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Wavelength effects on contrast observed with reflectance in vivo confocal laser scanning microscopy.

Luedtke MA, Papazoglou E, Neidrauer M, Kollias N.; Skin Res Technol. 2009 Nov;15(4):482-8 DOI:

ABSTRACT

BACKGROUND/PURPOSE: The ability to optically section live biological tissue in vivo with laser light is made possible by confocal laser scanning microscopy (CLSM). In this work, the effects of changing the wavelength of incident light used for CLSM imaging of human skin are reported and analyzed.

METHODS: Optical phantoms and the skin of eight human volunteers were imaged using CLSM systems having three different incident light wavelengths (405, 785, and 830 nm).

RESULTS: Qualitative and quantitative differences were observed between images obtained at each wavelength, despite the proximity of the two near infrared 785 and 830 nm wavelengths. Furthermore, the penetration depth achieved with the 405 nm CLSM permitted imaging into the papillary dermis.

CONCLUSION: The laser wavelength used in CLSM reflectance imaging is important to properly understand and resolve different biological structures within human skin.