



# Chemistry Outlook

An Activity of  
The Committee on Chemistry in the Two-Year Colleges  
Division of Chemical Education  
American Chemical Society

Website: <http://2yc3.org>

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*Scott Donnelly, Chair*

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Nitrogen

## Notes From The Chair

Scott Donnelly  
Arizona Western College  
Yuma, AZ

To begin, I'm Scott Donnelly, 2YC<sub>3</sub> Chair for 2015. On behalf of the officers of 2YC<sub>3</sub>, thank you for your membership in the Two-Year College Chemistry Consortium, a non-profit organization dedicated to the professional development and the free exchange of ideas amongst two-year college chemistry faculty. Many thanks to past-Chair Neil Bastian for his resolute commitment to 2YC<sub>3</sub> and for his work furthering its cause. And lest I forget, Athbhliain faoi mhaise dhaoibh, Happy New Year in Gaelic Irish!

The goals of my first Notes from the Chair composition are to provide a brief background about myself and then offer some preliminary thoughts about our noble and chosen vocation- teaching the first two years of college chemistry courses.

Last century (1995) I came to Arizona Western College (AWC) from upstate New York. The game plan was to acquire some meaningful college teaching experience in the desert and then head north to Alaska. But kismet intervened and I've been stuck (happily) on the 32<sup>nd</sup> parallel ever since.

I'm an avid woodworker and outdoorsman. Once the kids are out of the house I want to canoe the perimeter of all five Great Lakes and then walk the 3,400 or so miles across the northern US from coast to coast. My favorite national parks are Glacier NP in Montana and Isle Royale NP on Lake Superior. Enough about me...

Like you I teach the whole gamut of chemistry courses. Over the years

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Vol. 2014 – Issue IV



ACS  
Chemistry for Life®



**209<sup>th</sup> CONFERENCE**

March 20-21, 2015

Front Range Community College  
Westminster, CO

Contact: Denis Kissounko

Email: denis.kissounko@arapahoe.edu

**210<sup>th</sup> CONFERENCE**

May 22-23, 2015

Windward Community College  
Honolulu, HI

Contact: Christopher Guay

Email: cguay@hawaii.edu

**211<sup>th</sup> CONFERENCE**

September 18-19, 2015

St. Charles Community College  
Cottleville, MO

Contact: Beth Michael-Smith

Email: bmichael-smith@stchas.edu

**“Notes from the Chair” ...continued from page 1**

I've tried- oftentimes with reluctance and trepidation- this technique and that technique, this pedagogical strategy and that strategy. Not surprisingly, sometimes the techniques and strategies worked as I had hoped giving favorable results, and sometimes the results were miserable.

During my two decades in this endeavor I have developed certain tendencies and attitudes (e.g. biases) towards teaching. At times I've let my teaching biases- which in my reality is just another way of saying I'm really comfortable with what I'm doing now and have a comparably high activation energy to rid myself of that comfort- get in the way of trying something new. My kneejerk response would lead me to conclude that a new approach is just one of those current new-fangled, fancy trends or fads that, over a short time, will thankfully evaporate away into the educational netherworld of bogus ideas. Please just go away! as I roll my eyes yet again.

But as often happens when something new comes along, you try it just to try it. In doing so I end up

exposing my teaching biases and am surprised to find out that the new approach is in fact professionally uplifting, intellectually challenging, and from a pragmatic viewpoint a suitable pedagogical replacement for what I had been doing for years. Why didn't I do this earlier? The professional life of a college chemistry faculty makes for a good James Thurber short story.

What else have I learned? Teaching first- and second year college chemistry is like fishing and successful fishing is all about adapting to the situation one is dealt. Fishing for walleye is different than fishing for perch. In the analogy below the fisherman or woman is the faculty. The fish are your students.

Are you fishing a large, deep lake or a fast-flowing, shallow and cold stream, two aquatic environments with quite different habitats (analogous to, general vs. organic chemistry)? The habitats and sub-habitats (water depth, temperature, and turbidity, vegetation coverage, etc. = course topic coverage) in turn dictate the types of fish found (= students enrolled for various reasons). The types of fish present dictate what types of lures (= teaching techniques, strategies) are required to attract the fish and eventually hook them. Furthermore, where one casts the lure and the speed and depth at which the lure travels through the water column influence the success of hooking a fish.

