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Swiss researchers develop novel bandage for healing

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Researchers from Empa teamed up with ETH Zurich, Centre Suisse d'Electronique et de Microtechnique (CSEM) and University Hospital Zurich to develop a high-tech system that is supposed to supply the nursing staff with relevant data about the condition of a wound.





A novel bandage alerts the nursing staff as soon as a wound starts healing badly. Sensors incorporated into the base material glow with a different intensity if the wound's pH level changes. This way even chronic wounds could be monitored at home.

The idea of being able to see through a wound dressing gave rise to the project Flusitex (Fluorescence sensing integrated into medical textiles), which is being funded by the Swiss initiative Nano-Tera. Researchers from Empa teamed up with ETH Zurich, Centre Suisse d'Electronique et de Microtechnique (CSEM) and University Hospital Zurich to develop a high-tech system that is supposed to supply the nursing staff with relevant data about the condition of a wound.

When wounds heal, the body produces specific substances in a complex sequence of biochemical processes, which leads to a significant variation in a number of metabolic parameters.

With this in mind, Empa teamed up with project partner CSEM to develop a portable, cheap and easy-to-use device for measuring fluorescence that is capable of monitoring several parameters at once. It should enable nursing staff to keep tabs on the pH as well as on glucose and oxygen levels while the wound heals. If these change, conclusions about other key biochemical processes involved in wound healing can be drawn.

If certain substances appear in the wound fluid, customized fluorescent sensor molecules respond with a physical signal. They start glowing and some even change color in the visible or ultra-violet (UV) range. Thanks to a color scale, weaker and stronger changes in color can be detected and the quantity of the emitted substance be deduced.