen. The size of the particles is controlled by varying the temperature and the atmospheric pressure of hydrogen gas. Suspensions were analyzed for particle size, residual ion and metal-atom concentrations.

Dr. Merga has included several students in his research of the redox catalytic activities of these molecules, monitoring the production of hydrogen gas from water by employing strongly reducing radicals. Surface enhanced Raman scattering spectra of p-aminothiophenol adsorbed on the gold particles surface was also determined.



# Alumni News

## **Earl Peters (BA, Chem. '49)**

I earned my MD from Loma Linda when it was still called College of Medical Evangelists. My internship was at Madison General Hospital in Wisconsin where I spent 23 years in family practice followed by 13 years as an ER physician in Green Bay. I've had difficulty hearing and finding that hearing aids and stethoscopes seem incompatible decided it was time to retire from medicine.

I am now 91 years old and have served in many capacities in the SDA church and am just now retiring from the prison ministry outreach which we started in 1996. The sad news is that my wife, Betty died this year on August 15.

I am blessed to have a son, Gary, who lives two blocks away, and a daughter, Jill, who has moved in with me to help with food preparation and to alleviate my loneliness now that Betty is gone. God is good, and I'm thankful to him.

## **Raymond Mayor (BA, Chem. '51)**

Raymond sent us his life sketch last year—in which he reported that in 2003, his wife Wilma had died after a battle with cancer which began in 1992. This year he has a lovely update to add below. . .

Aileen Weaver Saunders and I started our freshman year at Adelphian Academy together in 1943. Over the years, we have kept in touch and have both suffered the loss of a spouse.

After years of living alone, we decided to get married this March 26! God has helped me sell my house in Berrien Springs, so I have moved to College Place, WA, to make a home with my new bride. We'd love to hear from you. You can get our address from the chemistry department.



## **Donald Caster (BA, Chem. '54)**

I was born in Oswego, NY in 1932 to Galen and Aletha Caster. My dad and his father were well drillers. My mother taught grade school in Florida until she married.

My dad built our house during the late 1940s. My brother, sister and I attended a one-room school house where the walk to school started our exercise for the day. The winters were long and cold.

I attended Union Springs Academy overlooking the beautiful Cayuga Lake. Both of my parents had also attended the academy, and my maternal

grandmother lived there at the time. I found that my most interesting classes were in the sciences—particularly chemistry, electronics and physics.

Our academy class was encouraged to attend Atlantic Union College in Massachusetts, but my Uncle E. E. Cossentine, suggested that EMC would better serve my interest in chemistry.

A chemistry major and physics left little time for outside activities. In my junior year, Dr. John Christensen offered me the job of keeping the laboratory reagents filled. I also worked as a lab TA for the general chemistry class setting up lab equipment and in the physics lab building electrical test equipment.

In September 1955 I married Ilene, daughter of Dr. Otto and Mrs. Dorothy Christensen. Ilene had entered the nursing program at Loma Linda in August 1954, and after two years of military service in the U.S. Army White Coat program, I also went to Loma Linda, joining the 4th dental class of the Loma Linda School of Dentistry.

Upon graduation, I returned to my home town of Oswego, NY, where I practiced dentistry for 33 years. We welcomed a family of four children and 3 grandsons. They have brought great joy and happiness. Our oldest grandson is a freshman at PUC. He plays piano, French horn and cello.

Ilene fell ill and passed away in June 2004 after hepatitis C induced cancer. After four years as a widower, I had the good fortune of meeting DuAnn Kinzer, a widow of 3 years who had lost her husband to prostate cancer. We married and have been blessed with 8 very happy years together. We are both grateful for our Christian education.

## **Lance Hodges (BA, Chem. '57)**

My wife and I are moving back to California as soon as I sell my house Walla Walla. I've been retired for several years and am trying to read some of my big load of books, listen to music and travel—usually with our cat.

## **Donald Halenz (BA, Chem. '57)**

I completed my graduate education at Virginia Polytechnic Institute with a PhD in biochemistry and nutrition awarded in 1961. With my new wife Geralyn (née Spalding) and our daughter, Denise, we headed back to Michigan where I taught at Andrews for 5 years before serving as a professor at Philippine Union College.