In the fishing analogy above what do faculty have absolute control over? Namely, the lure. In the classroom this equates to the quality of lecture material, techniques, strategies, and delivery systems used. When fishing, it's necessary to change the type of lure, sometimes dramatically, because the fish aren't biting. In teaching it's necessary to change one's approach.

In closing, over the course of this year the lure in the fishing analogy above is the focus of my tenure as 2YC3 Chair. In each of the four Newsletters, beginning with this one, I'll share some ideas I've tried over the years and have learned from talented chemistry faculty that perhaps will prove useful in your courses.

Slán go foil (Goodbye)

**COCTYC AND SUPPORT STAFF  
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2015 Roster of Committee Members**

**Chair**

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**Chair-Elect 2016**

Elections to be held soon!

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**2YC<sub>3</sub> Membership Form**

Please consider supporting the 2YC<sub>3</sub> by becoming a member or renewing your membership. Annual dues are only \$25.

There is no longer a special rate on joint membership with DivCHED. If you are interested in joining DivCHED, please go to <http://www.divched.org/> and click the Membership link on the left.

**I wish to:** \_\_\_\_\_ Become a member of 2YC<sub>3</sub>  
\_\_\_\_\_ Renew my 2YC<sub>3</sub> Membership

**I am a:** \_\_\_\_\_ Two-Year College Teacher \_\_\_\_\_ Four-Year College Teacher  
\_\_\_\_\_ High School Teacher \_\_\_\_\_ Other

**Your Name:** \_\_\_\_\_

**Institution:** \_\_\_\_\_

**Address:** \_\_\_\_\_  
Street City, State 9-Digit Zip Code

**Phone:** \_\_\_\_\_ **Email:** \_\_\_\_\_

**Current Member of:** \_\_\_\_\_ ACS \_\_\_\_\_ DivCHED

Names of current members are posted on the 2YC<sub>3</sub> website. The list includes names, institutional affiliation, and membership expiration date only. Email addresses and phone numbers are NOT listed. If you do NOT want your name listed, check here \_\_\_\_\_.

- **Secure electronic payments for membership dues now accepted. Select 'Membership Form' on the 2YC<sub>3</sub> website to become a member.**

- **If paying by check, please send your check, payable to 2YC<sub>3</sub>, for \$25 to:**

**Thomas Higgins, Harold Washington College, 30 E Lake St, Chicago, IL 60601**

**209<sup>th</sup> 2YC<sub>3</sub> Conference  
Program Information**

***Chemistry Education Resources***

**March 20-21, 2015**

**Front Range Community College - Westminster Campus**

**3645 West 112th Avenue, Westminster, CO 80031 208<sup>th</sup> 2YC<sub>3</sub> Conference**

**Call for Papers**

We invite you to attend the 209<sup>th</sup> 2YC<sub>3</sub> Program on March 20-21, 2015. The conference will take place at Front Range Community College – Westminster Campus, located in the greater Denver area. We currently are looking for colleagues who would like to contribute to our program by giving a presentation, leading a workshop, or participating in a panel discussion. We especially encourage topics related to our theme “Chemistry Education Resources”. If you would like to present on a different topic, please do not hesitate to submit an abstract, as we encourage as diverse a program as possible. The due date for submitting abstracts is March 6, 2015.

**Program Highlights**

The first keynote speaker is Wayne E. Jones Jr. He is a professor and chair of the chemistry department at SUNY Binghamton. He has been the recipient of the Chancellor’s Award for Excellence in Teaching. As Director of the Center for Learning and Teaching, Dr. Jones’ teaching interests concentrate on the effective use and evaluation of technology in the classroom. These teaching interests involve long-term curriculum development in chemistry including more expanded use of technology in introductory chemical education, use of interactive multi-media materials for self-directed learning, and the design of new advanced undergraduate laboratories based on the guided inquiry approach.

