



## In Conjunction with the American Chemical Society Student Affiliates at the University of Pittsburgh



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### WELCOME BACK!

Hello all and welcome to 2015! It's another year and another start to a new semester. Hopefully the holidays were relaxing, enjoyable and allowed you time to think about what is ahead. In light of another new year, I have been thinking about beginnings and endings. It is the beginning of the end of my undergraduate time at Pitt and though I am glad that I will be moving on next August, I am also sad to go.

I have asked myself about what I have enjoyed about my time at Pitt and what I would have changed. Something that comes to mind that has enhanced my time at Pitt has been doing things outside of the planned classes in my major. Last spring, I took a basic web design course that had no prerequisite. I thought it would be cool to be able to make my own website and understand how web design works. I liked the class so much that I ended up taking the next web design class last semester, even though it only counted as an elective. I found, however, that a seemingly unrelated class still overlapped into other classes, like the computational chemistry class that I took last semester as well. Though my computer science class by no means explained the complex algorithms in computational chemistry, it still gave me an idea of what the molecular programs meant and I was better able to appreciate the complexity that went into the program design.

Another interesting thing I tried was taking a semester of piano lessons. I had stopped playing in high school, but wanted to pick it back up again after not playing for a few years. Though it was harder than I thought, it was still rewarding (and nerve-wracking) to play at my end of semester recital. I have had many experiences in trying new things at Pitt, and though not all of them stuck, they were interesting and entertaining deviations from my course of study that also prevented a monotonous schedule.

Though many people make resolutions for the New Year, I sometimes find them to be overbearing and stressful in light of another start. Instead, I set short terms goals that encourage me to explore new things, like take a class in a new department or join a sports team. Maybe you have thought about learning a new language or taking your first international trip this year. Perhaps you want to spend the summer working somewhere new or maybe attend a concert. Maybe you want to get better grades or TA for a class. Whatever it is, I would encourage you to take a little risk and explore something new. Keep life interesting by stepping out of your comfort zone and being adventurous. It is never too early to do so, but sometimes you can run out of time.

"Most men either compromise or drop their greatest talents and start running after, what they perceive to be, a more reasonable success, and somewhere in between they end up with a discontented settlement. Safety is indeed stability, but it is not progression."—Cris Jami

Sincerely,

Anisa Mughal, Co-Newsletter Editor

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Visit us at <http://www.chem.pitt.edu/acs-sa/>

# A Salty Situation

by: Keith Kennedy

Anyone who has lived through at least one Pittsburgh winter is familiar with the methods that are used in order to control the build up of snow and ice. When the winter months arrive, the sidewalks and roads start to become peppered with rock salt crystals. Purple, blue, and clear, they cover just about every place where a car or person might travel. Most know that the rock salt is used to melt snow and ice or prevent its buildup but the way that it does this is not common knowledge.



Rock salt works on the principles of freezing point depression. Freezing point depression refers to the process in which a solvent dissolves a solute, lowering the freezing temperature of the resulting solution. In the case of rock salt, the salt is the solute and the H<sub>2</sub>O, ice or snow is the solvent. As the salts dissolve into the water, the freezing point begins to decrease. When enough salt dissolves, the freezing point of the water will decrease to a value below the outdoor temperature. At this point the water and salt mixture will transition to liquid form. In this way the rock salt “melts the ice.”



The extent to which a solvent is able to depress the freezing point is affected by a few major factors. One of these factors is the number of ions produced. Generally, the more salt ions that are dissolved, the more the freezing point decreases. This means that salt complexes containing more ions per mole will be more effective in depressing the freezing point. In addition, the identity of the ions dissolved affects the extent to which the freezing point can be depressed. For example, calcium chloride (CaCl<sub>2</sub>) is able to bring the freezing point of water down to -29°C (-20°F) while sodium chloride (NaCl) can only bring the freezing point of water down to -9°C (15°F). This means that different salts might be used depending on the temperature of the environment.

