

IMWSCC

Intermountain West Society of Cosmetic Chemists

IMWSCC Board

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with any questions/
suggestions you
have

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Antioxidant Enzymes

Natural antioxidant enzymes manufactured in the body provide an important defense against free radicals. They are protein molecules located in the cytoplasm. Unlike exogenous antioxidants, which are generally depleted by antioxidant action, antioxidant enzymes are not depleted because they act catalytically.

These enzymes are responsible for most of the antioxidant work in a body; none of the “expendable” low molecular weight antioxidants can compete with antioxidant enzymes in amount of neutralized (discharged) free radicals. It does not mean that exogenous antioxidants are not important: they also play an

important role in fighting free radicals, because of their structure, properties, and specific localization.

Most of these enzymes contain metal in the structure. That is why mineral supplementation is crucial to maintain a healthy level of antioxidant defense.

Some major representatives of antioxidant enzymes class:

Superoxide dismutase (SOD)

SOD converts superoxide radicals (the most widely occurring radical in the body) into oxygen and hydrogen peroxide. Hydrogen peroxide then turns to water by catalase.

There are two types of SOD in



Antioxidant Enzymes Continued:

majority of cells: copper-zinc SOD (Cu/Zn) in cytoplasm and manganese SOD (Mn SOD) which located in mitochondria.

There is evidence of increasing SOD activity as a result of supplementation with copper and zinc.

Catalase

This iron-containing enzyme is responsible for conversion of hydrogen peroxide to water.

Glutathione/glutathione peroxidase/glutathione reductase

Glutathione (GSH) – is a naturally synthesized tri-peptide containing thiol group (-SH). It only behaves as an effective antioxidant in presence of Glutathione Peroxidase (GPx) or Glutathione Transferase (GST). After reaction with free

radicals glutathione is turning to oxidized form (GSSG), and not effective anymore. However, another enzyme – Glutathione Reductase (GR), may reduce



glutathione back to original state. The small

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Antioxidant Enzymes Continued:

amount of glutathione may work very effectively for a long time only as a part of whole glutathione system.

GPx – the key enzyme of this system contains Selenium in structure.

Thioredoxin/thioredoxin reductase

As with the glutathione system, the thioredoxin system (thioredoxin/thioredoxin reductase) functions to maintain the cellular environment in a reduced state (decreasing disulfide cross-linking) and protects against free radicals. Thioredoxins are small (12 KiloDalton) proteins with an active dithiol (two -SH groups nearby because of cysteine residues) site: -Cys-Gly-Pro-Cys-. Thioredoxin Reductase reduces (donates hydrogen atoms) to regenerate reduced thioredoxin. Like glutathione peroxidase, thioredoxin reductase is a

A small concentration of bilirubin can protect against a 10,000-fold greater concentration of hydrogen peroxide due to the abundance and rapid action of biliverdin reductase in all tissues.

selenium-containing enzyme whose activity can be influenced by dietary selenium.

Bilirubin/Biliverdin reductase

Bilirubin is a powerful lipophilic antioxidant that protects membranes from lipid peroxidation and protects membrane proteins from oxidation. Much of the power of bilirubin as an antioxidant comes from the extreme rapidity with which biliverdin (oxidized bilirubin) is converted to bilirubin by biliverdin reductase. The enzyme heme oxygenase catalyzes the breakdown of heme (the heme of hemoglobin) to the products carbon dioxide, iron and biliverdin. Biliverdin is immediately converted to bilirubin by the enzyme biliverdin reductase. A small concentration of bilirubin can protect against a 10,000-fold greater concentration of hydrogen peroxide due to the abundance and rapid action of biliverdin reductase in all tissues.

About the Author:

Alexander B. Rabovsky was born during 1953 in Moscow, Russia (USSR). His formal education includes:

Russian State Medical University, Moscow, Russia

master, Ph.D. Biochemistry, 1987

Dissertation Title: "The removal of atherogenic lipoproteins from human blood by specific



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Antioxidant Enzymes Continued:

adsorbents.”

Moscow State University, Moscow, Russia Ph. D., Chemistry/Organic Chemistry, 1976.

He immigrated to the US in 1995, and is married, with two children. Alexander’s employment history consists of:

Melaleuca, Inc. Idaho Falls, ID 2007 – Present. USANA Health Sciences, Inc. Salt Lake City, UT 1995-2007. Linus Pauling Institute of Science and Medicine Palo Alto, CA 1995. Institute of Physico-Chemical Medicine Moscow, Russia 1983-1995. Institute of Organic Chemistry of Academy of Sciences Moscow, Russia 1976-1983.

His areas of scientific interests are:

Biochemistry, Analytical Chemistry, Clinical research, Free Radicals & Antioxidants,



Biochemistry Atherosclerosis, Inflammation and other Pathologies, Human Nutrition and Supplements

Alexander Memberships are:

The Society for Free Radical Biology and Medicine, and Inflammation Research Association.

