

Education Group Breakout

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Objective

GC3 Advancing Green Chemistry Education project group explores ways to enhance green chemistry education in universities and through professional development

Portal- Education Series

- Why Green Chemistry Should be Mainstream
 - The Value of Green Chemistry
- Green Chemistry and Green Engineering Foundations
 - The 12 Principles of Green Chemistry: Sustainability at the Molecular Level
 - Introduction to Green Engineering **
- Toxicology
 - Toxicology and Why You Should Care
 - Integrating Toxicity Information into Chemical Design
- Environmental Laws and Regulations
 - The Role of Policy in Green Chemistry Research and Adoption **
- Purchasing/Marketing Green Chemistry Innovations
 - Training and Incentivizing Merchants to Purchase Sustainable Products **
 - Building Market Share for Green Products **





EDUCATION
PORTAL

Introduction

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Welcome to the GC3 Education Portal

To access webinars immediately, [click here](#).

Introduction

In May of 2012, representatives from our member companies expressed a need for education of their employees and supply chains in various aspects of green chemistry. In response, the GC3 Education Group developed a matrix of green chemistry education needs based on job functions within a company. Based on this matrix, the Education Group developed an online introductory green chemistry curriculum comprised of webinars from expert speakers, ranging from introductory talks to more advanced lessons in specific tools and applications of green chemistry. This curriculum might constitute a two-day in-person training. Supplemental reading materials were also gathered to expand upon the material in each webinar. The result is an Education Portal that we hope will provide a useful foundation for any business audience, such as purchasers trying to understand new corporate sustainability initiatives, formulators who need a grounding in toxicology, or even students seeking careers in green chemistry.

Using the Education Portal

The content of the Education Portal is organized by topic. The most recent webinars on the Education Portal are only available to GC3 members, who can [log in to the Member Area](#) to access them. However, webinars older than a year will be made free to the public for educational purposes. To view the webinars, [click here](#) to access the descriptions, then click on the title of a webinar for more details and a link to view the video. Slides without video are also available on the details page.

Chemistry Rating

Each presenter has been assigned a *chemistry rating* indicating the level of chemistry knowledge recommended for viewing their presentation. The ratings range from 1, indicating no specific chemistry knowledge needed, to 5, indicating an advanced chemistry education is recommended.

Additional GC3 Educational Efforts

A number of GC3 companies committed to accelerating green chemistry education through the GC3 Policy Statement on Green Chemistry in Higher Education. To read about this and other efforts, visit the Education Group page [here](#). If you'd like to participate in projects like these, contact [Saskia van Bergen](#) about joining the GC3 Education Group.

Feedback

We welcome feedback on the Portal as well as ideas for additional webinars. Please e-mail Saskia van Bergen at saskia.vanbergen@ecy.wa.gov if you have any questions or comments.

<http://www.greenchemistryandcommerce.org/education-portal/introduction>

EDUCATION PORTAL

Introduction

Webinars

Toxicology and Why You
Should Care

Integrating Toxicity
Information into Chemical
Design

Introduction to Green
Engineering

The Value of Green
Chemistry

Building Market Share for
Green Products

In Pursuit of Green
Chemistry: Perspectives
on Careers in Industry

Presenters

GC3 Webinars

A full list of our webinars is shown in the table below. Click on any webinar title (in the first column) to learn more about the webinar and to view an archived version. You can also click on a presenter's name to read a brief bio.

Webinar Title	Description	Presenters	Chemistry Rating
Foundations for Green Chemistry and Green Engineering			
Introduction to Green Engineering	Green engineering applies principles similar to those of green chemistry to process and product design. In this webinar, experts in green engineering introduce principles, tools, and examples of this practice.	Julie Zimmerman , Associate Professor of Environmental Engineering, Yale University	1
		Matthew Eckelman , Assistant Professor of Civil and Environmental and Engineering, Northeastern University	1
		Julie Schoenung , Professor and Vice Chair of Chemical Engineering and Materials Science, University of California Davis	1
Green Chemistry in Business			
The Value of Green Chemistry	Green chemistry leaders in industry discuss their efforts to build awareness and make a case within their firms, supply chains, and customers on the value of green chemistry.	Helen Holder , Corporate Material Selection Manager, Hewlett-Packard	1
		Tse-Sung Wu , Program Manager of Environment, Health, and Safety, Genentech	1
		Andy Shafer , Executive Vice President of Sales and Market Development, Elevance Renewable Sciences	1
Building Market Share for Green Products	Is it better to advertise oneself as a green company, or to focus exclusively on product performance? Three companies share their approaches to marketing their sustainable practices.	Steve Davies , Director of Public Affairs & Communications, NatureWorks	1
		Saskia van Gendt , Captain Planet, Method	1
		Charlie Forslund , Principal, Material Innovation Exploration, Steelcase	1
In Pursuit of Green Chemistry:	As a new field, green chemistry has yet to establish a fixed route for career success. Professionals from different sectors	Cory Robertson , Environmental Chemist, Hewlett-Packard	1