The second keynote speaker is Jerry Suits, an associate professor from the University of Northern Colorado. Dr. Suits’ research focuses on the factors that affect how students learn chemistry. Currently, he is studying (a) how motivation and cognitive factors affect chemistry achievement, and (b) how interactive computer technology can stimulate active learning and developing thinking strategies that rely on visualization and other mental processes. His presentation is entitled, “Dynamic Visualizations and Student Conceptual Understanding of Chemistry Topics.”

Other scheduled presentations include a panel discussion on the “Chemistry Textbook of the Future.” The ACS will conduct a workshop entitled, “Get a Jump Start Using the ACS Assessment Tool for Chemistry in Two-Year College Programs.”

**Travel/Directions**

Denver International Airport (DEN) is the closest major airport to the conference venue and is served by all major airlines. Car rental, private shuttles, and taxicabs are available at the airport. Front Range Community College is located on 112th Street off Highway 36, Westminster exit.

**Lodging**

The Denver Marriott Westminster is accommodating 2YC<sub>3</sub> travels with a special rate of \$119 (plus tax). The

Marriott hotel is also the site of the Friday night social hour and banquet. On-line reservations should be made using the link on the conference website. Phone reservations should be made by calling 720-887-1177 and asking for the 2YC<sub>3</sub> room rate.

### **Registration and Conference Website**

Registration and up-to-date conference information can be found at the website listed below or by scanning the QR code.

<http://www.2yc3.org/php/meetings.php>

### **Contacts**

Dr. Denis Kissounko – Program Chair  
denis.kissounko@arapahoe.edu  
303-664-0394 ext 166

Jason Jadin – Local Arrangements/Exhibits Chair  
jason.jadin@rctc.edu  
507-285-7299

## **Get a Jump Start Using the ACS Assessment Tool for Chemistry in Two-Year College Programs: A Resources for Excellence Workshop**

You are invited to stay connected and develop solutions for excellence at the upcoming workshop, “Get a Jump Start Using the ACS Assessment Tool for Chemistry in Two-Year College Programs.” Two-year programs are under increasing pressure to perform self-assessments and document their outcomes. The ACS Assessment Tool for Chemistry in Two-Year College Programs is a resource to help your institution identify strengths and opportunities for growth in the context of the ACS Guidelines for Chemistry in Two-Year College Programs.

During this workshop, the assessment tool will be presented along with data as to how institutions use the assessment tool. Additional ideas on how to use the assessment tool will be discussed, and participants will have a chance to start working on a section of the assessment tool. Participants will leave with an action plan to complete part or all of the assessment tool. Our goal is to decrease the activation barrier for using the assessment tool.

“Get a Jump Start Using the ACS Assessment Tool for Chemistry in Two-Year College Programs“ will take place at the 209th Two-Year College Chemistry Consortium (2YC<sub>3</sub>) in Westminster, CO, March 20-21, 2015. Conference attendees can participate for free.

### **Workshop Facilitators**

Heather Sklenicka, Rochester Community and Technical College, Chair, Assessment Review Panel,  
Email: [Heather.sklenicka@rctc.edu](mailto:Heather.sklenicka@rctc.edu)

Olga Katkova, Truckee Meadows Community College, Co-Facilitator, Resources for Excellence Workshop  
Email: [okatkova@tmcc.edu](mailto:okatkova@tmcc.edu)

**210<sup>th</sup> 2YC<sub>3</sub> Conference  
Conference Announcement  
Call for Papers**

***Chemistry for a Sustainable Future***

**May 22-23, 2015  
Windward Community College  
45-720 Kea'ahala Rd., Kāne'ohē HI 96744**

We invite our colleagues to contribute to our program by giving a presentation, leading a work-shop, or participating in a panel discussion. We especially encourage topics related to our theme "Chemistry for a Sustainable Future", but we welcome other topics as well in order to create as diverse a program as possible. The due date for submitting abstracts is March 31, 2015.

Conference participants will have the option of attending a field trip to the facilities at the Hawaii Institute of Marine Biology, which is located on Coconut Island in Kaneohe Bay (<http://www.hawaii.edu/HIMB>).