Alexander’s Scientific Publications include:

70 publications, including 16 patents.



Alexander B. Rabovsky, Ph. D.

Through Your Hat Into The Ring - Run for the IMWSCC Board

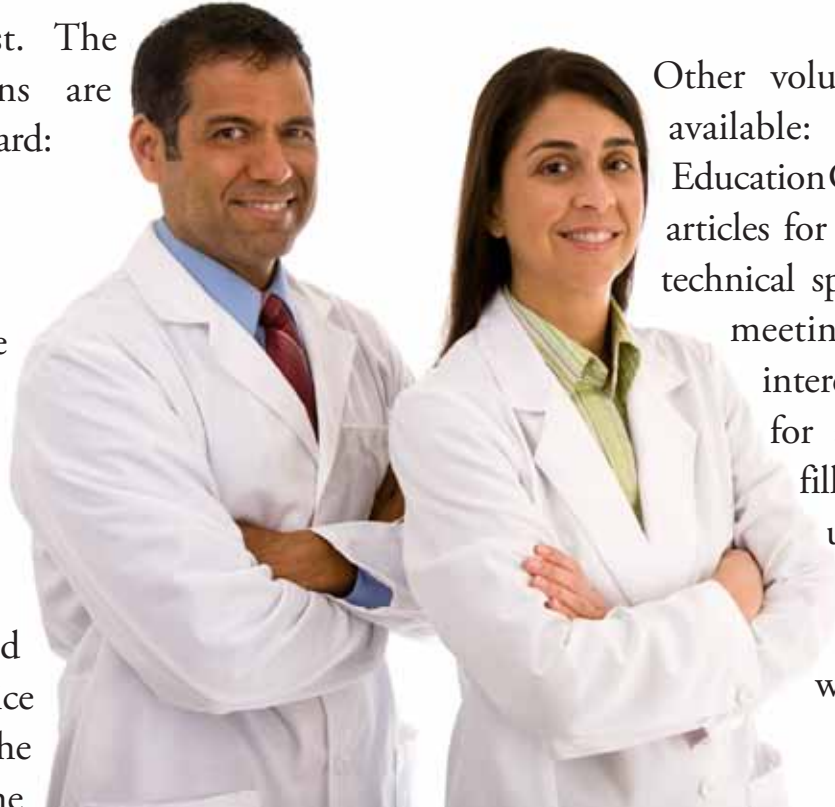
Changes are coming to the IMWSCC and you can be a part of it! People elected to serve in 2011 will serve for two years in that position unless noted otherwise. Entries for the positions must be received by September 1st. The following positions are available for the board:

- Secretary
- Treasurer
- Chair - Elect (note this is a four year commitment)

What you need to do:
If you are interested in running for office you need to read the descriptions (see the

website) of the position you wish to run for and formally submit your name to the IMWSCC via the form online. If there is no opponent for the position you are running for campaigning is not required.

Other volunteer opportunities available: Photographer and Education Committee: technical articles for the newsletters, and technical speakers for quarterly meetings. If you are interested in volunteering for any of these please fill out the form posted under the "2011 Elections" tab on the IMWSCC.org website.



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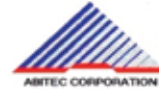
The advertisement features a background image of a laboratory setting. In the foreground, a hand in a white glove holds a test tube containing a green plant growing in a liquid. The background shows various laboratory equipment and a tiled wall.



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Job Posting: Technical Sales Support - USA and Canada

Description

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Requirements

Chemical, pharmaceutical degree holder or related science graduate. High potential to fit in a technical sales position or successful working experience at technical sales or related position are essential. Good interpersonal & relationship building skill and positive, active and aggressive mindset to achieve sales goals are essential. The position is based in Colorado but will include more than 50% travel to meet with potential customers and customers.

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Job Posting: Cosmetic Chemist – New Product Development Crabtree & Evelyn

Summary: This position will be responsible for completing projects within the Product Development laboratory. Daily duties include formulation of new products, design and execution of product testing, data management and technical support for other functional groups.

Essential Duties and Responsibilities: Includes the following. Other duties as assigned by Lab Manager.

- Conduct research on new formulations and competitive products.
- Develop concepts for new products based on individual ideas.
- Formulate stable new products based on marketing briefs and/or individual concepts.
- Prepare (or supervise the preparation of) laboratory batches
- Maintain accurate records of all formula development and specifications.
- Maintain stability files for all approved formulas in company database.
- Prepare ingredient listings for packaging and graphics.
- Work with the Purchasing Department and provide them with applicable new chemical data, vendor information and specifications.
- Transfer approved formulations and manufacturing procedures to internal manufacturing group and/or third party manufacturers.
- Communicate and interface with Production on manufacturing procedures. Provide technical support as needed.
- Provide color standards and finished product specifications to Q.A. Laboratory on new formulas.

• Problem solve for Product Development group.

