hydration imaging

- Skin, scalp, hair, lips, ...
- Hairy skin, non-planar sites, ...
- Linear, calibrated response
- Filter to eliminate contact errors
- Filter to eliminate surface water errors
- In-vivo & in-vitro

hydration dynamics

- Burst capture up to 99 frames
- Video capture of any duration
- Hydration & barrier assessment
- Heterogeneity via StDev & RoI

skin topology

- Whole image & Region of Interest (RoI)
- Anisotropy Index calculation
- Corner Density analysis
- Intersection Density analysis

…and a whole lot more…
The Epsilon is a contact imaging system using a fingerprint sensor that responds to capacitance. It differs from similar devices such as the SkinChip (L’Oréal, France) and the MoistureMap (CK Technology sprl, Belgium) in its linear and calibrated response, where every pixel in the image provides a reproducible measurement that can be interpreted in terms of hydration.

The native response of such fingerprint sensors is non-linear and variable, as illustrated by the solid (typical) and dotted (sensor to sensor & pixel to pixel variations) grey lines in the graph. The Epsilon’s proprietary technology maps this response onto a linear scale for the full capacitance range from air to water. The instrument is calibrated using materials of known dielectric permittivity (dielectric constant \( \varepsilon \)), to ensure consistent measurements from instrument to instrument and from time to time, as illustrated by the red line in the graph.

The Epsilon can measure SC hydration with greater accuracy and flexibility than conventional single-sensor probes such as the Corneometer. Both the Epsilon and the Corneometer use the same capacitance measurement principle. Both the Epsilon and the Corneometer have ~20µm sensing depth that confines the measurement predominantly to the Stratum Corneum (SC). However, the Epsilon has 76800 sensors whereas the Corneometer has one. That’s a game-changer because skin is heterogeneous and skin-sensor contact is variable.

The Epsilon is licensed by L’Oréal for unrestricted use on skin, hair and mucous membranes.

software

- Live streaming up to 300 frames/minute
- Real-time mean-\( \varepsilon \), histogram & RoI
- Snapshot, burst & video capture
- Image enhancement via multi-frame averaging
- \( \varepsilon \) filtering to remove bad contact & surface water
- Heterogeneity analysis via StDev & RoI
- Skin topology characterisation
- Dual display of reference & analysis images
- Compatible with Windows 7/8/10
- Free updates

hardware

- Hardware for in-vivo & in-vitro measurements
- Capacitance measurement principle
- Calibrated for dielectric permittivity \( \varepsilon \)
- Spring-loaded sensor for consistent contact force
- 50µm image resolution, ~20µm depth resolution
- Sensing area 12.8 x 15mm
- Optional foot switch