

***In Vivo* Skin Test by Using a Portable Cold Atmospheric Plasma Device**

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Cold atmospheric plasma (CAP) is regarded as a promising new technology for medical and hygiene applications [1][2]. Although worldwide groups have published extensive *ex vivo* and *in vitro* test results to address the biomedical efficacy of CAPs for different microorganisms, industrialization of this technology suffers extremely from the lack of *in vivo* data. In this contribution, we will present our recent *in vivo* test result on human skin by using a portable CAP device.

The portable device integrates a power supply unit and a plasma electrode into a cylindrical tube which has an outside diameter about 4 cm and a length about 15 cm. Plasma is produced by the surface micro-discharge principle and the high voltage pulsed signal for plasma generation is converted from DC output of rechargeable batteries by using a transformer and the supporting electronics.

The plasma treatments on the human skin were applied in two different ways: direct and indirect. For the direct treatment, the target skin touched the plasma electrode so that interaction between the skin and the plasma electrode may play an important role for alternating the plasma generation. For the indirect treatment, the skin was kept with approximately 1 cm away from the plasma electrode, therefore it did not affect the plasma production and reactive plasma species reached the skin mainly by diffusion. The bacterial flora of the human skin was sampled by the scrub-wash method using Teflon rings with inside diameter of 1.9 cm and Teflon sticks [3].

The result showed approximately 90% reduction of the bacterial load within 30 seconds plasma by the way of the direct treatment. The indirect treatment showed, however, lower reduction rate. The result is helpful to understand the plasma-skin interactions and can give advice to possible clinical studies of wound healing [3] and skin diseases [4] by using this portable CAP device.

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References

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