Check our conference website for the latest updates and information:  
<http://windward.hawaii.edu/2yc3/index.html>

Please send abstracts and requests for further information to the Program Chairs:

Leticia Colmenares	<a href="mailto:leticia@hawaii.edu">leticia@hawaii.edu</a>	(808)-236-9120
Christopher Guay	<a href="mailto:cguay@hawaii.edu">cguay@hawaii.edu</a>	(808)-674-7339

**One if by land; two if by sea... The Call for Papers is coming!**

We're looking for your proposals for the August 16-20, 2015 ACS national meeting in Boston. Please email Meeting Co-chairs Iona Black or Beatriz McKee or Program Chair, Irv Levy, with your suggested symposia. Please note that the theme for this meeting is quite broad: "Innovation from Discovery to Application". Please think about ways that your symposium might also relate to the thematic programming.

In order to put your symposium up on the ACS MAPS system we would need the following information from you:

- Title of symposium
- Organizer(s) name/email
- Invited or contributed papers?
- Related to the theme "Innovation from Discovery to Application"?
- Suggested cosponsors, if any

A little bit later we will ask you for a 100-200 word description of the symposium.

Beatriz ([beatrizmckee@me.com](mailto:beatrizmckee@me.com)), Iona ([diblack4@gmail.com](mailto:diblack4@gmail.com)), and Irv ([irv.levy@gordon.edu](mailto:irv.levy@gordon.edu))

## Info About New Task Advisory Boards (TABs)

We have some initial plans for establishing two Task Advisory Boards (TAB) within 2YC<sub>3</sub>. Below are the general goals and expected outcomes provided to the respective TAB members. All of these goals are fluid in nature in that they will be changing as the groups develop a platform. If you would like to be a part of either of these two TAB groups, please contact me at [pmclevenger@iccms.edu](mailto:pmclevenger@iccms.edu).

### Planning Strategies for Social Media TAB

This committee will establish basic policies and protocols for using social media to communicate small amounts of information on a regular basis to all who choose to follow the feeds. The initial goals and implantation strategies are flexible in the sense that this is a constantly evolving area of communication. Emphasis should be placed on presenting a professional image and providing relevant information to general public. A high priority for the Social Media TAB is to promote 2YC<sub>3</sub> and retain memberships.

### Planning Strategies for History TAB

There is a rich history of dedicated members that have served the chemistry education community. Many of the original members are celebrating retirements. The History of 2YC<sub>3</sub> TAB has a great opportunity to create something special. This committee will collect and organize information pertaining to the history of the group and where this information will be housed.

## Registration is open for the 2015 ACS assessment review cycle!

Two-year college faculty and administrators are invited to register for the 2015 ACS assessment review cycle. The ACS Assessment Tool for Chemistry in Two-Year College Programs is a comprehensive form that helps the user evaluate chemistry and chemistry-based technology education at his/her institution within the context of the ACS Guidelines for Chemistry in Two-Year College Programs. The tool can be accessed and used anytime at [www.acs.org/2YGuidelines](http://www.acs.org/2YGuidelines). It is designed to support a variety of goals, such as program self-assessment, strategic planning, and collecting background for grant proposals.

In addition to the tool itself, ACS offers an annual review cycle for users interested in third-party feedback on their self-evaluation. Participants in the review cycle have the opportunity for personal guidance in completing the assessment tool and reminders for its timely completion. Participants who submit their completed tool by September 18, 2015, will receive detailed feedback on their institution's strength, suggestions for growth, and resources that may help.

Feedback is provided by the Assessment Review Panel, a group of two-year college chemistry faculty with experience completing and reviewing the assessment tool. Since the tool was released to the general public in 2013, 56 institutions have participated in the review cycle, and 30 have had their assessments reviewed by the Assessment Review Panel. The review cycle is free, open to all two-year colleges, and entirely confidential. Anyone interested in participating in the review cycle should complete the online registration form at [www.acs.org/2YGuidelines](http://www.acs.org/2YGuidelines) by June 3, 2015.

