



Extract from the annual report 2016
To the website: www.ist.fraunhofer.de/en.html

THE NEXT GENERATION OF PLASMA TREATMENT

Wound dressings are standard in modern wound care. Their functions include the absorption of blood and wound exudates as well as protection against the ingress of bacteria and against mechanical stimuli. Plasma technology will be integrated into the next generation of modern wound dressings in order to combat micro-organisms and actively support wound healing. PlasmaDerm®, the world's first medical device in the field of plasma medicine, has been developed by CINOXY GmbH with the participation of the Fraunhofer IST.

“Cold” plasma technology and current medical technology solutions

The results from international research into the use of so-called “cold” and thus tissue-compatible plasma technology for human-medical therapies confirm a broad range of potential applications for this innovative approach. Its proven effects include antimicrobial action, pH modulation of the wound environment, stimulation of cell division and movement in human cells as well as improvement of the microcirculation, in other words, blood flow.

Currently, all of the products available on the market in this field are intended for use as stand-alone procedures and thus in the case of wound care are only applicable as a supplementary treatment when dressings are changed and also involve additional time expenditure on the part of both patient and staff.

The new solution: plasma technology integrated into the wound dressing

In the “KonChaWu” R&D project which started in 2016 the Fraunhofer IST and CINOXY GmbH are working together on the next generation of device systems. The project objective is to merge the concepts of “cold” plasma technology and wound dressings – in other words, the plasma-based dressing should be able to remain on the wound surface for up to several days beneath a bandage. Depending on the therapy modality, the air plasma can be generated for the desired period of time, typically 90 s, without a change of bandage, using an external plug-in connector routed through the bandage. If necessary, the treatment can be repeated several times a day.

From the beginning of the project, test samples made of different polymers and with application-specific geometries were prepared and tested under different electrical operating parameters. In this phase of the project the stable generation of the air plasma was in the foreground.

Outlook

In the future, safety-related process parameters, such as UV and gas species emissions, leakage current and temperature development, are to be determined so as to be able to define safe operating conditions. The project partners expect that their development work will improve the ability of the technology to integrate into medical and nursing procedures and thereby to boost acceptance sustainably.

The project

The project is funded with more than €700,000 by the State of Lower Saxony and the European Fund for Regional Development (EFRE).

1 *Olaf Lies, Minister for Economic Affairs, hands over the grant notification.*

2 *The electrical signal characteristics are developed with computer support.*

CONTACT

Dr. Andreas Helmke

Phone +49 551 3705-360

andreas.helmke@ist.fraunhofer.de