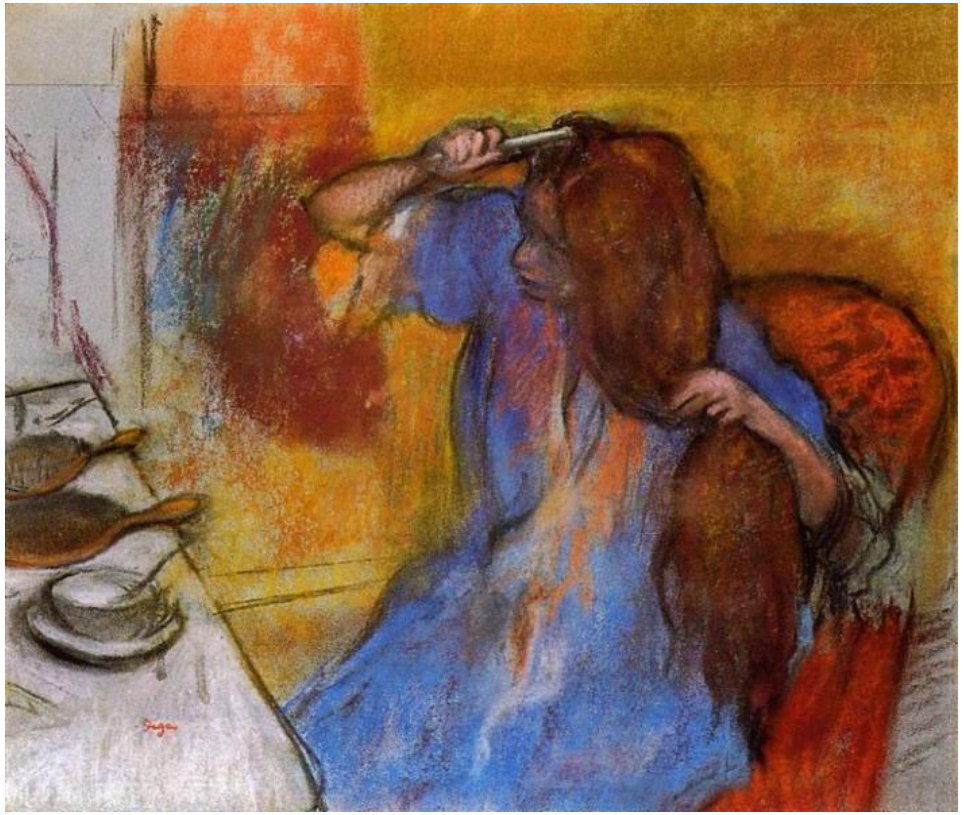
Hair and Scalp Care Testing and Claims

Paul Cornwell (TRI Princeton, USA)



Woman Brushing Her Hair, c.1889 - Edgar Degas

Essential needs in hair and scalp care: Timeless

Botticelli – The Birth of Venus, c.1484-1486

Healthy, abundant, youthful looking hair

Healthy scalp, free of dryness and irritation

The real ‘haircare gap’ is in unmet needs

Less broken hairs

Image from https://www.thatsister.com

Less hair Greying

Image from https://www.health.harvard.edu

…and many, many more!

Better curl definition

Image from https://lovebeautyandplanet.in

Less scalp dryness and itch

Image from https://blog.crownclinic.co.uk

Product testing is a key part of product development

Cosmetic scientists have a critical role in ensuring that…. ‘hair and scalp care products’…. are safe, efficacious and pleasing to use, and that claims made to consumers about these products are fully substantiated. Product evaluation is a fundamental part of delivering all these objectives.

De Castro, F., and Cornwell, P.A. (2024) **Introduction to Product Evaluation for Cosmetic & Personal Care Products** – Bite-Sized Learning (TRI Website) *814 views*

- *Uses of product evaluation*
- *Categories of product evaluation*
- *Regulations and guidelines*

Claims Substantiation: Follow the rules

Claim substantiation has….become an increasingly important responsibility for cosmetic scientists. It is now vital that product developers understand the guidelines, to minimize the risks of adverse rulings from regulators or litigation from disgruntled consumers.