For more information on the assessment tool, Guidelines, and other resources, visit [www.acs.org/2YGuidelines](http://www.acs.org/2YGuidelines) or [www.acs.org/2YColleges](http://www.acs.org/2YColleges), or contact the ACS Undergraduate Programs Office ([2YColleges@acs.org](mailto:2YColleges@acs.org), 1-800-227-5558, ext. 6108).

**211<sup>th</sup> 2YC<sub>3</sub> Conference  
Conference Announcement  
Call for Papers**

***Gateway to the Future: Preparing Students for the Next Step***

**September 18-19, 2015  
St. Charles Community College  
4601 Mid Rivers Mall Drive, Cottleville, MO 63376**

We currently are looking for colleagues who would like to contribute to our program by giving a presentation, leading a workshop, or participating in a panel discussion. We especially encourage topics related to our theme which is focused on serving as a bridge for students to move forward into their career or academic futures. If you would like to present on a different topic, please do not hesitate to submit an abstract, as we encourage as diverse a program as possible. The due date for submitting abstracts is September 1, 2015.

The latest conference updates will be available on the 211<sup>th</sup> conference website coming soon.

Conference Chairs

John Bookstaver

Beth Michael-Smith

jbookstaver@stchas.edu

bmichael-smith@stchas.edu

### Connect with 2YC<sub>3</sub> online!

#### Facebook:

<http://www.facebook.com/twoyearchem>

Check out our fantastic Facebook page! See photos of conferences! Get updated 2YC<sub>3</sub> information! Make friends! Check it out today!



#### Twitter:

[twitter.com/2yc3](https://twitter.com/2yc3)

Get short, timely messages from 2YC<sub>3</sub>. Twitter is a rich source of instantly updated information. It's easy to stay updated on an incredibly wide variety of topics. Join today and follow "@2YC3".



### Passer Education Grants

*The Passer Grant is available to full time chemistry faculty at 2 or 4 year US colleges without graduate programs to help support continuing education. Awards may be used for short courses, advanced courses, or workshops (such as the cCWCS workshops held throughout the country). Upcoming applications for the program are due on April 1 and September 1. If you would like more information, visit: <http://www.divched.org/awards/dorothy-and-moses-passer-education-fund-0>. You may also contact the Chair of Passer Education Grant Review Committee, Sue Nurrenbern, at [nurrenbe@purdue.edu](mailto:nurrenbe@purdue.edu) or [scnurrenbern@gmail.com](mailto:scnurrenbern@gmail.com).*

In this year's survey, Two-Year College Chemistry Landscape: Emerging Trends and ACS Guidelines, a number of respondents expressed an interest in NSF resources for two-year colleges. NSF and ACS are happy to share the following NSF opportunities, all of which either target or are particularly interested in two-year colleges.

- Advanced Technological Education Program (ATE)  
Funding for partnerships that focus on the education of technicians in STEM fields
- Community College Innovation Challenge  
Contest for student teams to develop innovative challenges for some of our biggest problems
- Improving Undergraduate STEM Education (IUSE)  
Broad NSF program to support increased graduation of students from STEM programs
- STEM-C Partnerships: MSP  
Funding to support innovative partnerships to improve teaching and learning in science, technology, engineering, and mathematics, including computing (STEM-C) disciplines
- S-STEM Program  
Funding for institutions to provide scholarships to students in STEM fields
- Louis Stokes Alliances for Minority Participation (“Bridge to the Baccalaureate” track)  
Funding to increase participation of underrepresented minorities in STEM fields
- Robert Noyce Teacher Scholarship Program  
Funding to support efforts to encourage talented STEM majors and professionals to become K-12 teachers
- Tribal Colleges and Universities Program (TCUP)  
Funding for Tribal Colleges and Universities, Alaska Native-serving institutions, and Native Hawaiian-serving institutions to promote high quality science, technology, engineering, and mathematics (STEM) education, research, and outreach

The NSF also provides a Grant Proposal Guide to help you through the grant process. Of course, reviewing proposals is a great way to learn how to write them. Complete the reviewer recruitment form on the DUE homepage if you are interested in becoming a reviewer.

