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## **Not just repairing, but curing: plastic surgery congress showcases revolutionary new approaches to treatment of burn and accident victims**

**Plastic surgery is a wide-ranging discipline, covering fields such as reconstructive surgery, hand and burn surgery, as well as aesthetic surgery. Especially when it comes to treating people who have suffered burns or been involved in an accident, the focus is on regenerative technologies that promote healing instead of simply fixing damage. And Austria is playing a leading role in the development of dressing materials that support the body's healing process. At the World Congress of the International Society of Aesthetic Plastic Surgery (ISAPS), which is taking place at the Austria Center Vienna from 11-13 September, specialists in the Austrian capital will share the latest breakthroughs in regenerative medicine with colleagues around the world.**

“There's much more to plastic surgery than just cosmetic procedures. We provide care to a range of different people in a broad spectrum of specialisms – from reconstructive, hand and burn surgery through to aesthetic procedures. At MedUni Graz alone, we perform more than 2,700 operations in these fields every year. We put an emphasis on restoring form and function – quite simply the two are inextricably linked,” explains Prof. Lars-Peter Kamolz, head of the Division of Plastic, Aesthetic and Reconstructive Surgery at the Medical University of Graz, and an Austrian speaker at the World Congress of the International Society of Aesthetic Plastic Surgery (ISAPS).

### **Regenerative medicine – focus on curing, not repairing**

In Prof. Kamolz's view, regenerative technologies – which alongside digitalisation and robotics are delivering most of the quantum leaps currently being seen in the field of medicine – are undoubtedly the way forward in plastic surgery. “With regenerative medicine, the aim is not just to repair damage, but to provide cures. That might seem very esoteric at first glance, but it's essential if we want to gain a better understanding of fundamental processes in the human body and influence them using targeted approaches,” Kamolz stresses. “In our role as plastic surgeons, we are focusing primarily on tissue engineering, as well as induced autoregeneration, which centres on methods used to support the body's healing processes. These include specially designed active agents, and also matrices and cells. They play a particularly important role in the treatment of burns and other injuries, such as those resulting from serious accidents,” Kamolz adds.

### **Induction of autophagy and other core cellular processes as future strategies in the treatment of burn victims**

After taking urgent, life-saving action to treat patients who have suffered burns, the goal is to minimise the cell damage caused by the burns and induce the healing of wounds. The first step involves external stimulation of autophagy – this natural process of recycling damaged cell components in order to form new material takes place inside body cells. In addition, substances such as spermidine, which occurs in wheat germ, and resveratrol, which is found

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in red wine, can be applied in the form of special wound dressings or administered as a food supplement. “Researchers and developers from Austria are leading the way internationally in the development of these new materials for dressings and more broadly in regenerative medicine, especially in the field of induced autoregeneration,” Kamolz points out.

### **Tissue engineering – the key to successful formation of new skin**

The more extensive the burn injuries, the greater the likelihood that conservative – in other words, non-operative – treatment methods will be supplemented by surgical procedures that involve the use of skin-replacement techniques. In such cases, physicians use skin and skin-replacement materials. Biological replacement materials like pig and fish skin are placed on the surface of the wound, supporting the body’s healing process and inducing autoregeneration. This enables the body to form a new epidermis (the top layer of the skin) underneath this covering. “In this area, we’re also up there with the best of them,” says Lars-Peter Kamolz. Another, even more revolutionary approach is tissue construction. As a first step, cells are collected from the donor organism – ideally the patient themselves – after which a skin graft is cultivated in a laboratory and then transplanted (or, in effect, retransplanted) onto the recipient. “A key advantage here is that these lab-grown cells remain in the body and support the regeneration not only of the epidermis, but also the dermis below. This significantly speeds up the wound healing process and the body forms fewer scars,” Kamolz explains.

### **Personalised timing: from scar maturation to tissue engineering**

As people who suffer burns are also affected by aesthetic disfigurements of parts of the body that are frequently visible, as well as functional impairments, doctors take steps to counter these problems at an early stage in the treatment process. In line with the principles of personalised medicine, the timing of these interventions depends on the patient concerned. The degree of functional impairment is a vital consideration, as this determines whether plastic surgery takes place immediately or after wounds have healed. “In principle, it’s better if scars can mature. That can take a full year after a patient suffers burns. Then, the necessary corrective procedures can be carried out. But if, for instance, the burns affect a part of the body that is used a lot, and without which the patient would suffer very significant physical impairment, plastic surgery will be carried out earlier on in the process,” says Prof. Kamolz.

### **About IAKW-AG**

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