The next 13 years were spent in the Far Eastern Division where I worked at Mountain View College in Philippines, first as a professor of chemistry, then

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academic dean, then president. Work permit issues prevented me from serving in Indonesia. Instead I went to Singapore as principal of Far Eastern Academy—their 3rd principal in one year—it was the toughest job I've ever had. Following that, I became president of Southeast Asia Union College.

We returned to the U.S.A. in 1979. I completed a postdoc at UC Davis before teaching chemistry at Pacific Union College until 1999. I continued at PUC as associate academic dean for the next 5 years, the last four years at part time.

Since retirement we have traveled to Europe, South America, Africa and Asia. My wife and I also served as regional directors for Gospel Outreach in South India and Sri Lanka for approximately 5 years, making annual trips there. We are in good health and enjoy our three children and 8 grandchildren.

I appreciate the good start I received at Andrews from my father and others who contributed to my education. I recall taking biochemistry from Mr. James Blankenship. I praise the Lord for his blessings in my life and wish you every success.

## **Kris Gray (BS, Biochem. '81)**

According to the Daytona Beach News-Journal, Kris Gray is the new CMO of Florida Hospital Memorial Medical Center. He will oversee activities and functions related to physicians and patient care, including medical staff services, credentialing, compliance with accrediting bodies, patient satisfaction and infection control.

Prior to his tenure at FHMC, Dr. Gray served as CMO of Florida Hospital DeLand. He completed his medical training at Loma Linda and his residency at Hinsdale Hospital in Illinois.



## **Scott Gardner (BS, Chem. '81)**

I attended Loma Linda, where I married Rebecca (Bekki née Olson) during spring break of my first year. In 1985 we moved to Tillamook, OR, where I practiced for 16 years and we raised our family. We followed our two children to the Lewis Clark Valley along the Snake River just south of Spokane, WA, when they chose to attend Upper Columbia Academy. I practiced in Lewiston, ID, for another 7 years before retiring and taking up my second career as a missionary surgeon.

In 2012, God called us to West Africa, so I resigned from my medical group, we sold our house

and moved to Tchad. I ran the Moundou Adventist Surgical Center there for 27 months before we moved to our current post at Waterloo Hospital in Sierra Leone.

People with faith and courage continued to serve here even after the hospital became an Ebola Treatment Center despite the knowledge that three of their colleagues had contracted the disease and two of them had died.



The most amazing thing about this experience is being in a place where God is central to everything. We pray without ceasing—and it is not just rote routine prayers we often pray in America. God heals people who shouldn't recover. Our diagnostic and treatment options are so limited and primitive, but we do our best and God makes the difference.

<https://gardners2koza.wordpress.com>

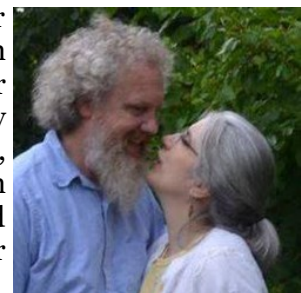
## **Dana Johnston (BS, Chem. '83)**



*Then:* Jeffrey graduated from Andrews in '83 with a BS in math, and became a "fellow of the society of actuaries," while I was pursuing a masters in chemistry at the University of Chicago (MS 86).

*Now:* Jeffrey hung up his actuarial "hat" some years ago and has devoted his time to real estate management and development. After years teaching home-school, I am back at Andrews (personas: administrative assistant, budget balancer, inventory manager, stockroom purchasing agent, dendrimer sales rep, and "hot chocolate lady"). It is good to be in the thick of chemistry and biochemistry activities. I've used my one-free-class-per-semester to complete a BS degree in math and am currently working on a BS in physics.

God has blessed us with five children: Sereres finishing her PhD in physics from University of Massachusetts, Sinclair teaching math at Jackson High in Miami, Sarah in her third year studying forestry at University of Kentucky, Helen a math education major here at Andrews, and Lisa completing her junior year at Andrews Academy.