More funding opportunities, two-year college data, and other resources are available at:

<http://www.acs.org/2YColleges>

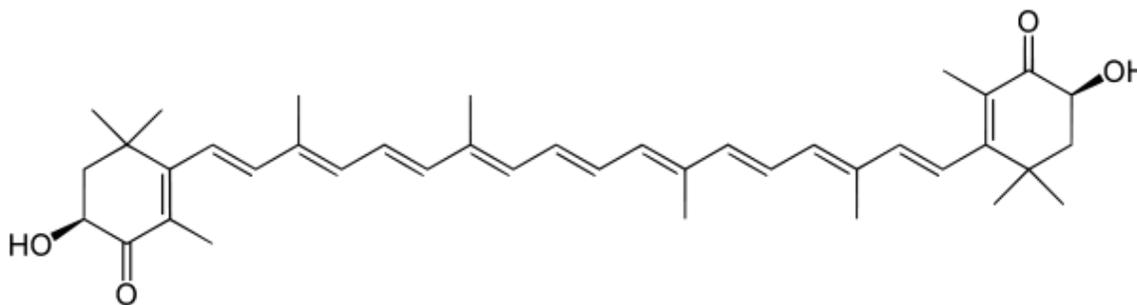
# Fishing for Chemistry

by Scott Donnelly

Arizona Western College, 2020 South Avenue 8E, Yuma, AZ 85365

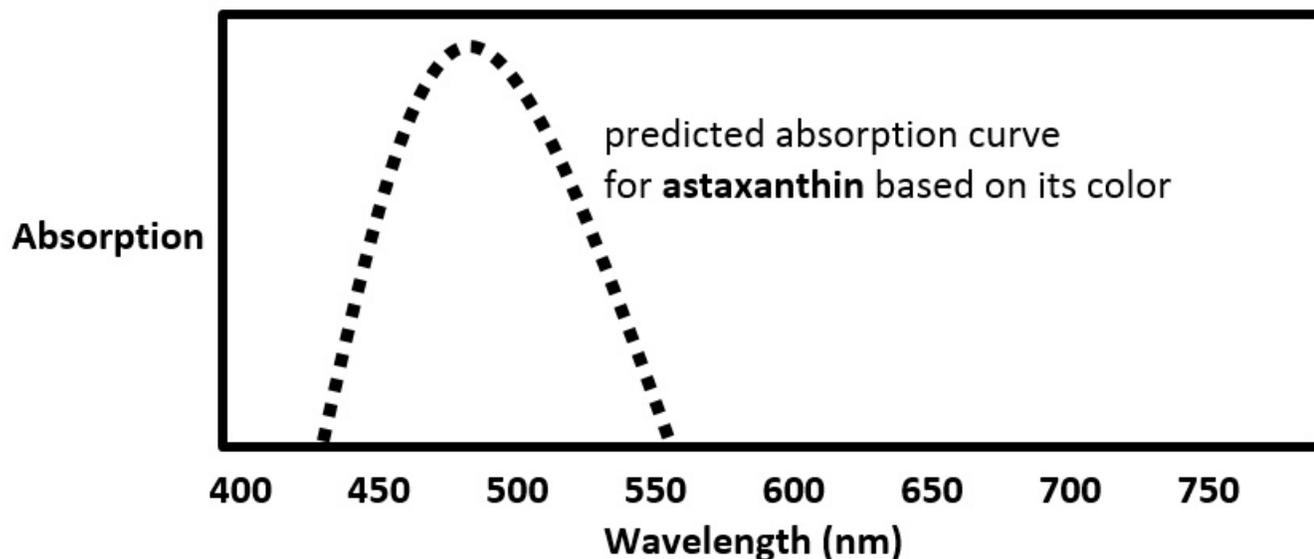
In the Notes from the Chair, I (SJD) wrote how teaching chemistry is like fishing. In this short column I'll write about how fish can be used to illustrate the utility of chemistry and certain chemical principles. Perhaps such an approach, when used in its proper context, will 'hook' students into believing that chemistry is not just some barrier course that impedes progress towards completing their degree program. Sounds fishy, right?