Cornwell, P.A. and de Castro, F. (2024) **Planning and Designing Claims Substantiation Tests for Cosmetic and Personal Care Products – Bite-Sized Learning**– Bite-Sized Learning (TRI Website) *665 views*

- *Understanding the rules*
- *Building your claims matrix*
- *Designing your studies*

Types of hair and scalp testing

Sensory (Performance) Testing

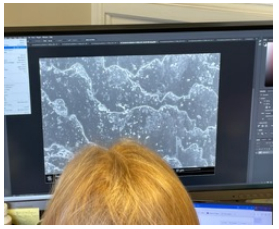
- Lab tress tests
- Half-head salon tests
- Expert sensory panels
- Home use tests (Huts)
- Others

Clinical Testing

- Hair growth/loss tests
- Dandruff tests
- Sensitive scalp tests
- Scalp greasiness tests
- Others

Instrumental Tress Testing

- Hair conditioning tests
- Hair appearance tests
- Hair styling tests
- Others



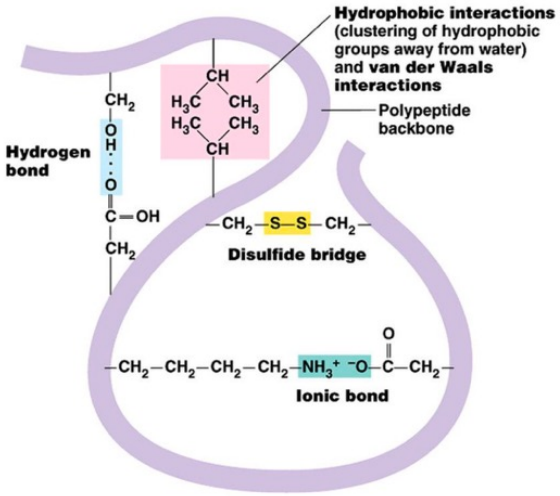
Instrumental fibre testing

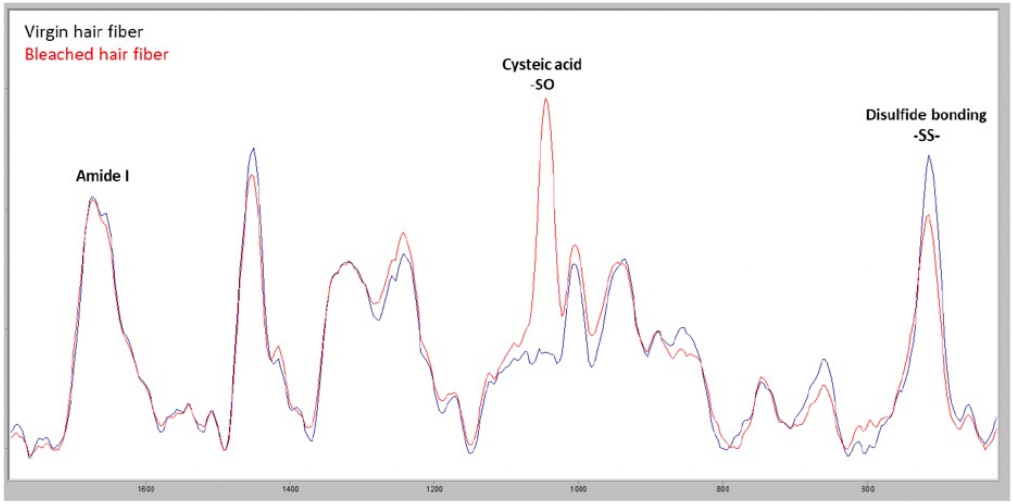
- Macro and micro-structure
- Mechanical properties
- Spectroscopy
- Chemical analysis
- Thermal properties
- Interactions with water
- Others

Active deposition and delivery testing

- Light/fluorescence microscopy
- FTIR/Raman imaging
- Mass spec. imaging
- Others

