

NEW TOOL TO ASSESS SEBUM REMOVAL AND CLEANSING EFFICIENCY OF DRY SHAMPOOS AND OTHER HAIR PRODUCTS ON HAIR AND SCALP

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INTRODUCTION

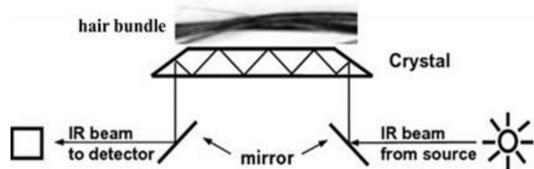
Dry shampoos and other hair products like cleansing conditioners are alternatives to standard shampoos for cleaning hair off dirt and sebum. Dry shampoo enable the consumers to clean their hair without the need for showering or to use standard shampoo products while cleansing conditioners are particularly attractive to women with very curly hair, as the products keep the hair detangled and moisturized. The sebum cleansing effects of standard shampoo are well known while the one associated to dry shampoos and cleansing conditioners are poorly understood.

In this poster, we used three different FTIR spectroscopic methods, to assess and compare the efficacy associated to different hair products especially dry shampoo products on hair fibers as well as on the scalp.

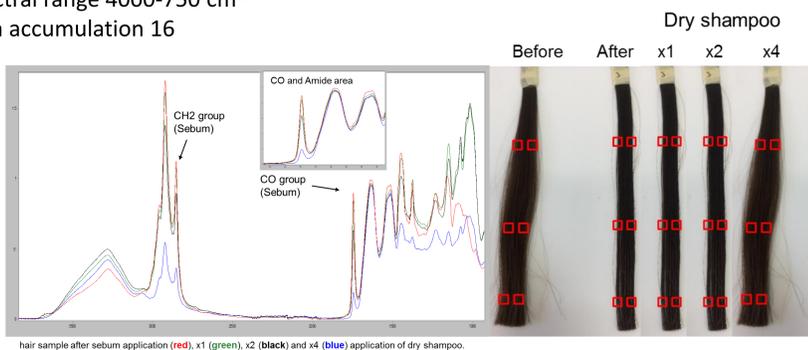
- ATR-FTIR spectroscopy was used to assess the sebum removal along hair fibers. We compared different types of hair products as well as different dry shampoo products.
- The ATR-FTIR imaging spectroscopy was used to visualize the deposition of particle from dry shampoos along hair fibers.
- In-vivo, ATR-FTIR spectroscopy was used on two subjects to assess natural sebum production and impact of dry shampoo on scalp.

Material and Method:

Spotlight 400 with Universal ATR accessory can probe the hair surface and assess the sebum amount along hair tresses. This method was used to evaluate and compare the efficiency of dry shampoo products to clean hair by removing sebum from hair fibers.

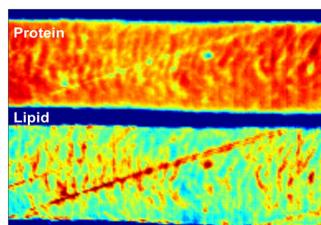


Spectroscopic parameters:
Resolution 4 cm⁻¹
Spectral range 4000-750 cm⁻¹
Scan accumulation 16



The Spotlight 400 with an ATR imaging accessory can image single hair fiber to visualize the sebum content or the deposition of particles along the hair fibers.

Spectroscopic parameters:
Resolution 4 cm⁻¹
Spectral range 4000-750 cm⁻¹
Scan accumulation 4
Spatial resolution 6.25 μm or 1.56 μm



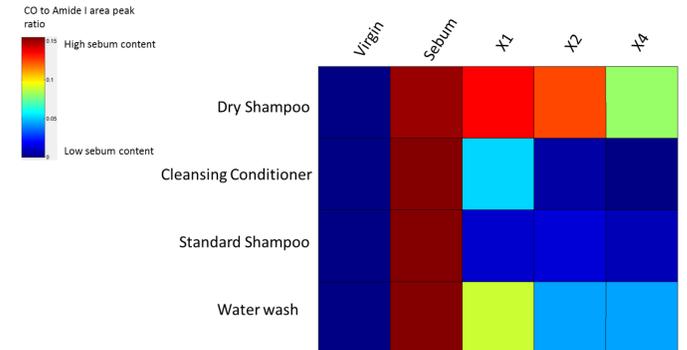
Portative FTIR Spectrometer with an optical probe developed by Remspec can analyze in-vivo any skin area (lips, scalp, face). In this project, this system was used to analyze the scalp surface from 2 subjects.

