



FUNDAMENTALS OF HAIR SCIENCE & HAIR CLAIMS

Wed, 11th to Fri, 13th May 2022

An On-line Course. Available Live and On Playback.

An introductory course designed for graduate and post-graduate level cosmetic scientists who need to build their knowledge in hair science and claims substantiation.

Attendees should leave with an understanding of hair structure and biology, hair product science and the key measurement techniques used to test the performance of hair products and support hair claims.

This course will be given by TRI Princeton, a world-leading research institute focused on hair and skin testing for cosmetic applications.



COURSE AGENDA

eastern standard time



Wednesday, May 11th

An Introduction to Hair & Hair Products

AN OPEN TRAINING SESSION CHAIRED BY
DR TREFOR EVANS

8:45am – Introduction with Dr Trefor Evans

9am

HAIR STRUCTURE & PROPERTIES

Dr Trefor Evans

10am

FOLLICLE & SCALP BIOLOGY

Dr Marcella Gabarra

11am

HAIR TYPES & THEIR CLASSIFICATION

Dr Ernesta Malinauskyte

12pm

HAIR PRODUCT SCIENCE

Dr Paul Cornwell

1pm

Daily Quiz

Kahoot!

Download Kahoot! On Your Phone to Participate
With Your Name Or Anonymously

day one

ABSTRACTS

day one





9:00am

HAIR STRUCTURE & PROPERTIES

Dr. Trefor Evans

Institute Fellow, TRI Princeton

This lecture explores how the wondrously complex scientific structure of hair translates into everyday consumer language. While focusing on the structure and chemistry, it also introduces concepts that will be further explored in later lectures.

AFTER ATTENDING THIS PRESENTATION, YOU SHOULD BE ABLE TO:

- Describe the structure of hair and its chemical components
- Start to relate the structure of hair to its mechanical properties
 - Understand how water wets and plasticizes the hair



10:00am

FOLLICLE & SCALP BIOLOGY

Dr Marcella Gabarra

Post-Doctoral Fellow, TRI Princeton

Hair human follicle is a complex structure, also called a mini organ, placed in the scalp region and the target of a wide range of cosmetic products. This lecture will explore the hair follicle and hair scalp structure, the methods used to characterize these complex structures and evaluate the interactions with the cosmetic products.

AFTER ATTENDING THIS PRESENTATION, YOU SHOULD BE ABLE TO:

- Comprehend the structure of hair follicle and hair scalp
- Understand how cosmetic products act on these structures
- Understand the equipment and methods used for studying these regions



11:00am

HAIR TYPES & THEIR CLASSIFICATION

Dr Ernesta Malinauskyte

Director of Hair Research, TRI Princeton

The previous lectures in the course described hair structure and biology. However, looking around us, it is clear that a wide range of hair types exist. How do we describe and classify different hair types? And what does this mean for hair product design?

This presentation will discuss hair classification types: (i) Andre Walker Hair Typing System developed by Oprah Winfrey's stylist Andre Walker and widely adopted by textured hair consumers, (ii) scientific L'Oréal classification system, (iii) other less known attempts to classify human hair. You will also get to know common problems, testing methods to evaluate them, and potential solutions to tackle the problems experienced by consumers.



12:00pm

HAIR PRODUCT SCIENCE

Dr Paul Cornwell

Business Development Director, TRI Princeton

Liquid-based shampoo and conditioner products are the core of the hair care category, contributing, by far, the largest proportion of overall sales.

This presentation describes how surfactant technologies are used to construct these products, and how surfactants also work to deliver consumer benefits such as cleansing, foaming, and conditioning. It will also help those new to the category start to select the best surfactants for their shampoo and conditioner formulations.

AFTER ATTENDING THIS PRESENTATION, YOU SHOULD BE ABLE TO:

- Explain how surfactants control the rheological fingerprint of cleansing products
- Describe how surfactants deliver cleansing, foaming, mildness and polymer deposition
- Understand how to select surfactants for your shampoo product development needs
 - Explain how surfactants create lamellar phases in conditioners
- Understand how to select surfactants for your conditioner product development needs

1:00pm



TEST YOUR KNOWLEDGE

Download Kahoot! On Your Phone to Participate With Your Name Or Anonymously

Kahoot!

An Introduction to Hair & Hair Products

Thursday, May 12th

AN OPEN TRAINING SESSION CHAIRED BY
ELEANOR LEHMAN

PART I

8:45am – Introduction with Eleanor Lehman

9am

HAIR CONDITIONING TESTS

Dr Paul Cornwell

10am

HAIR STRENGTH TESTING

Dr Trefor Evans

11am

IMAGING ACTIVE PENETRATION INTO HAIR

Dr Samuel Gourion-Arsiquaud

12pm

HAIR STYLING AND TESTING OF STYLING PRODUCTS

Dr Trefor Evans

1pm

Daily Quiz

Kahoot!

