

## Medical > In Vivo > Other material

# 75

**Confocal laser scanning microscopy, optical coherence tomography and transonychial water loss for in vivo investigation of nails.**

*Sattler E, Kaestle R, Rothmund G, Welzel J.; Br J Dermatol. 2012 Apr;166(4):740-6. doi: 10.1111/j.1365-2133.2011.10730.x.*

### ABSTRACT

**BACKGROUND:** Nail disorders can be diagnostically challenging to the dermatologist. Noninvasive methods might help to avoid nail biopsies. More knowledge of the typical features of healthy nails with these techniques is needed for comparison with nail diseases.

**OBJECTIVES:** To describe the typical morphology of healthy nails in optical coherence tomography (OCT) and confocal laser scanning microscopy (CLSM) and to examine the influence of exposure to water on OCT features, nail thickness as well as on transonychial water loss (TOWL) before and after a hand bath.

**Material and methods:** In the first part healthy nail plates were investigated with OCT and CLSM. The thickness of layers as well as structural details were defined. Secondly, in a prospective study 30 healthy volunteers conducted 10 hand baths with water within a 2-week period. Measurements of nail thickness and signal intensity by OCT as well as of the TOWL were performed over time.

**RESULTS:** In OCT the unaffected nail plate appears as a band-like, layered structure, yet with some individual differences. In addition, CLSM is able to display single corneocytes and the integrity of their borders. Exposure to water led to a transient rise of TOWL and in nail thickness.

**CONCLUSIONS:** OCT, CLSM and TOWL offer valuable noninvasive diagnostic tools for the examination of nails. Using CLSM, microscopic features like integrity of single corneocytes can be investigated. OCT allows determination of nail plate thickness and both OCT and TOWL measurements are able to detect short-term effects after exposure to water.