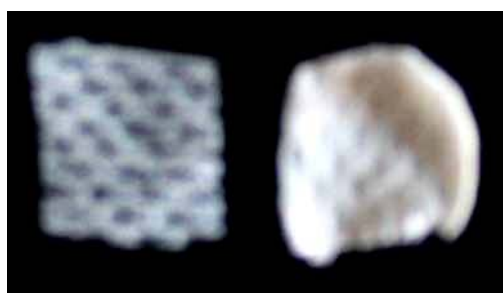


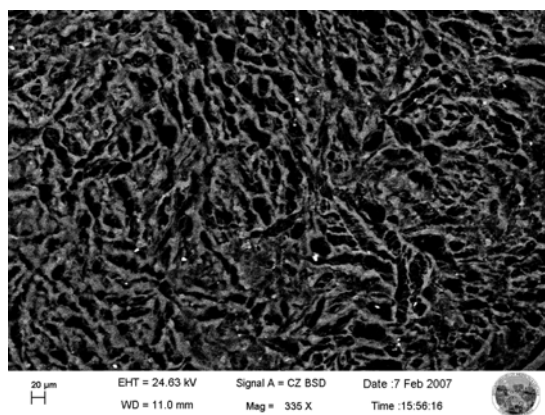
## Interactive patches for dermatological diseases

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The product is a drug delivery system made of a hydrogel/liposome suspension absorbed on solid support. It allows a prolonged release of drugs at the specific site, by efficient intracellular delivery of drug loaded liposomes. It is efficient also for the delivery and modified release of protein drugs. It is of simple topic application on epithelial ulcers and it can be used on human beings, and mammals, to treat dermatological diseases.



**Photograph of: left, gauze support; right, liposome/hydrogel interactive medication**



### 1. Description of the product

The drug delivery system here proposed is an interactive medical device for topical application either on intact or ulcerated skin, for the treatment of dermatological diseases. It is made by a solid support of gauze, a bioadhesive polymer (e.g. chitosan, carboxymethylcellulose) hydrogel, liposomes loaded with a drug, even a protein drug. The liposome suspension in the polymeric hydrogel is absorbed to the gauze to make the solid drug delivery system. The liposome/hydrogel suspension permits site specific and prolonged drug delivery, by efficient intracellular delivery of the drug loaded liposomes. The liposomes act as drug depot meanwhile keeping drug activity.

### 2. Innovative aspect of the product

The treatment of ulcers and sores needs to eliminate the necrotic tissue, to absorb exudates and to maintain a wet environment in order to improve cicatrization. Several commercial products are on the market (DuoDERM®, Aquacel®, Allevyn®), they act passively by absorbing exudates or actively wetting the sores, however none of these products neither contains liposomes nor protein drugs. The commercial products are gels, or gauzes containing the active components and with adhesive frame.

The innovative aspect of this interactive medical device is the hydrogel/liposome suspension that permits the prolonged and site specific delivery of the drug loaded into liposomes. Another innovative aspect is the ability to keep activity of protein drugs and

their intracellular delivery. The patch dosage form offers advantages such as drug dosing accuracy and easily handling.

### **3. Main advantages of the offer**

The drug delivery system proposed permits the effective topical administration of drugs and protein drugs.

The drug delivery system has been studied and evaluated for the administration of an enzyme (prolidase) involved in collagen synthesis and whose deficiency generates skin ulcers. In this case the drug delivery system demonstrated to be efficient in restoring intracellularly normal enzyme concentration.

The economic advantages for the manufacturer are highlighted in the efficacy of the innovative drug delivery system and therapy.

### **4. Technology key words**

Interactive patches, liposomes, chitosan, enzymatic intracellular delivery

### **5. Current Stage of Development**

Development phase – laboratory tested

### **6. Intellectual Property Rights**

Patent granted

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