Spectroscopic parameters:
Resolution 4 cm⁻¹
Spectral range 4000-900 cm⁻¹
Scan accumulation 50

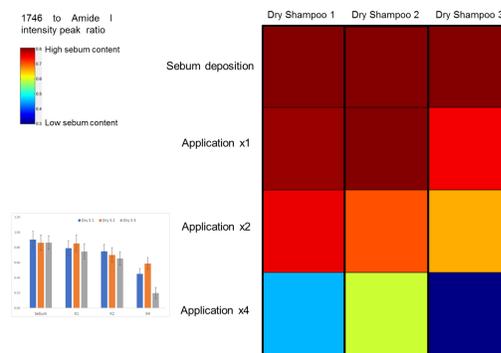


RESULTS

Sebum removal along hair fibers

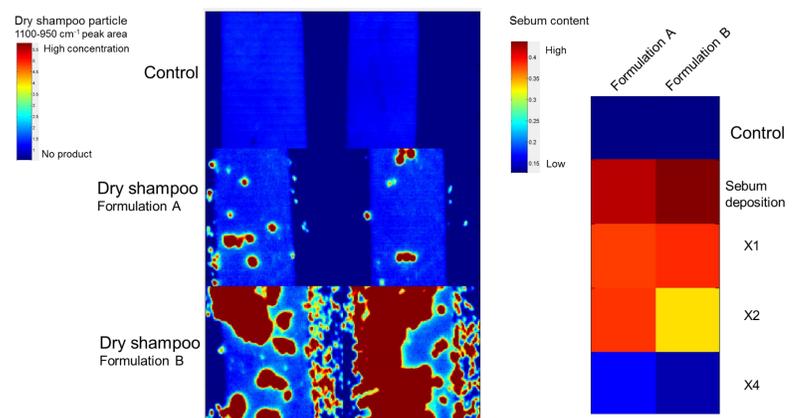


- Dry shampoos removed a significant amount of sebum over repeated uses but stay away of the performance of standard shampoo.
- Cleansing conditioners removed sebum roughly as well as standard shampoos.



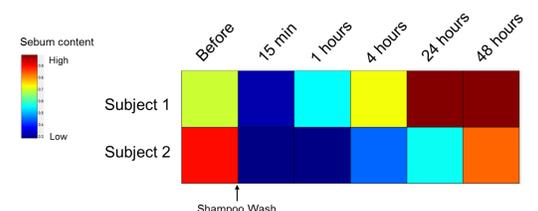
- It was possible to discriminate between 3 different dry shampoo products.
- The dry shampoo 3 is the most efficient to clean the sebum from the hair.

Dry shampoo deposition along hair fibers



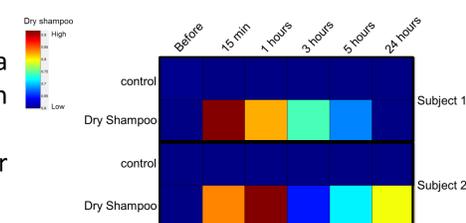
- A significant amount of particles from the dry shampoos were detected along the hair fibers.
- The deposition observed on the hair fibers was significantly higher with the dry shampoo B.

Scalp



- After washing the head with a regular shampoo all the sebum was removed from the scalp surface.
- Depending the subject, a significant amount of sebum was produced and detected on the scalp 4 hours after the washing step.

- After washing hair with a dry shampoo a significant amount of particle ended up on the surface of the scalp.
- These particles can remain on the scalp for up to 24 hours.



CONCLUSION

These three methods allow us to assess in-vitro and in-vivo the sebum level along hair fibers. From this, we can test and evaluate the efficacy of different dry shampoo products in terms of sebum removal. In addition, we can also use these methods to investigate the impact of dry shampoo or other hair products on the scalp.