# Alumni News

(Continued from page 7)

## David Son (BS, Chem. '89)

Now in his 21st year on the faculty at Southern Methodist University, David teaches general and organic chemistry. His current research interests include the synthetic applications of click chemistry, and the synthesis of organometallic polymers for drug delivery and high temperature applications.

In addition to his normal responsibilities as a professor, David now lives on the SMU campus as a Faculty-in-Residence. Since 2014, David and his family have lived in a dormitory with approximately 170 students. They enjoy it immensely! A recent summary of this part of their lives can be found at:

[smu.edu/news/2016/fathers-day-16june2016](http://smu.edu/news/2016/fathers-day-16june2016)



## Michael Orlich (BS, Biochem. '97)

According to the North American Division of SDA, co-investigator Michael Orlich anticipates publication in 2016 of the following topics from the Adventist Health Study 2:

- Colorectal cancer—
  - Calcium and dairy consumption
  - Eating specific meats
- Prostate cancer—
  - Calcium and dairy consumption
  - Tomato consumption
- Breast cancer—
  - Soy consumption
- Weight gain—
  - Meal timing

Last year, Orlich and colleagues reported in *JAMA Internal Medicine* and *American Journal of Clinical Nutrition* that vegetarians have 22% fewer instances of colorectal cancer and 35% fewer instances of prostate cancer than non-vegetarians. The study is based on data gathered from 96,000 members of the SDA church.

## Lief Sorensen (BS, Biochem. '00)

My wife, Heidi (née Aasheim) and I have three children, a daughter and two sons. We both attended Loma Linda Medical School followed by residency stints in Colorado. Heidi is a pediatric anesthesiologist and I am an interventional pain management specialist. My practice is Dimensions Pain Management with Avista Adventist Hospital in

Louisville, CO and Heidi works at Kaiser Health Systems in Denver. We are members of the Campion Academy church in Loveland.

I remember the excellent faculty at the Andrews Chemistry Department and still appreciate to this day the individual attention and care they showed to me. I recall Dr. Wilkins calling me into his office on numerous occasions just to make sure everything was going ok and also to offer to pray with me. I don't think I ever told him in person, but I have always really appreciated him doing that for me.

I remember playing basketball in the early morning on a few occasions with Dr. Alonso. I also remember his incredible patience with me and all of my questions after Organic class each day. Additionally I recall him allowing me to putt on his putting green in his office during long O Chem labs.

I recall Dr. Nowack spending extensive time working personally with me on my senior research project and also offering to pray with me in his office on numerous occasions.

My memories of the Andrews chemistry department are positive and I really appreciate the care and attention you all showed me during my time there. Thank you.



## Chantelle Morris (BS, Biochem. '05)

After working overseas for years, I came back to upgrade my skills in clinical research, and now I'm finally settled in a new career. I work for a hospital health system in Toronto as a medical education, research and bioethics associate. It incorporates my overseas job in academic coordination with research but allows me to work in my passion of putting patient well being and safety first.

God has continued to bless me in many ways. I attend Kanisa Fellowship SDA church in Toronto, where I'm involved with music, Sabbath School and outreach ministries which aid the physical and spiritual nourishment of the homeless communities downtown.

The Andrews biochemistry and chemistry department prepared me not only to expand explore the world of science but to also share the word of God with others. Continue to inspire greatness in students as you have done for me and many others!

## Evan Butlin (BS, Biochem. '08)

I had an adventure that made military history,



# Alumni News

transporting a patient from the ICU at San Diego Naval Medical Center to the specialized Air Force hospital in San Antonio.

The San Diego loading crew was 40 members strong. Even though we use a c-130 configuration cargo plane, there is never enough room—with an 11 member medical flight team and an air crew of 7.

After a 3 hour flight and a combat landing in Texas, we had to repeat the whole process in reverse with a 45 member ground medical crew assisting till we turned the patient over to the ICU trauma team later that morning.

The transport was ordered on Thursday evening and had him in the ICU at San Antonio by 4:30 a.m. Saturday morning. This was not a comfortable trip—it may take days to get my voice back from the screaming. Happily, the patient is doing well.