Fish either have red or white meat (= muscle fiber). Think tuna or salmon versus catfish or cod. On the package label of farm-raised Atlantic salmon is found the following phrase or something similar, Colorant Added. This phrase applies to farm-raised but not wild-caught salmon. Two questions with chemistry connections immediately come to mind- 1. What is the colorant?, and 2. Why is it added? The colorant is astaxanthin, a chiral, extensively  $\pi$ -conjugated and structurally rigid member of the carotene family.



Synthetic commercial astaxanthin is added to the feed (and not directly to the flesh) because the meat of farm-raised Atlantic salmon is gray. Wild salmon meat is pink-red so it would be hard to sell a fish labeled as 'salmon' to an increasingly food-savvy public when the meat is gray and not pink-red. Otherwise, red flags would arise. (Sorry, but I had to write that). The red colored meat of wild salmon, which spend most of their lives in the salty environs of the ocean, is obtained from diet, namely the ravenous consumption of plankton and krill, both of which contain astaxanthin and, in lesser amounts, its achiral fraternal twin canthaxanthin, which is red too but lacks the hydroxyl groups.

Now that you have students' attention by relating chemistry to a topic they are familiar with or can identify with, what chemistry can be taught? First, astaxanthin is red in solution so have students draw its predicted visible absorption spectrum. This simple activity connects a physical observation to a chemical concept. From students' drawings you'll get a clear idea if they understand that a color seen in a non-turbid liquid means that that color is transmitted.



What else? Astaxanthin is loaded with  $sp^2$ -hybridized carbon double bonds ( $C=C$ ) linked in an uninterrupted alternating series (conjugation) from one end of the molecule to the other end. Have students speculate about what would happen to astaxanthin's color- if anything at all (I always like to add this 'disclaimer' of sorts because a change in something doesn't necessarily mean that this in turn will induce a measurable change somewhere else)-, if, say, one or more of the  $C=C$  bonds are reduced, thereby disrupting the linked, delocalized  $\pi$ -conjugated system and reducing the structural rigidity with the change from  $sp^2$ -hybridized trigonal planar to  $sp^3$ -hybridized tetrahedral geometry about the reduced carbons in the acyclic chain.

And/or have students speculate about the following. Suppose one of the trans-dialkyl substituted  $C=C$  bonds is converted to an alkyne. Conjugation is conserved but would this structural change from a  $120^\circ$  to  $180^\circ$  bond angle impact astaxanthin's visible absorption spectrum, perhaps resulting in either a measurable bathochromic (red) or hypsochromic (blue) shift? Have students use molecular models to predict the changes in bond angles and dimensionality about the bond when the carbons are changed from  $sp^2$  to  $sp$  hybridization.

And what about astaxanthin's stereoisomeric relationships? How many of the  $C=C$  bonds are E or Z? Would astaxanthin's melting temperature change if one or more of the  $C=C$  bonds were Z? Furthermore, have students identify the four stereoisomers associated with the two chiral carbons.

Or perhaps you can ask students this introductory question before discussing molecular structure- What do farm-raised Atlantic salmon and zoo (= non-wild) flamingos have in common? A diet containing astaxanthin.

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Scott Donnelly, CHAIR  
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COMMITTEE ON CHEMISTRY  
IN THE TWO-YEAR COLLEGE  
Division of Chemical Education  
American Chemical Society

## An Invitation for Submissions to the Chemistry Outlook

*From the Editor:* Any and all members of 2YC<sub>3</sub> may consider submitting interesting and relevant articles, commentary, announcements, job postings or photographs for inclusion into the Chemistry Outlook. *Do you have an interesting and relevant story to tell about your past 2YC<sub>3</sub> experiences? Do you have an interesting classroom activity you'd like to share? How about a demonstration or a teaching technique that you think works especially well? In the past we have published conference commentary, "It Works for Me", photographs of students excelling at presentations and workshop announcements.*

Submissions should be fairly short so that we can include more in the newsletter. Submissions may be published on an editorial appropriateness and space-available basis, and should be typed in Times New Roman font, single-spaced, 12-pt. I look forward to hearing from you!

**The deadline for Volume II (2015) is February 15, 2015.**

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