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Webinars

Toxicology and Why You Should Care

Webinar Listings

Webinar Description

As companies review or develop new products and production processes, chemicals that may be of concern can be designed out. One field that is essential for the design of safer chemicals, materials and processes is the field of toxicology. Historically, the fields of chemistry and toxicology have worked separately—with one focused on design and the other on environmental health and safety. By bridging the gap between chemistry and toxicology, innovative, safer products can be developed and regrettable substitutions can be avoided.

In this webinar from the GC3 Green Chemistry Education series, three toxicologists—Drs. Steven Gilbert, Cal Balcer-Anderson, and Rob Roy—provide an overview of the science of toxicology and how it can be used to design and evaluate safer products.

View the Webinar Online

[Watch on Vimeo](#)

Download Webinar for Offline Viewing

- ▶ Standard Definition 360p (92MB)
- ▶ High Definition 720p (160MB)

Presenters

**Steven Gilbert**

Director, Institute of Neurotoxicology & Neurological Disorders

Chemistry Rating: 2

▶ [Read Biography](#)

▶ [Jump to Presentation](#)

**Cal Balcer-Anderson**

Toxicologist, US Environmental Protection Agency

Chemistry Rating: 1

▶ [Read Biography](#)

▶ [Jump to Presentation](#)

**Rob Roy**

Lead Toxicology Specialist, 3M Medical Department

Chemistry Rating: 1

▶ [Read Biography](#)

▶ [Jump to Presentation](#)

Learning Objectives

- Understand the definition and basic principles of toxicology, and the role of toxicologists in green chemistry
- Learn about methods for hazard evaluation in chemical selection and alternatives assessment
- Understand the difference between risk and hazard

Recommendations for Prerequisites

This webinar is suitable for all audiences.

Additional Reading

A Small Dose of Toxicology, by Stephen Gilbert

<http://www.toxipedia.org/display/hwt/A+Small+Dose+of+Toxicology%2C+2nd+Edition>

National Research Council: How New Toxicology Can Catalyze Green Chemistry

<http://nas-sites.org/emergingscience/files/2011/05/green-chem-nl-25.pdf>

National Library of Medicine Toxicology Tutor 1

<http://sis.nlm.nih.gov/enviro/toxtutor/Tox1/index.htm>

National Library of Medicine Toxicology Tutor 2

<http://sis.nlm.nih.gov/enviro/toxtutor/Tox2/index.htm>

Berkeley Center for Green Chemistry: The Basics of Toxicology for Green Molecular Design

<http://bcgc.berkeley.edu/toxicology-basics-green-molecular-design>

Additional Topics

- Why Green Chemistry Should be Mainstream
 - Green Chemistry Innovations- Business Examples
- Green Chemistry and Green Engineering Foundations
 - Green Chemistry Tools/Metrics for Synthetic Chemists
- Identifying and Evaluating Safer Alternatives
 - Introduction to Alternative Assessment and Life Cycle Assessment
 - Transitioning to Safer Chemicals
 - Chemical Hazard Assessments and List Translators
- Communicating Green Chemistry
 - Internal Communication/ Supply Chain Communication

Fellow(s) Program

- Objective: To place technically proficient students into sustainability-related summer internships with our member companies.
- Length: 10-12 weeks
- Current graduate student OR recent recipient of bachelor's degree (<6 months since graduation)
- Invited to attend the 2016 GC3 Innovators Roundtable and share their experiences with the 2nd year of students.

Webinars for Students

- **GC3/NESSE**
 - In Pursuit of Green Chemistry: Perspectives on Careers in Industry
 - *Cory Robertson, Environmental Chemist, HP*
 - *Drummond Lawson, Environmental Chemist, Arcteryx*
 - *Kristi Budzinski, Green Chemistry/BioPharma Program Manager, Genentech*
- **NESSE/GCC**
 - Student Lead Initiatives
- **ACS-GCI**
 - Green Chemistry Clubs

Future Plans

- Continue populating Education Portal
- 2nd year of Fellows program
 - Survey for interested companies (May or June)
- Annual student series partnering with NESSE, GCC, ACS-GCI
- Additional Signatures to Policy Statement on Green Chemistry in Higher Education

Additional Ideas

- GC3 Outreach Education Webpage
 - Short stories of member outreach activities
 - Some example activities and Green Chemistry outreach resources
- Green Chemistry in Education Summit

Ideas/Comments?