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With Your Name Or Anonymously

day two

ABSTRACTS

day two





9:00am

HAIR CONDITIONING TESTS

Dr Paul Cornwell

Business Development Director, TRI Princeton

Hair conditioning is a benefit demanded of many hair care products and is needed at many different points during the washing and styling process. Conditioning is also central to most hair claims, including manageability, protection, repair, moisturization and strength. This presentation describes the science behind friction, wear and lubrication on hair fibers, reviews the measurement techniques available and provides a guide to the conditioning agents available to formulators.

AFTER ATTENDING THIS PRESENTATION, YOU SHOULD BE ABLE TO:

- Understand the surface asperities present on hair
- Describe the basic laws of friction and the different conditions in which friction can be measured on hair
 - Define all the different hair friction tests available and their pros and cons
 - Choose the right conditioning agents for your product development needs



10:00am

HAIR STRENGTH TESTING

Dr Trefor Evans

Institute Fellow, TRI Princeton

This lecture discusses hair's impressive mechanical properties. It covers the measurement of stiffness, tensile strength, the tendency for fiber breakage and how product "strengthening" claims are made.

AFTER ATTENDING THIS PRESENTATION, YOU SHOULD BE ABLE TO:

- Understand the principles and practice of classical tensile testing, and its widespread use in hair science
 - Describe the methods used for fatigue testing and their applications in the hair category
 - Understand repeated grooming test methods, and how they can be used to support strength claims
- Combine your understanding of all the strength techniques to understand how best to reduce hair breakage



11:00am

IMAGING ACTIVE PENETRATION INTO HAIR

Dr Samuel Gourion-Arsiquaud

Director of Skin and Bio-substrates Research, TRI Princeton

If you want to show that your actives deposit onto the hair surface or penetrate deeper into the fiber you may consider doing some active delivery studies.

TRI Princeton have experience in labelling hair actives and visualizing penetration using a fluorescence microscope. Fluorescence microscopy is ideal for actives that are difficult to visualize directly with spectroscopy imaging, such as peptides and proteins. FTIR Spectroscopy and Raman Spectroscopy enables us to visualize the distribution of a particular molecule or ingredient on the hair surface or in a hair cross-section. The key advantage of FTIR and Raman imaging is that is often possible to image active delivery without needing to chemically modify, or 'tag', the active. Formulations can be applied as supplied.



12:00pm

HAIR STYLING AND TESTING OF STYLING PRODUCTS

Dr Trefor Evans

Institute Fellow, TRI Princeton

This lecture discusses the activity of hair styling products. It reviews formulation routes and strategies while also discussing assessment procedures for both the product and the various commercially available styling polymers.

AFTER ATTENDING THIS PRESENTATION, YOU SHOULD BE ABLE TO:

- Describe how water controls style set in the hair
- Understand which polymers are most frequently used in styling products, and why
- Describe the measurement techniques used to characterise hair styling polymer performance
- Combine your understanding to understand how the physical properties of the styling polymers relate to hair array properties and to consumer perception

1:00pm



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Kahoot!

Friday, May 13th

An Introduction to Hair & Hair Products

AN OPEN TRAINING SESSION CHAIRED BY
DR ERNESTA MALINAUSKYTE

PART II

8:45am – Introduction with Dr Ernesta Malinauskyte

9am

HAIR DAMAGE TESTING

Dr Ernesta Malinauskyte

10am

HAIR APPEARANCE TESTING (SHINE/FRIZZ/MOTION)

Dr Trefor Evans

11am

CHEMICAL TREATMENTS & INTERNAL FIBRE ACTIVES: TESTING APPROACHES

Dr Paul Cornwell

12pm

UV & POLLUTION DAMAGE TESTING

Dr Ernesta Malinauskyte

1pm

End of Course Remarks

With Dr Trefor Evans

day three

ABSTRACTS

day three





9:00am

HAIR DAMAGE TESTING

Dr Ernesta Malinauskyte

Director of Hair Research, TRI Princeton

Throughout evolution, hair was built to reflect many functions, from protection from the environment to attracting a mate. In the modern world, hair is treated as a renewable (with some exceptions) accessory, so consumers treat and style their hair in many ways to make it more beautiful and fashionable. The methods for chemical, physical, and cosmetic hair alterations are constantly being modified to achieve less damage and new functions. As such adventures are not always successful, cosmetic scientists should always be ready to help minimize the effects of failed attempts, improve existing products and propose new ideas for hair damage prevention and repair.