Hair Research at TRI – Hair Strength and Bond Builders

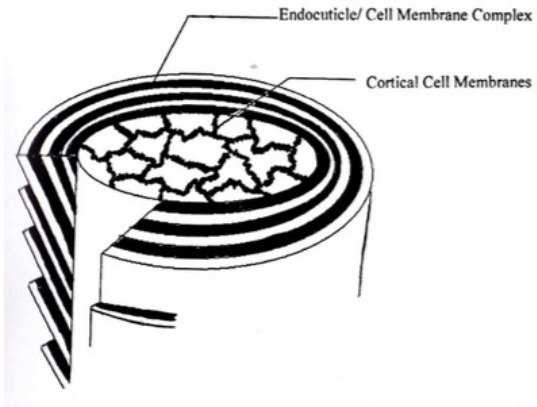




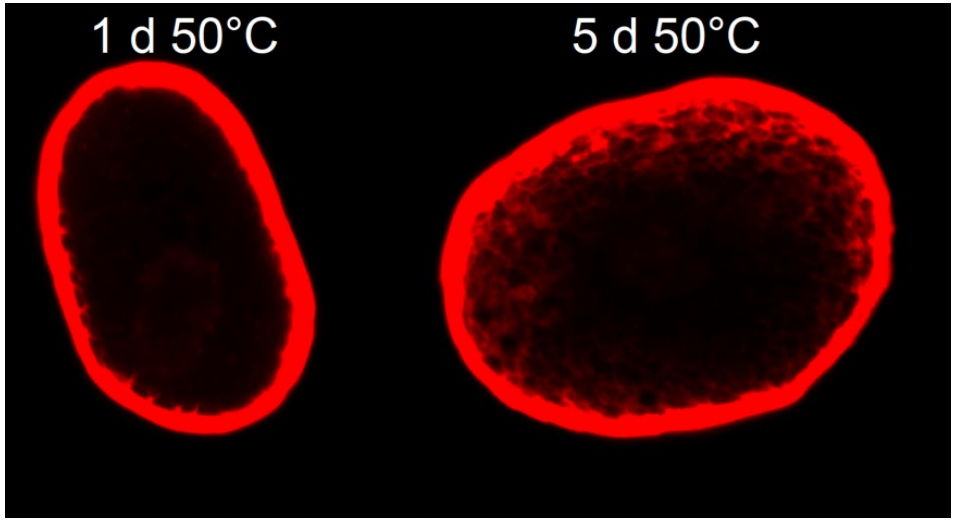
Use of FTIR and Raman spectroscopy to investigate the effects of treatments on hydrogen bonds and disulphide bonds, respectively[1,2]

1. *Gourion Arsiquaud, S. (2025) Confocal Raman Spectroscopy to support Bond repair claims substantiation. Oral presentation at SCC 7th Annual Meeting and Showcase, New York, December 15-17*
2. *Senak, L. (2026) Hair Resilience: Advanced Techniques to Evaluate Hair Bonding and Validate Cosmetic Claims. TRI Talks, Presented on-line on 14th January*

Hair Research at TRI – Lipid Damage and Replenishment



Schematic from; Robbins, C.R. Chemical and Physical Behaviour of Human Hair 4th Edition, Springer, New York, pp 47.

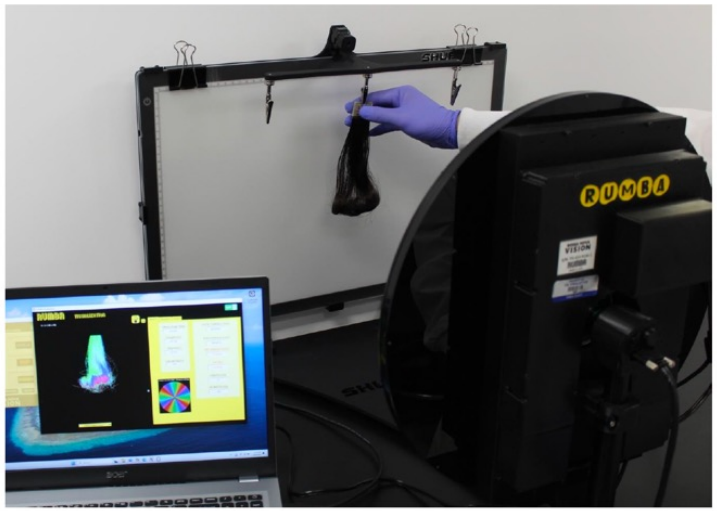


Imaging squalene penetration in undamaged hair

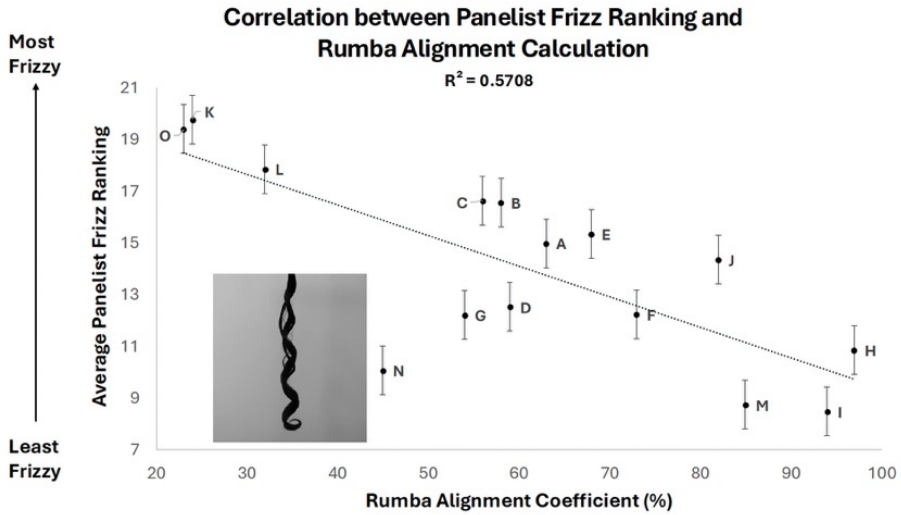
Use of HPTLC and fluorescence microscopy to investigate hair lipid replenishment and the effects of heat damage[1]