Qualifications: The ideal candidate must be a motivated individual capable of working with little supervision. Candidate must be comfortable handling multiple new projects in parallel.

Candidate will be expected to provide support to the Product Development group, as well as technical support to the organization. Should be able to research and formulate new products as directed by the Lab Manager. Experience in Personal Care and Cosmetics industry preferred. Must have knowledge of current and relevant industry information (i.e.: raw materials, global regulations, etc.).

Education and/or Experience: Minimum requirements listed below:

- Bachelor's degree in Chemistry, Chemical Engineering, or related discipline. Previous course work in cosmetic science is preferred.
- Minimum of two to five years experience in a cosmetic laboratory with formulation and product development experience.

Interested candidates should Email resume and cover letter with salary requirements to hr@crabtree-evelyn.com.

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Ask the Expert

The Society of Cosmetic Chemists has organized Ask the Expert to provide an online forum for the exchange of ideas and new developments in cosmetic research and technology.

This new educational tool allows users to seek answers to questions on pre-selected topics relating to the cosmetic sciences. Each Thursday members on the pre-selected panel of experts respond to questions submitted to Ask the Expert. Questions must pertain to the designated topics and be received no later than Wednesday to receive answers Thursday of the same week. Questions should be as brief as possible.

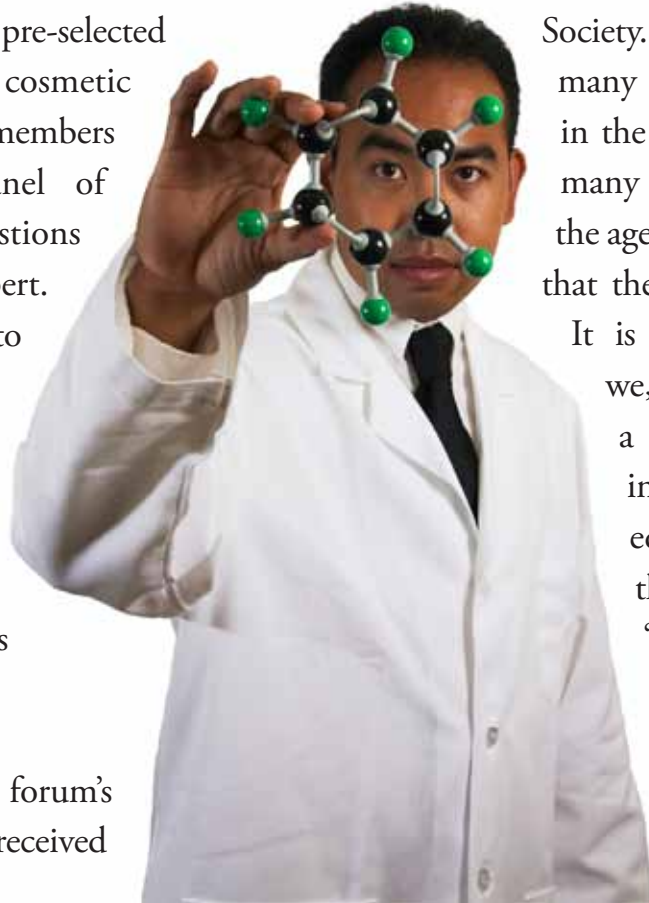
Users ask questions to the forum's experts, and answers are received within the week.

One of the most important functions of the National Society of Cosmetic Chemists is to provide as many educational opportunities for the membership

as possible. This is accomplished through many venues such as national scientific meetings and seminars, chapter meetings, chapter educational seminars, continuing education courses and the Journal of Cosmetic Science. Our members are

the most important resource of the Society. Within our membership are many experts with vast knowledge in the field of cosmetic science. As many of these members approach the age of retirement, the knowledge that they possess begs to be shared.

It is with great excitement that we, at National have introduced a new way to help share that information and continue the education of our members through this function called "Ask the Expert". The pool of experts include CEP instructors, consulting members, journal reviewers, monograph authors,



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A close-up photograph of a woman's face, looking slightly to the right. The background is a soft, light color.

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A photograph of a woman with her arms raised in the air, smiling. She is wearing a white top. The background is a clear blue sky.

Ask the Expert continued:

Journal authors, renowned scientists and recognized experts in particular fields. This service is free to members.

The response from our experts to this program has been one of excitement, and we hope you agree. We feel it is another benefit we can provide to the membership and general public to enhance their ability to excel in their jobs.

To Access this online tool go to: http://www.sconline.org/website/news/ask_the_expert.shtml or go to www.sconline.org then click SCC News then click "Ask the Expert".

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Up Coming Events

- Deadline to enter the race for IMWSCC Board: September 1st
- Chapter Meeting: Nov. 4th, 2010
- Dec. 9th-10th, 2010 Annual Scientific Seminar NYC
- February 24th Meeting at Thanksgiving Point
- February 25-27 Unofficial ski trip

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