The course will address hair damage testing methods used for fundamental science and claims substantiation. How can we get the best out of them, and why are some of them not used equally for both purposes?



10:00am

HAIR APPEARANCE TESTING

Dr Trefor Evans

Institute Fellow, TRI Princeton

This lecture discusses the tricky topic of assessing hair's visual properties. Specific areas of focus include shine, color, volume/body, frizz and movement.

AFTER ATTENDING THIS PRESENTATION, YOU SHOULD BE ABLE TO:

- Understand the scientific principles the underpinning hair shine
- Describe the methods used to measure hair shine, and to support shine claims
 - Understand the methods used to support frizz control claims
 - Understand the methods used to support color-fade prevention claims
 - Understand the methods used to support volume/body claims
- Describe the methods used to measure hair movement, and how they might be used to support claims



11:00am

CHEMICAL TREATMENTS & INTERNAL FIBRE ACTIVES: TESTING APPROACHES

Dr Paul Cornwell

Business Development Director, TRI Princeton

Consumers are seldom 100% happy with their hair. If it is straight, it needs to be curlier, if it is curly, it needs to be straighter. Consequently, the internal chemical modification of hair has always been of great interest to the hair category. More recently, consumers have also demanded that products re-bond and repair internal hair damage. This presentation gives a broad overview of hair re-shaping technologies, including perms, relaxers and formaldehyde treatments, and also the latest actives claimed to repair and strengthen the inside of the hair.

AFTER ATTENDING THIS PRESENTATION, YOU SHOULD BE ABLE TO:

- Describe the most well-established chemical treatments used to change hair shape
- Understand the tests that can be performed to characterize chemical treatments for re-shaping the hair
- Describe the various fibre actives used in the market, and how they might really work



12:00pm

UV & POLLUTION DAMAGE TESTING

Dr Ernesta Mailauskyte

Director of Hair Research, TRI Princeton

With the increasing concern of pollution in urban areas, there has been a market demand for anti-pollution hair care products. For instance, haircare manufacturers are introducing products to fight particulate matter pollution by prevention and treatment/cleansing.

This lecture will investigate the fundamental aspects of the main types of pollution damage including UV, blue light, ozone, particles and outline the practical methods to assess the effectiveness of preventative/repair treatments.

1:00pm

END OF COURSE REMARKS

With Dr Trefor Evans, TRI Princeton

COURSE SPEAKERS





Dr Trefor Evans

Institute Fellow, TRI Princeton

Dr. Trefor Evans has worked in the Hair Care industry for over 30 years. The first half of his career was spent as a scientist and manager in the product development labs of large consumer goods companies (Unilever, Helene Curtis). Since joining TRI in 2007 he has held the roles Director of Measurement Services and Director of Research and now has the title Institute Fellow.

Dr. Evans is highly active in the hair care industry through many working relationships with companies of every shape, size and background. He is a regular presenter at international hair conferences and has been an invited speaker at many technical meetings and symposia worldwide. Additionally, he has served as Chairman for the past five iterations of the International Conference on Applied Hair Science. He has published numerous articles in the scientific literature and trade magazines and is co-author and co-editor of the book "Practical Modern Hair Science". He writes a regular column on hair testing and hair science for Cosmetics and Toiletries magazine and serves on their Scientific Advisory Board.

Dr Evans possesses a Ph.D. in the area of physical analytical chemistry and has spent his career using instrumental testing approaches to support the development, launch and maintenance of many international cosmetics products and brands. Such approaches also continue to be at the heart of fundamental research programs that have resulted in seven patents and have thrice been awarded by the Society of Cosmetic Chemists.

He regularly teaches and facilitates training classes on the topics of hair science and hair product claims which have been held in the US, Europe and Asia. He also teaches a customizable 1-man, 1-day course that has been conducted on-site at numerous client companies. He guest-lectures on Hair Science and the Hair Care Industry for a variety of academic cosmetic programs and has instructed at various educational events organized by the Society of Cosmetic Chemists (SCC). He has previously served on the SCC's Education Committee and currently sits on their Committee on Scientific Affairs.

He is also an Adjunct Professor at the University of Cincinnati and is Editor-in-Chief for the Journal of Cosmetic Science.



Dr Paul Cornwell

Business Development Director, TRI Princeton

Paul's technical expertise is focused on product evaluation, instrumental measurement techniques and on formulation design, particularly in cosmetic skin and hair care products.

He has many years of industrial experience in claim support testing, innovation and product development at Unilever and PZ Cussons.

