

Graphene bandages as a wound-healing platform for smart bandages

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Chronic wounds are serious health issues that are currently becoming a major human and economic burden due to the steady increase of the population of diabetics and bed-ridden elderly. Chronic wounds indeed lead to nearly 500,000 amputations each year worldwide and are globally generating direct and indirect costs (stays in hospital) totaling 35 billion € globally. Therefore, there is an urgent need for novel therapies to trigger and speed-up wound healing at early stages. It happens that monolayer graphene film with its bio stimulating effect (1) is providing a very promising technology to unlock these challenges. For that purpose, we are currently assessing in the lab its ability for a better induce cells regrowth and promote tissue engineering.

On the application side, we are developing a technology platform that exploits the features of graphene to improve the management of woundcare. We are taking advantage of the combined biostimulating, transparent and electrically conducting properties of graphene to generate an interface useful for tissue engineering. I will present also the perspective both academic and industrial developments of a novel technology involving monolayer of graphene on polymers.

Our bandage platform (2) is based on the integration of a monolayer graphene polycrystalline layer back-bonded onto a biocompatible polymer layer. The resulting film can directly be applied onto the bed-wound and is inserted in a commercial bandage. Graphene surface combines healing (speed-up of wound closure) and

antibacterial action, optical transparency and electrical conductivity. The specific properties of graphene make it a substrate useful for providing wound dressing enabling a novel wound healing technology involving electrostimulation and detection .

I will present the latest advances of our technology and the perspectives for rapid market access.

References

- [1] F. Veliev et al. *Biomater.* 86, 33-41, (2016)
- [2] www.graph heal.com

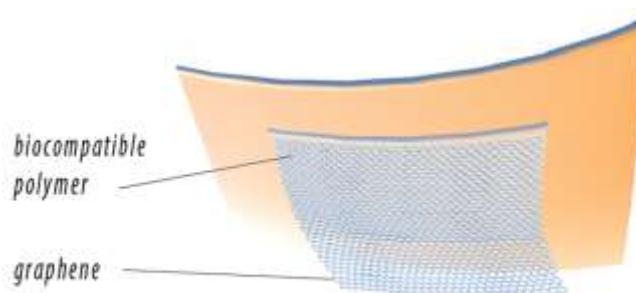


Figure 1: Principle of the graphene-coated bandage platform : a single monolayer of polycrystalline , CVD Graphene is assembled onto a biocompatible polymer and integrated in a bandage.
