MEDILIGHT: Miniaturized smart system for light stimulation and monitoring of wound healing

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Presentation of the project's goal & consortium

- Induction of "healing" for chronic wounds by individualized light therapy using red and blue LEDs.
- Specific monitoring and evaluation of the healing process using sensor data from the wound area (Temperature & Oxygenation)

Partners and budget

Total Budget: 2,988,033 Euro / Max. EU Contribution: 2,485,593 Euro
MEDILIGHT – model of photonic band

Keratinocytes

Fibroblasts
## Categories of healing stages

<table>
<thead>
<tr>
<th>Healing Stage</th>
<th>INFECTION (Bacteria)</th>
<th>CLEANSING (Macrophages)</th>
<th>GRANULATION (Fibroblasts)</th>
<th>EPIDERMISATION (Keratinocytes)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purpose</strong></td>
<td>Limit proliferation, virulence, formation of biofilm</td>
<td>Modulate inflammation mediators</td>
<td>Proliferation, synthesis (collagen), migration</td>
<td>Proliferation</td>
</tr>
<tr>
<td><strong>Tested in our lab</strong></td>
<td>Bacteria, fibroblasts and keratinocytes</td>
<td>Reduce inflammation</td>
<td>Proliferation of fibroblasts</td>
<td>Proliferation of keratinocytes</td>
</tr>
<tr>
<td><strong>Light</strong></td>
<td>Blue</td>
<td>Blue</td>
<td>Red</td>
<td>Red</td>
</tr>
</tbody>
</table>
In a nutshell

Goal to be achieved:

- Blue light for antibacterial and anti-inflammatory effect
- Red light for stimulation of fibroblasts and keratinocytes
- Do not create an imbalance by inhibiting just one or two bacterial strains because the remaining ones can become more active through selection.
Real-world application Needs and Unique Value

➢ Urgent patient needs
  – Chronic wounds = non healing wounds
    • Chronic wounds reduce quality of life and may lead to infections, amputations and even death!
    • Increasing with ageing population.
  – Common chronic wounds
    • Diabetic foot ulcers,
    • Leg ulcers (venous stasis ulcers),
    • Pressure ulcers
  – Burns

➢ Contact end-users (patients) with KOL, nurses, clinical personnel
  – Capability for clinical studies in higher Developmental stages (TRL 6-7)
Real-world application Needs and Unique Value

- Urgent Caregiver needs
  - efficient for all healing stages
  - Heal wounds faster
  - Safe treatment
  - Easy to handle (nurses/patients/doctors)
  - Flexibility for patient’s everyday life
  - Saving time and money
Innovation process & Technology Translation

• Our wish is to implement MEDILIGHT product as a disruptive technology that could address all healing stages (infected or not infected) (All-in-on product)

• The targeted market is the global market. Profitable market perspective in western countries is expected through public and private health care systems and private patients in emerging countries.

• We believe that MEDILIGHT will create a strong technological platform that could lead to several « product generations » in the future (Product diversification based on LED cycle, treatment etc.). For URGO, this project fits into the internal strategy to increase the market shares and to maintain its global competitiveness.

• **Road to technology translation and partners enabling this:**

After MEDILIGHT:

*Electronic Module:*

- (1) Microsemi or other EMS to fabricate the electronic module (for TRL>6)

*Photonic part:*

- (2) CSEM transfering light source technology to a main flexible manufacturer (e.g Contaq, ANDUS, Flextronics, etc.) to fabricate this part of the product
- (3) URGO to integrate the light source on the patch
  - URGO’s subcontractor for the sterilisation of the patch

*It will be possibly explored by URGO to undertake also step (2) and in this way control the whole disposable part, influencing significantly the value chain.*

• What investment is needed for TRL>6: An estimate number will be provided in the oral presentation.
Innovation process & Technology Translation

A New Industrial Transposition Unit in 2013

A few figures

- A dedicated industrial area of 1,400m² for prototype manufacturing
- A « bridge » facility between R&D (TRL:2-5) and the main URGO’s manufacturing facilities (TRL:9)
- Demonstrators for Medilight and later for the clinical studies (TRL 6-8)
- A global budget of 7,5M€
  - 3,5M€ dedicated to construction and renovation of the building
  - And 4M€ dedicated to mechanical devices

- A dozen people dedicated to this industrial unit
  - 6 engineers, 6 technicians
Road to Exploitation leading to flagship products

Infection

Healing

Gold standard

A

B

D

Gold standard

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Road to Exploitation and distance to the market

- **IN VITRO proof of concept (UHEI)**
- **Product Design**
- **In-vivo, Clinical Studies / Medico-economic study**
- **Regulatory / Health authority issues**
- **Industrial scale up**

*About 4.5-5 years after MEDILIGHT*
The following additional issues considered:

**IP**
- A bilateral collaboration between a research entity and an industrial entity of the consortium resulting in a co-ownership contract and patent to protect the results coming from this H2020 project.
- Does your consortium have already an agreement for the exploitation of the IP after the project?
  - Consortium Agreement has been done

**Manufacturing**
- Do you know who and how can be manufactured all the components of your systems?
  - Urgo converting and assembly into plasters
  - A preliminary plan has been drawn in Foil 8

**Access to the market**
- Does any of the partners in the consortium has direct access to the intended market?
  - URGO has direct access to the Advanced Wound Care Market
THANK YOU FOR YOUR ATTENTION

http://www.medilight-project.eu/

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