Paul qualified as a pharmacist in 1989 and gained a PhD in Pharmaceutical Technology in 1993. For his PhD Paul worked with Professor Brian Barry at Bradford University on topical drug delivery and skin penetration enhancers. For his postdoctoral research he continued to work in skin delivery with Dr Joke Bouwstra and Dr Harry Bodde at Leiden University.

Since then Paul has enjoyed a career in R&D in the cosmetics industry working at Unilever and PZ Cussons.

Over his career Paul has published many journal articles and presented at many scientific conferences. His work has been cited in over 800 publications. In industry, Paul has been involved in many successful product launches for major, international cosmetic brands such as Organics, Dove, Lux, Sunsilk, Carex, Original Source, Charles Worthington and Imperial Leather. He has contributed to several patent applications, at least four of which have gone to the full 'grant' stage.

Paul teaches cosmetic science as a visiting lecturer at Liverpool John Moores University and Sunderland University, and on the UK SCS On-Line Diploma Course. He is also a member of the Scientific Programme Committee at the UK, SCS.



Dr Marcella Gabarra

Post-Doctoral Fellow, TRI Princeton

Marcella qualified as a Pharmaceutical Biochemist in 2016, with a degree from University of São Paulo, Brazil. Last year she earned her PhD in Pharmaceutical Sciences at the same university, focusing on technologies for cosmetic products. Marcella has always been interested in cosmetic science and has worked on the development and clinical evaluation of hair and skin care products since she was an undergraduate student, which resulted in published articles and oral and poster presentations at several congresses.

Marcella got to know TRI when she visited us on a summer placement in 2016 and now works as a Post-Doctoral Fellow in the Hair Claims team.



Dr Ernesta Malinauskyte

Director of Hair Research, TRI Princeton

Dr. Ernesta Malinauskyte earned her PhD in Chemical Engineering at Kaunas University of Technology (Lithuania). She has ~10 years of academic and professional experience in food engineering and hair sciences.

Currently, at TRI Princeton in the role of Director of Hair Research, Ernesta is responsible for leading a team of results-driven researchers investigating all textures fiber interactions with hair care, chemical & physical treatments, environmental insults (UV, particles, and ozone), as well as developing new claims substantiation methods for all types of hair and devices. Ernesta with the team also work on expanding TRI research capabilities in the microbiome, hemp products use for textile & skincare areas.

Ernesta often pushes the boundaries to make things better at TRI. This includes modification and enrichment of the work environment so the true potentials of interns, technicians, junior and experienced scientists are enabled.

Ernesta is an active member of the research community via publishing and giving presentations on research and hair science topics in academic environment, industry, and hairdresser communities.



Dr Samuel Gourion-Arsiquaud

Director of Skin and Bio-substrates Research, TRI Princeton

Dr. Gourion-Arsiquaud is the molecular and structural analysis expert at TRI. He uses various spectroscopic and microscopic techniques for the characterization of biomaterials and the study of biological modifications associated with specific conditions like treatment, drug use, disease, age or environmental factors.

Dr. Gourion-Arsiquaud's expertise lies in multiple biophysical techniques with a special emphasis on vibrational spectroscopies (FTIR & Raman) for bio-material sciences. He has more than 10 years of research experience, including technique development, project design and coordination, as well as a successful track record of achievements. Over the years, Dr. Gourion-Arsiquaud extended the application of its biophysical techniques, to diverse biological tissues; Bone, teeth, nail, hair and skin.

Dr. Gourion-Arsiquaud received a doctorate in Biochemistry with a specialization in Biophysics from the University of the Mediterranean (France) in 2005. He began his career at the Hospital for Special Surgery (HSS)/Weill Cornell Medical College studying the mechanisms of biomineralization via analyses of the mineral and matrix properties in mineralized tissue (bone, teeth). After, as associate researcher, Dr. Gourion-Arsiquaud has been examining the structural and functional analysis of Lipid/Protein interactions involved in the host - defense mechanism at Rutgers University.

Since he joined TRI in 2011 Dr. Gourion-Arsiquaud developed innovative tests, research areas and product evaluations relevant to cosmetic sciences, material analysis and medical applications; from technology development to product design and performance evaluation on hair, nail and skin care products. He also developed several long-standing external collaboration with academic leaders at local universities (Cornell, HSS, Rutgers, Columbia, University of Pittsburg).

Dr. Gourion-Arsiquaud was promoted to Director Skin & BioSubstrates in May 2017 to reflect his developing stature as leader of this important growing Cosmetic Business within TRI.



THANK YOU FOR JOINING US

Please Forward Any Feedback on the Course to
events@triprinceton.org

