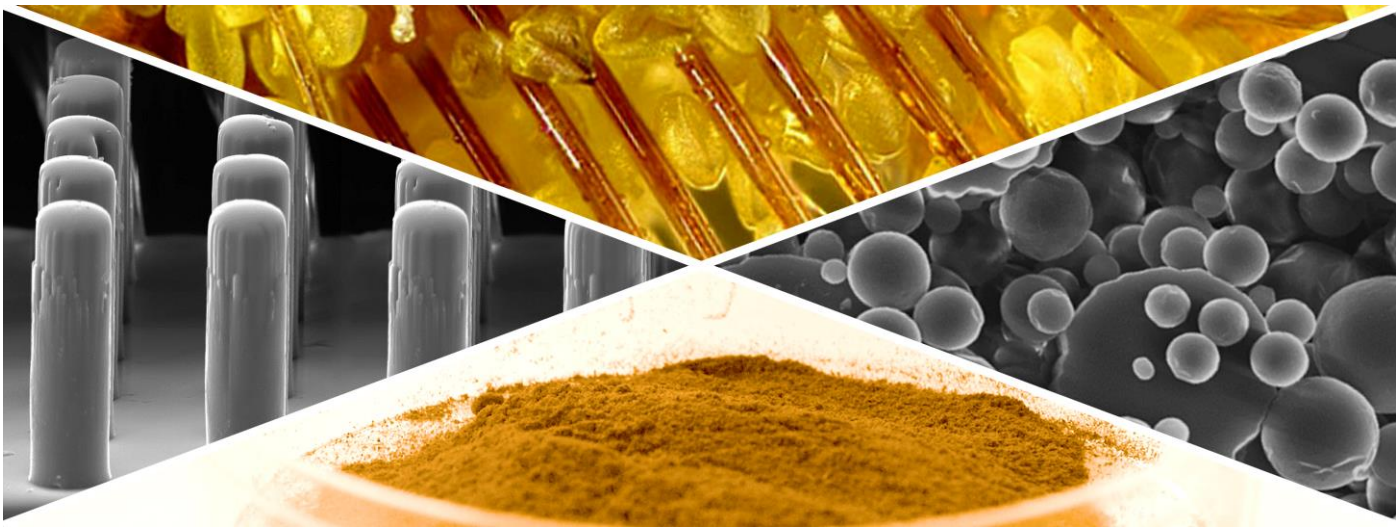
PATTERNED SURFACES FOR PHYSICAL ENTRAPMENT OF DRUG PARTICLES



TECHNOLOGY SUMMARY

Easy-to-apply device composed of a transdermal patch with microsize patterns such as micropillars, able to efficiently entrap the maximum amount of drug particles at the micro scale and release them in a controlled and sustained manner.

The maximum amount of entrapped drug microparticles is enabled by the similarity between the micropillars spacing in the patch and the microparticles diameter, enhancing the dose of the therapeutic compound administrated, decreasing the need of frequently replacing the patch.

BENEFITS

HIGHER DRUG ENTRAPMENT: the proposed device is able to effectively entrap 5 times more drug content than commercially available patches, allowing:

- LOWER NEED FOR PATCH REPLACEMENT
- FACILITATED PROLONGED TREATMENTS

SIMPLE, FAST AND LOW COST FABRICATION PROCESS

EASY-TO-USE: the particles are entrapped in the device by simple manual pressing the patch against dry drug particles, allowing its correct application by any user.

CONTEXT

Transdermal drug delivery patches for cutaneous wounds treatment induce a faster healing of the wound, by delivering therapeutic agents that are included over or inside the patch. Commercially available patches can carry limited amount of drugs, which are already incorporated within the patch, not allowing for a personalized formulation.

The innovative aspect of the present technology, inspired by the high ability of honeybees to transport large quantities of pollen grains, relates to the development a transdermal patch with microsize patterns such as micropillars, able to efficiently entrap the maximum amount of drug particles at the micro scale and release them in a controlled and sustained manner. Such achievement increases the therapeutic dose applied, decreasing the need of constant replacing of the patch, allowing a personalized formulation.

APPLICATIONS

The present surfaces can be used for treatment of:
CUTANEOUS WOUNDS

Other applications that require physical immobilization of solid particulate objects are also possible:
BIOMEDICINE
AGRICULTURE
BIOTECHNOLOGY / CHEMICAL INDUSTRY
CLEANING UTENSILS

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IP RIGHTS

Provisional patent application filed in Portugal (priority date: 27-07-2018).

DEVELOPMENT STAGE

TRL 3: The devices (patch + drug particles) were successfully produced at a laboratory scale. Their effectiveness in the entrapment of drug microparticles was demonstrated, and drug release assays and antibacterial tests were performed achieving satisfactory outcomes, acting against gram-positive and gram-negative bacteria.

Natural origin polymers are also being exploited for the fabrication of the patches.

KEYWORDS

PARTICLE ENTRAPMENT

PHYSICAL IMMOBILIZATION

MICROPADRONIZATION

TRANSDERMAL PATCHES

MICROSCALE

PERSONALIZED FORMULATION

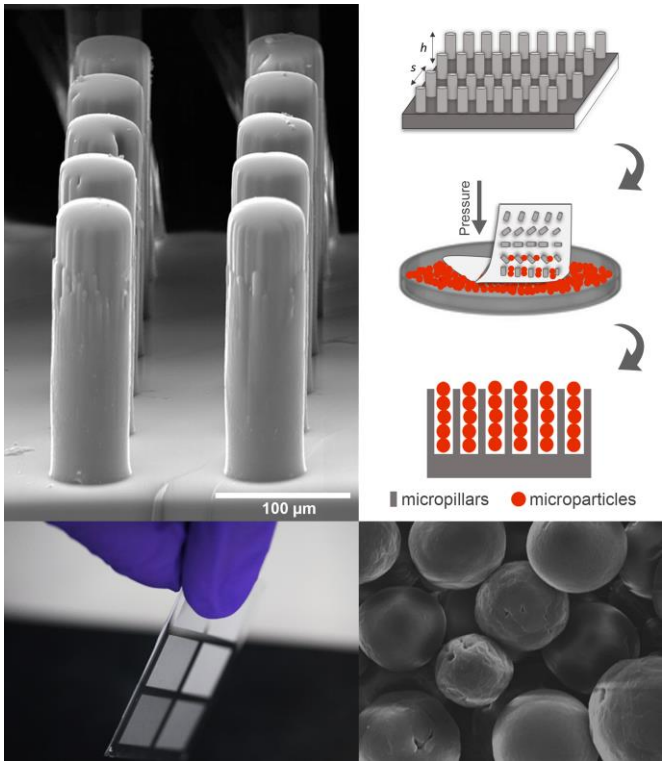
CUTANEOUS WOUNDS

CONTACT

Universidade de Aveiro
UATEC – Unidade de Transferência de Tecnologia
Edifício do Departamento de Educação e Psicologia
Campus Universitário de Santiago
3810-193 Aveiro | Portugal

tel: +351 234 370 887
e-mail: uatec@ua.pt
web: www.ua.pt/uatec

Technology #CI18001



DEVELOPED BY

Researchers from Aveiro Institute of Materials (CICECO) from the University of Aveiro.

BUSINESS OPPORTUNITY

Licensing agreement.

Joint further development.

Testing of new applications.

PARTNERSHIP

The University of Aveiro seeks research and/or industrial partners with pharmaceutical, chemical and biotechnological areas.

TRL: Technology Readiness Level – more information in https://ec.europa.eu/research/participants/portal/desktop/en/support/faqs/faq-2890.html