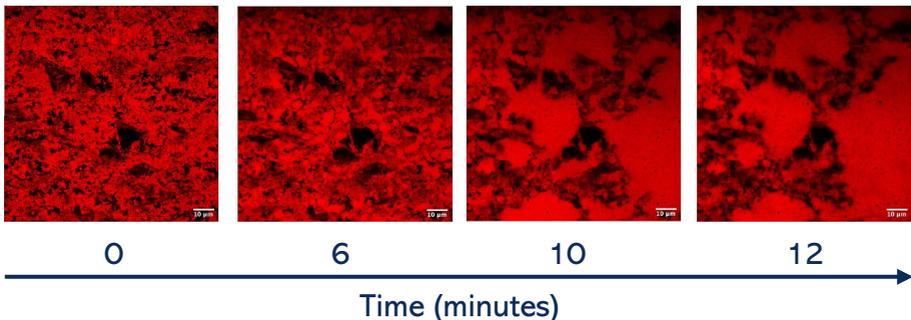


Advanced microscopy techniques for microstructural characterisation of formulations

Structural evolution over time as the formulation is applied

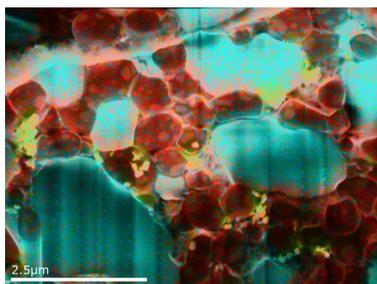
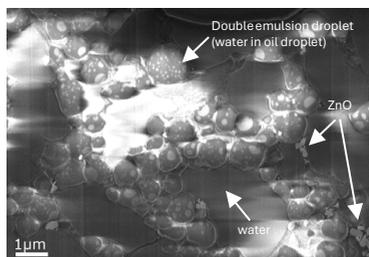
By using confocal laser scanning microscopy, we can observe how the structure of the formulation changes as it dries as a thin film. The images below show a commercial sunscreen formulation (dyed such as the red regions are oil) from $T=0$ on the left to $T=12$ on the right. The increased area of red regions with time suggests that the oil droplets coalesce with time and upon drying.



High resolution imaging of the microstructure and 3D information

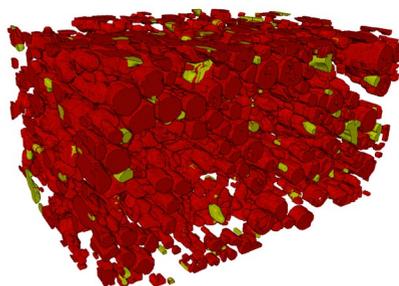
State-of-the-art cryo Focused Ion Beam Scanning Electron Microscopy (FIB SEM) enables us to image formulations up to nanometer resolution.

The facility allows us to observe how the components interact with each other and form the overall structure of the formulation.



Energy Dispersive X-Ray Spectroscopy enables us to identify elements. Thereby confirming the different components and their location in the structure. Here, blue is oxygen (water), red is carbon (oil) and yellow is zinc (ZnO).

Serial slice and sectioning of the sample enables 3D reconstruction of the formulation's structure. The ZnO in yellow and oil droplets in red. The whole system is surrounded by a continuous water phase which is not shown.



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