STUDIES ON THE EFFECT OF VARIOUS *PROPIONIBACTERIUM ACNE*S STRAINS ON THE CELLULAR FUNCTIONS OF HPV-KER CELLS

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Introduction: Acne vulgaris is the most common multifactorial inflammatory skin disease of the pilosebaceous unit. The *Propionibacterium acnes (P. acnes)* bacterium has been shown to affect the cellular properties of skin cells, and plays a role in acne lesion formation, even though it is also a common member of the skin's commensal bacterial flora.
Methods: In order to investigate this phenomenon in more detail, we monitored the effect of three *P. acnes* strains (*889, 6609, ATCC 11828*) belonging to various phylogenetic groups within the species applied in different doses (multiplicity of infection, MOI= 25, 50, 100, 200, 300) on the proliferation and viability of HPV-KER cells using cell biological and molecular methods.
Results: First we monitored the cellular changes using a real-time impedance measurement-based technology. We found that only the *P. acnes 889* strain applied in high doses induced increased cell index (CI) values compared to the untreated control cells at 24-36 hours post-treatment. At later time-points (36-72 h post-treatment), however, the CIs showed a rapid decrease in the *P. acnes 889* and *ATCC 11828* treated cells, when applied in high doses (MOI=200, 300). The *P. acnes 6609* strain had no measurable effect in any applied conditions during the time course of the experiment. The observed changes were the result of the differential effect of various *P. acnes* strains on the proliferation and viability of HPV-KER cells, proved the cell number and morphological changes using Bürker-chamber and fluorescent microscopic analysis.
We also started to analyze the strain and dose specific signaling differences induced in HPV-KER cells using a real-time RT-PCR method. We found that the mRNA expression of key pro-inflammatory cytokines (TNFα, IL-1α) increased parallel to the elevating *P. acnes* doses at 6 hours after the bacterial treatment. This appeared to be the result of the dose dependent increase we detected in the nuclear translocation and the parallel activation of the NF-κB transcription factor, shown by Western blotting.

Conclusions: These results suggest that assorted *P. acnes* strains have different effects on the proliferation and viability of keratinocytes. These strain specific differences can be important in the determination of the severity of individual acne symptoms.