One thing that I had always wondered about the salts that are used to remove the ice from the streets, is why are there so many different colors of salt. I would notice that one day the salts would be all clear and the following day the salt would be a blue or purple color. I wondered if this color change is representative of a different salt being used or if it is just the result of impurities in the same salts.

When I began to research this topic, I found that these colors can be a result of a variety of things. Impurities are often the source of a color change, but, often times dyes are added to allow people to see where the rock salt has been placed.

Finally, you can walk around Pittsburgh in the winter without the nagging question of how the rock salt is being used to keep your commute safe.

## References

[https://www.researchgate.net/publication/248232874\\_The\\_color\\_of\\_rock\\_saltA\\_review](https://www.researchgate.net/publication/248232874_The_color_of_rock_saltA_review)  
<http://chemistry.about.com/cs/howthingswork/a/aa120703a.htm>

# The Importance of Working on the DRDR

by: Rachel Fleisig



Over the past year, I have been able to work on a large project at the School of Dental Medicine called the Dental Registry and DNA Repository (DRDR). The ultimate goal of the DRDR is to create a database of patients' DNA and medical history, which would provide a resource to any future research projects looking to find correlations between DNA markers and different dental conditions and diseases. The DRDR lab, aside from compiling the database, also utilizes the information in it for its very purpose.

I had multiple roles this year for the DRDR. My main role was collecting saliva samples from patients being seen in the different dental clinics. This is obviously a necessary step in that it is how the project collects new samples. The database must be constantly updating in order to produce a larger pool of subjects. The larger the sample size of a successful study, the more likely it is that the findings are conclusive and real.

Another portion of my research included de-identifying general patient information. This step is extremely important in ensuring the confidentiality of each participant in the study. The IRB certification requires confidentiality, and potential participants are informed that researchers in the lab do not have any personal information; they only have the patient's dental information and saliva sample.

My last job has been organizing patient radiographs and de-identifying them. For researchers utilizing the DRDR, having pertinent x-rays of the dental condition they are researching is a fantastic resource. For example, correlations between certain diseases and a larger amount of cavities have been found. Radiographs were very important in this finding. Again, in order to be used for the project, they must be de-identified, which is why my work as a researcher is important in that area.





*The University of Pittsburgh  
Department of Chemistry*

*is proud to announce*

*The Wass and McKeever Summer  
Undergraduate  
Research Fellowships*

- The Undergraduate Research Fellowships will be awarded this Summer, 2014.
- This Fellowships will provide a Summer stipend of \$3,500.00 to the recipient for work carried out in the research lab of our faculty member.
- Please submit a letter of recommendation from a Faculty Mentor which includes your qualifications and details of the planned research project (1-2 pages) and a one page personal statement of your future goals to **Dr. George C. Bandik in Room 107 Chevron Science Center by February 13, 2015**. All nominations will be reviewed by our Undergraduate Curriculum Committee and the recipient will be recognized at our Undergraduate Spring Term Awards Ceremony within the University of Pittsburgh, Department of Chemistry.

*Deadline to receive all materials for both Fellowships is February 13, 2015.*



# The Department of Chemistry of the University of Pittsburgh and The Valspar Corporation

*are pleased to announce*

## The Valspar Corporation Award in Chemistry

The Award will be made in Spring 2015 to one or more outstanding chemistry majors completing their sophomore or junior year. The award consists of a three month paid internship for Summer 2015 in the Valspar Laboratories in Pittsburgh, plus a \$2,000 scholarship to be used to attend the University of Pittsburgh during the student's junior or senior year.

### *Criteria for the award are as follows:*

- a) The student must be a non pre-professional chemistry major at the University of Pittsburgh.
- b) The student must have a 3.0 or higher grade point average at the time of selection.
- c) Where applicable, financial need will be considered.

### *To apply for the award:*

- 1) Complete and submit an application form (available in 107 Chevron Science Center).
- 2) Submit an unofficial transcript of all undergraduate work.
- 3) Arrange for a letter of reference (from a member of the University of Pittsburgh faculty) to be submitted.