## Swanieka Choy (BS, Biochem. '15)

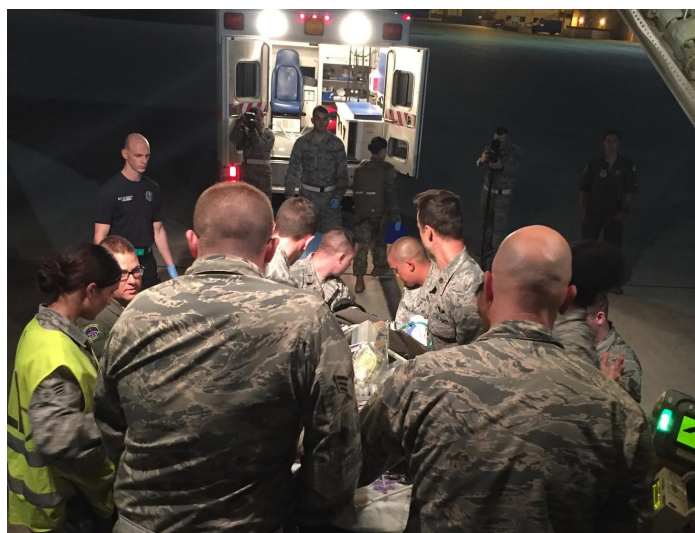
Graduate school at Case Western is going great for me. I spent the summer as a TA for the first year Physician Assistant students' gross anatomy class (all those years working for you as a TA definitely paid off). I will be taking my MCAT sometime early next year and am scheduled to take my comps and finish up my masters degree by July 2017.

I plan to work here at the Case University Hospital during my gap year and start medical school in the fall of 2018.

## Jordan Holzschuher (BS, Biochem. '15)

I am working at JBN Medical in Burlington, Ontario, as a research coordinator. We manage patients, meet with patients and do lots of computer work. In fact, I've also been working with RankHigher, a search engine optimization marketing company. I write medical content for the websites they create.

I've decided to take my passion further into the chemistry field by applying to University of Western Ontario's graduate school in Chemical & Biochemical Engineering.



## Brittany Adele (BS, Biochem. '13)

Dr. Nowack ran into Brittany at graduation this spring and learned that she was entering nurse anesthetist school this fall.

## Camille Martin (BS, Chem. '14)

Another alumna Dr. Nowack met at graduation this spring. She is continuing her PhD at Northeastern University where she was taking a class from John Engen, who was a former student of Dr. Nowack's at Union College. He is the foremost authority in the mass spectrometry of biological materials such as proteins. Camille said Dr. Engen was her favorite teacher. Small world.

## New PharmClub

This year three students requested that a pre-pharmacy club be established here at Andrews. As the pre-pharmacy advisor, Dr. Nowack noted, "Joanna Lee, the president, Jon Mamahit, the secretary/treasurer, and Yewon Kim, the vice-president/pastor are among three of the most energetic and imaginative club officers that I've had the privilege to mentor."

The new PharmClub is financially sponsored by the Loma Linda University School of Pharmacy and that support allowed the club to run its first annual *Drug Take Back Day*. Working with the Berrien Springs-Oronoko Township Police Department,



University Medical Specialties and the Berrien County Forensic Laboratory, students collected over 5 pounds of unused or out-of-date prescription medications from the public. This event and others planned, make this first year of the club's existence already a highly successful one.



## Message from the Chair

After a remarkable fifteen years of continuous operation, in September, 2016, the magnetic field of the 400 MHz Jeol NMR quenched. The exact time and cause or causes of the quench are not fully known. The recommissioning of the magnetic field is estimated to cost \$41,000 plus the cost of the cryogenics for a total of \$51,000. We are currently negotiating the scheduling of the recommissioning with the administration. The timing of this catastrophic event has created an opportunity to begin a discussion with the administration about an upgrade in the electronic console of the NMR.

