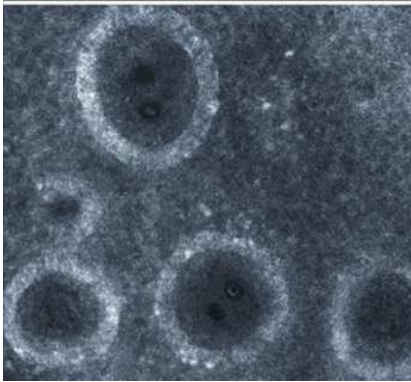


# IN VIVO REFLECTANCE CONFOCAL MICROSCOPY ASSESSMENTS OF DYNAMIC ALTERATIONS OF CUTANEOUS MICROCIRCULATION IN HUMANS ON MORPHOLOGICAL FEATURES

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**Objective:** Until now, high resolution reflectance confocal-laser-scanning microscopy (CLSM) was used for observation of cutaneous morphology in vivo and in real time (Fig.1). We hypothesized that CLSM also allows observation of dynamic processes of cutaneous microcirculation.



**Figure1:** Reflectance Confocal Microscopy image depicts the stratum papillare as a bright circular basal layer with the dark focus corresponding to the dermal papillae. The circles are surrounded by the spinous layer. Focusing on the dermal papillae, the lumina of capillary loops were visible as black holes.

**Methods:** Reflectance CLSM (Vivascope1500; Lucid Inc, Rochester New York; USA) was performed in 24 young male habitual smokers (23 years, range: 19 to 26, body mass index  $23.9 \pm 4.04$ ) with relatively limited cigarette exposure (mean:  $3.1 \pm 2.4$  packyears). Eight matched nonsmokers served as controls. The quantitative blood cell flow and the diameter of capillary loops were determined prior (baseline), during, as well as 5 and 10 minutes following smoking.

**Results:** Baseline value for blood cell flow was  $55.50 \pm 2.33$  cells/min, and decreased over 45% during smoking ( $30.43 \pm 3.76$ /min;  $P=0.02$ ). They were still 22% lower ( $43.33 \pm 2.45$ /min;  $P=0.01$ ) five minutes after smoking and exceeded baseline values ten minutes after smoking by 13% ( $63.00 \pm 3.10$ /min;  $P>0.05$ ). The baseline values for capillary loop diameter ( $9.03 \pm 0.22 \mu\text{m}$ ) decreased by 21% ( $7.18 \pm 0.28 \mu\text{m}$ ;  $P=0.03$ ) during smoking, remained about 9% ( $8.23 \pm 0.18 \mu\text{m}$ ;  $P=0.01$ ) lower five minutes after smoking and exceeded baseline values insignificantly by 4% ( $9.38 \pm 0.28 \mu\text{m}$ ;  $P>0.05$ ) ten minutes after smoking. There were no significant differences to the controls.

**Conclusion:** Reflectance CLSM enables qualitative and quantitative observation of dynamic processes of cutaneous microcirculation on histomorphological level