### *Materials are to be submitted to:*

Dr. George C. Bandik  
107 Chevron Science Center  
Department of Chemistry  
University of Pittsburgh  
Pittsburgh, PA 15260

**Deadline for all application materials is  
January 30, 2015**

# 2014 January ACS-SA Schedule

**09** Officer's Meeting

**16** Valspar Corporation

Kevin Romagnoli, B.S.

*University of Pittsburgh*

*Department of Chemistry Graduate*

**23** Welcome Back Party

*Reservations REQUIRED*

**30** Green Chemistry in Pittsburgh

*with Katie Tuite, GAI, Pittsburgh*



## ***Hoagies and Sample Exams yet Again!***

Our most visible activities are the ACS hoagie and Chemistry Exam sales. Just about everyone having a Chemistry Lab class in Chevron has at one time or another eaten an ACS hoagie from Uncle Sam's while studying. The funds raised by these sales help to defray the weekly meeting expenses for refreshments and other incidentals as well as the cost of the food and supplies at our social functions.

Hoagies are sold on Tuesdays throughout the semester.



## ***I Need a Job!***

It's that time of year! Time to begin the search for a summer position. There are several opportunities for summer work available to Chemistry majors.

The first place to look is the Chem Major News area of the first floor hallway. Here you will find the current Research Experiences for Undergraduate (REU) listings. They are from all over the country.

You may also want to visit Career Services (2nd floor WPU).

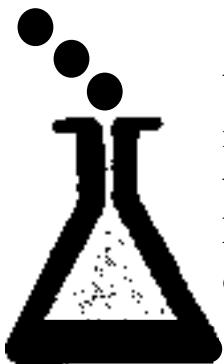
Mr. Richard Fann can help you with opportunities available through their Office.

Finally, don't forget the Arts and Sciences Office of Experiential Learning (B-4, Thaw Hall). Mr. Patrick Mullen can assist you there.

With all of these opportunities available, it should be an exciting and productive summer for everyone. Good Luck!

# Diversifying the Next Generation of Scientists

By: Trevor Hyland, Newsletter Co-Editor



What are things made of? How is our world held together? Why do some objects float in water and others do not? Why do salt and sugar dissolve differently in water even though they look so similar? These are just a few of the questions that have been answered by SCIENCE! But what about the uncertain future of science? Who will address the questions that have not yet been answered?

The Saturday Science Academy at Chevron Science Center is a semi-annual event conducted by the ACS-SA with the primary goal of providing an exciting, hands-on learning experience to local high school students who show interest in the sciences. These ambitious young scholars are given the opportunity to interact with undergraduate and graduate student volunteers, conduct experiments in general and organic chemistry, and learn the importance of both analytical and synthetic chemistry in the scientific industrial community. Typically, the program includes simple experiments and demos that help to illustrate many of the concepts that explain the world around us, some of which include the measurement of pH levels, performance of acid base reactions, and the making of crystal gardens.

Students of all backgrounds are welcome; however, the Saturday Science program is largely focused on providing hands-on experience to local minority and female students, in the hope that the future will bring increased diversity in the sciences. Furthermore, ACS-SA is committed to having a positive impact in the local community and the Saturday Science program is a great way to do so by encouraging local high school students to pursue their interest in the sciences, regardless of race, gender or economic status. The SSA program has had great success in the past, at one point seeing over 90% of local high school participants get accepted into the universities they applied to, and the ACS-SA seeks to continue this trend by bolstering outreach and raising awareness of the program and its benefits. In order to continue growing and strengthening the Saturday Science Academy program, additional help is needed, so if you are passionate about science and eager to have a positive impact in your community, please consider taking part in this exciting and rewarding experience. For more information or to find out how you can help, please email the ACS-SA Outreach Coordinator, Ryan Rothman, at [rhr12@pitt.edu](mailto:rhr12@pitt.edu) or attend one of our weekly meetings on Friday at 12:00 Noon in 150 Chevron Science Center.

The University of Pittsburgh, American Chemical Society-Student Affiliates