The entire instrument is about 15 years old, having been installed in 2001. Jeol has been generous with its repair parts for the console. For example, they gave us one entire circuit board for free because they pulled it from a returned unit that was just sitting around. That gift saved us \$2,000. Nevertheless, parts for our current console are getting increasingly difficult to obtain. The instrument is near its "end of life"...with repairs being impossible.

The University administration is aware of the impending issue with the console and has authorized the Department to seek funding from the National Science Foundation to replace it. The Administration will begin planning for the console's replacement whether or not the grant proposal is successful and funded. Additionally, a key partner in the \$250,000 console upgrade/replacement will be our Chemistry and Biochemistry alumni.

Please pray for our Department and its students, faculty and staff. And as you look forward to 2017, please consider, in your annual donation list, to include the Department of Chemistry and Biochemistry in your plans.

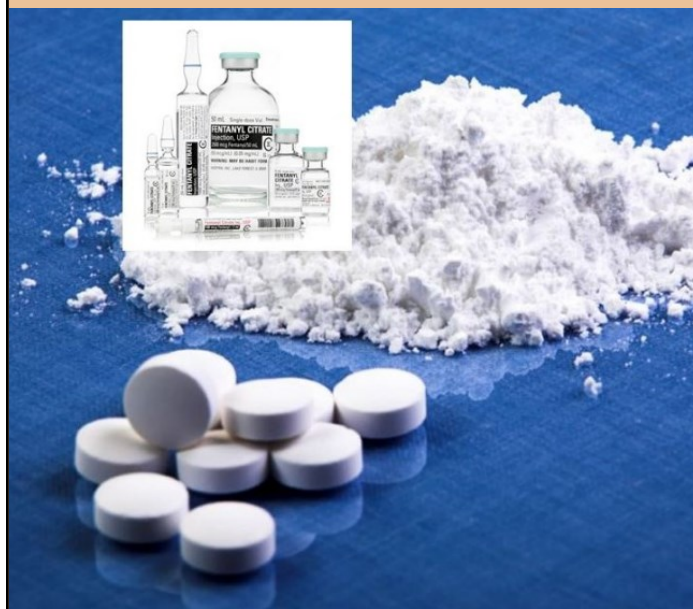
*David Nowack*

## Forensic Lab Report

The buzz word in forensic narcotic testing this past year has been "fentanyl." Communities throughout the country have seen a tremendous rise in overdoses of this synthetic opioid analgesic that is similar to morphine, but is 50 to 100 times more potent. The Berrien County Forensic Lab has seen the incidence of fentanyl submissions go from 2 in 2014 to 9 in 2015 and quadruple again in the first 6 months of 2016, standing at 47 at time of this publication.

But reporting the incidence of these drugs is only part of the service we provide the community. First responders, many of whom now carry naloxone treatment to counter the respiratory depression of narcotic opioids, are being advised to refrain from field-testing the powders they encounter at the scene. Fentanyl and its derivatives are dangerous in even the small amounts that might absorb through the skin or inspired air. Many police departments are finding that the quick, reliable analysis provided in the safe environment of our local laboratory is a vital part of their response to an unwelcome chemical intrusion on their communities. This gives us one more reason to be grateful for the support you provided in the recent ventilation upgrades to your AU Chemistry/Biochemistry Department.

