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### Reflectance confocal-laser-scanning microscopy in vivo assessments of cigarette-induced dynamic alterations of cutaneous microcirculation on histomorphological level.

Altintas MA, Altintas AA, Guggenheim M, Gohritz A, Meyer-Marcotty M, Vogt PM.; *Microsc Res Tech.* 2009 Apr;72(4) DOI: 10.1002/jemt.20661. 2009: 347-50, 2009

#### ABSTRACT

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

**METHODS:** Reflectance CLSM (Vivascope1500; Lucid, Rochester, NY) was performed in 24 young male habitual smokers (23 years, range: 19-26, body mass index 23.9 +/- 4.04) with relatively limited cigarette exposure (mean: 3.1 +/- 2.4 pack-years). 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 min after smoking.

**RESULTS:** Baseline value for blood cell flow was 55.50 +/- 2.33 cells/min, and decreased over 45% during smoking (30.43 +/- 3.76/min; P = 0.02). They were still 22% lower (43.33 +/- 2.45/min; P = 0.01) 5 min after smoking and exceeded baseline values 10 min after smoking by 13% (63.00 +/- 3.10/min; P > 0.05). The baseline values for capillary loop diameter (9.03 +/- 0.22 microm) decreased by 21% (7.18 +/- 0.28 microm; P = 0.03) during smoking, remained about 9% (8.23 +/- 0.18 microm; P = 0.01) lower 5 min after smoking and exceeded baseline values insignificantly by 4% (9.38 +/- 0.28 microm; P > 0.05) 10 min 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.