1. *Malinauskyte, E., Ganpule, S., Marrafa, P. (2025, 25 Jun). Understanding the Consequences of Heat Styling: The Penetration of Sebum-Mimicking Compounds. Presented at the 24th International Hair-Science Symposium, Hairs'25, Augsburg, Germany, 25-27 June.*

Hair Research at TRI – Translating consumer perception to instrumental measures



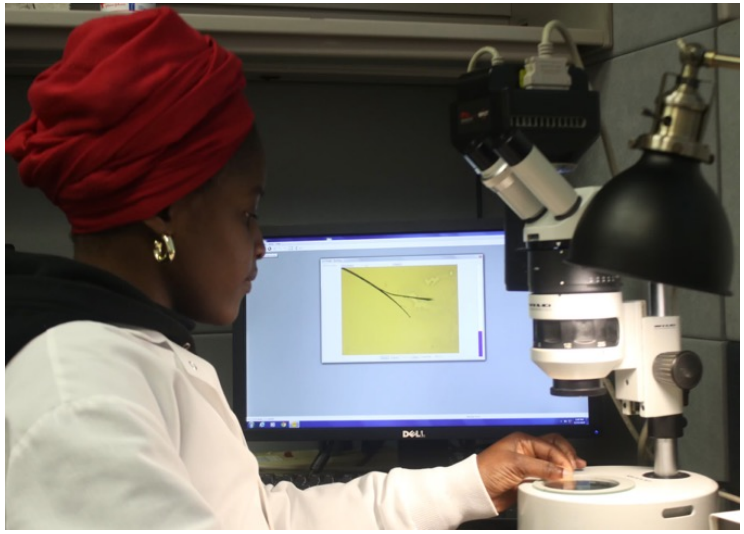
Rumba Optical Imaging System
by Bossa Nova Vision

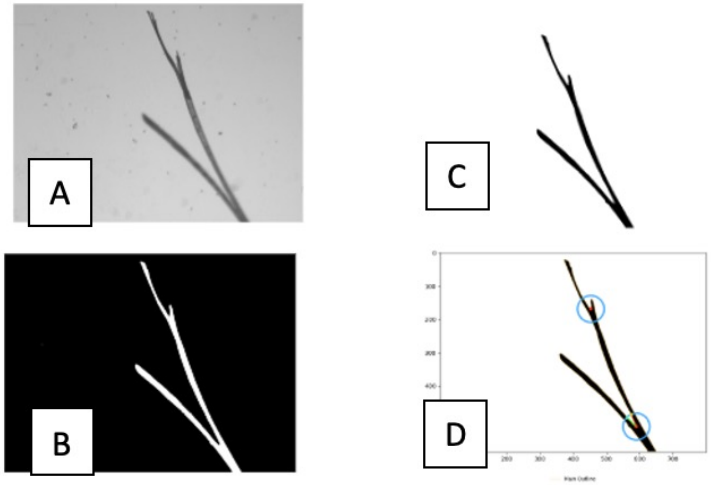


Use of global on-line panels to validate instrumental measurements of hair straightness and alignment[1]

1. *Mason, M., Davies, T., Ayton, S., Cornwell, P.A. (2025, 27 June) Bridging Consumer Perceptions and Technical Measurements: Assessing Hair Straightness and Alignment with Optical Imaging. Presented at the 24th International Hair-Science Symposium, HairS'25, Augsburg, Germany, 25-27 June, and SCS Annual Conference, London, July 2-3*

Hair Research at TRI – Automated Split Ends Analysis





Creation of Python based application that detects split ends and measures the angle of the splits. Eliminates manual grading[1]

1. *Esrafily, A.; Ashar, V. (2025, December 30). Automated Split End Closure Measurement (SPLITENDS IA 25.1). TRI Notes on Research 563, December 30 2025.*

Conclusions

- Consumer needs in hair care are timeless
- Product testing is key for optimizing product performance and supporting claims
- Hair and scalp care testing covers a very wide range of tests, some basic and some very advanced
- There is no gap in the quality of hair and scalp testing versus skin testing
- The real ‘hair care gap’ is in unmet consumer needs

2nd – 4th June 2026

Abstract deadline: 27th February!