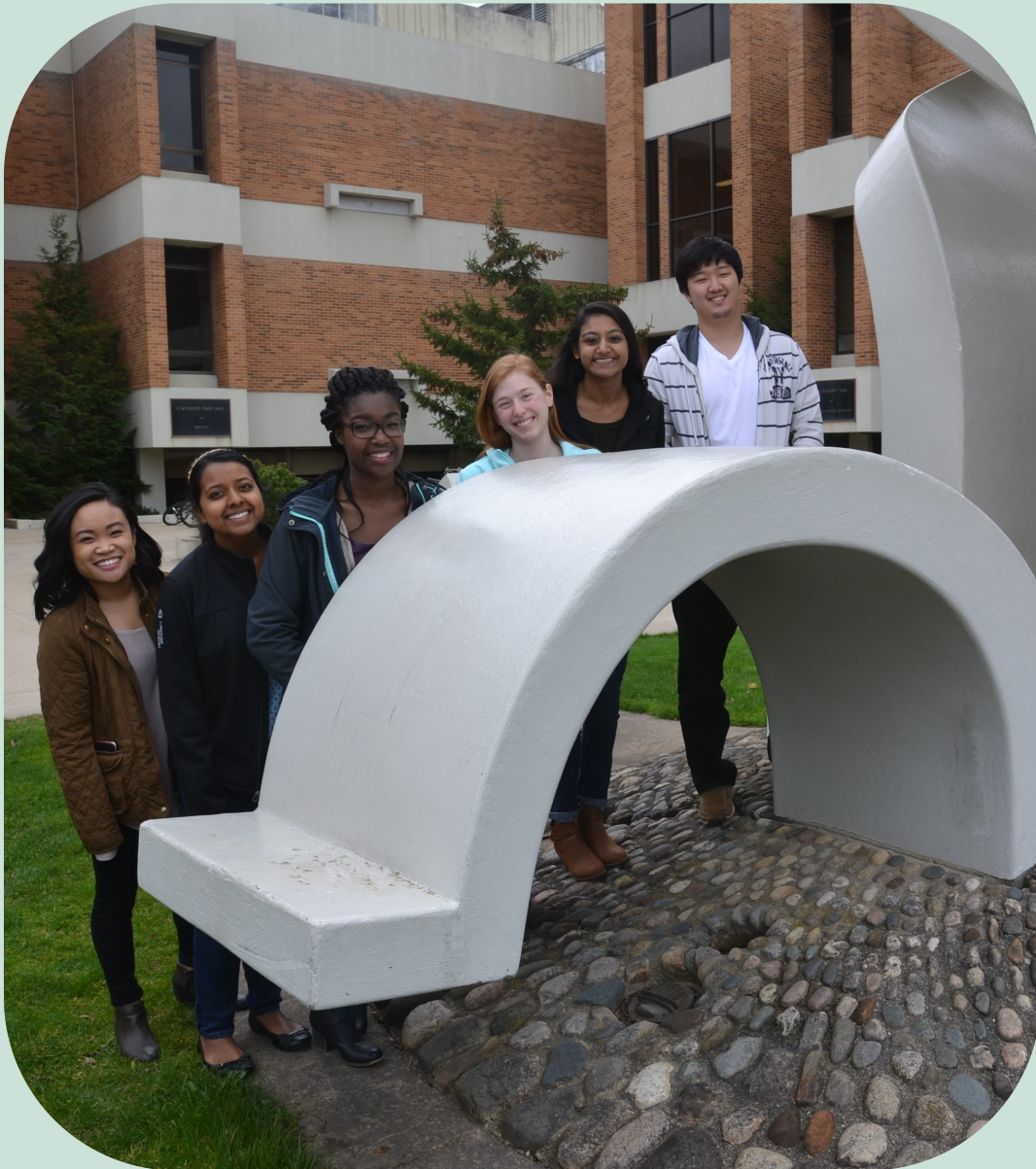
~ John Rorabeck  
Director BCFL



E-mail alumni updates and pictures to David Nowack at [chemistry@andrews.edu](mailto:chemistry@andrews.edu)



## We Say Good-bye to our 2016 Graduates



**Pictured from left to right:** ***Adrienne Magsipoc*** is attending Loma Linda Medical School; ***Joanna Moses*** is at Loma Linda Dental School; ***Monica Hamilton*** is in Boston at Tufts University Dental School; ***Emily-Jean Bankes*** is in an analytical chemistry graduate program at University of Pennsylvania; ***Iris Peter*** is gaining clinical experience in preparation for Physician's Assistant training; ***Tokin Kim*** is at Loma Linda Dental School.

**Not pictured:** ***Seth Campbell***, after graduating in December 2015, spent one semester teaching elementary school before heading to medical school at Loma Linda University; ***Naude Pierre*** is in Kalamazoo helping to care for her younger sisters while she explores further study in public health or medicine; ***Ji Yeon Lee*** returned to Korea after graduation to work in a dental clinic near her home.