

CONSUMER PRODUCTS SAFETY & SUSTAINABILITY

16:963:634

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Course Description: This is a 2-credit elective course designed to better prepare graduate students for employment in the consumer products industry. The students enrolled will be expected to attend and participate to the classroom activities as well as to successfully take the mid-term and final exams in order obtain the credit. Graduate students will be responsible for all of the in-class material, assigned reading, and case-studies.

Course Objectives: The purpose of this course is to provide the learners hands-on knowledge on how to investigate, document, and support the safety of consumer products for the consumers and the environment by applying scientifically sound toxicological and sustainability approaches. The course will emphasize participation in hands-on exercises and case-studies designed to improve their understanding and retention of the course materials and help them gain the functional skills that are critical for a successful career in the consumer goods industry. Students will further develop their skills in the critical review of literature and expand their knowledge in areas of corporate toxicology.

Upon completion of this course, the learner is expected to:

- Understand the concepts of hazard and risk;
- Be able to identify the different types of adverse effects that should be considered for consumer goods exposure;
- Understand the different routes of exposures quantitatively and how they impact absorption and systemic dose;
- Be able to critically review and interpret the results of computational, in vitro, and in vivo models used for the safety evaluation of chemicals, while considering study quality and validity, and have a working knowledge of guideline studies;
- Have a working understanding of the risk assessment process as it pertains to product safety for the consumers, occupational health for the workers, and ecological impacts for the environment.

LECTURE SCHEDULE

Topics	Instructors
Introduction to Consumer Products Risk Assessment <ul style="list-style-type: none"> • Course overview • Definition of consumer products • Principles of Risk Assessment • Relationships with other functions • Different dossier support for cosmetic, medical device, medicinal product, IND submissions etc. 	D. Bagley D. Urbach-Ross
Hazard Identification – Local Endpoints (Skin / Eyes / Airways) <ul style="list-style-type: none"> • Specific endpoints for Safety Assessments • Individual endpoints, Guideline studies, human studies <ul style="list-style-type: none"> ○ Sensitization ○ Irritation ○ Corrosion 	L. Hutchison

Hazard Identification – Systemic Endpoints <ul style="list-style-type: none"> • Specific endpoints for Safety Assessments • Individual endpoints, Guideline studies, human studies <ul style="list-style-type: none"> ○ Systemic ○ Genotoxicity/Cancer ○ Reproductive/developmental/endocrine toxicity 	D. Urbach-Ross B. Wall
Hazard Identification - Data quality and availability <ul style="list-style-type: none"> • Data availability/gaps – Data requirements for clinical studies or national launch • Klimisch - data quality assessment • Decision tree, weight of evidence • Structure-Activity Relationships: Read across, in silico toxicology • Working without animal testing 	C. Harvey
Dose Response <ul style="list-style-type: none"> • Choice of the right No Observable Adverse Effect Level per product type • Role of concentration for local effects • Kinetics 	L. Hutchison C. Cheung
Exposure Assessment <ul style="list-style-type: none"> • Product types – sources for exposure calculations • Threshold of Toxicological Concern • Margin of Exposure, Margin of Safety 	J. Magby M.Tsang
Full Safety Assessment Combination and application of previous sessions to draft a complete assessment	C. Cheung
Field trip to Colgate-Palmolive's Global Technology Center to present the assigned safety assessments (Mid-Semester Evaluation)	Students to present their Safety Assessments
Occupational Health <ul style="list-style-type: none"> • Differences consumer vs occupational exposures. • Endpoints of concern • Personal Protective Equipment / Industrial Hygiene / Medical monitoring 	C. Harvey
Environmental Safety <ul style="list-style-type: none"> • Ecotoxicity: Build on previous sessions on Hazard Identification, Exposure Assessment, Dose Response • Predicted Exposure Concentration/Predicted No Effect Concentration • Environmental Fate <ul style="list-style-type: none"> ○ Influence on design for ecotoxicity testing ○ Testing and in silico (EpiSuite) 	K. Fried
Sustainability <ul style="list-style-type: none"> • Introduction to sustainability • Toxicologists' role in sustainability • Evaluation of chemical alternatives 	B. Wall
Issues Management <ul style="list-style-type: none"> • How to address questions from consumers and management • Roles of Environmental Occupational Health and Safety and Product Safety • Hazard/Risk communication • Public Relations 	J. Magby K. Fried