



A Hand Hygiene Assessment Device for Healthcare Professionals

Hy-GENSOR is a novel mobile, self-monitoring (SM) hand hygiene technology for busy healthcare workers.

The Hy-GENSOR principle is based on electrochemical sensor technology that scrutinises hand-hygiene status, offering quantitative infection-risk assessment in real-time.

Through its mobile device, Hy-GENSOR displays qualitative, alpha-numeric results to alert the user to finger or hand bacterial cell numbers. It can also provide a feedback statement on hygiene status. This gives Hy-GENSOR an advantage over swab-type colourimetric tests which only produce qualitative 'state-of-cleanliness' estimates. The technology can potentially extend to higher quality information, such as species identification.

Importantly, the technology provides rapid assessment and result times compared to microbiological techniques which require hours, or

even days to confirm results.

The Hy-GENSOR sensor technology is composed of a micro-porous membrane possessing a hydrophilic gel sub-layer with consumable redox reagents. A finger, or palm touch to the membrane transfers microbial cells (bacteria) onto the gel surface. Cellular enzymatic reactions ensue which are quantified by a coulometric electrode system beneath the hydro-gel.

This electronic signal is calibrated in cell-count surface density and data is displayed, stored or Wi-Fi up-loaded via a pocket meter.

Applications

Hy-GENSOR is intended for use throughout the healthcare industry, covering social, hygiene and surgical hand-washing. The device would have specific applications in efficiency analysis (hand-wash protocols), spot-test evaluations, liability and risk assessments.

Hospital wards, GP surgeries, Clinics and Dentists are all potential users of this technology.

Opportunity

Hy-GENSOR offers a significant commercial opportunity for a company operating within the healthcare or diagnostics industry. The UK alone has over 200 large NHS hospitals and thousands of healthcare personnel constituting a minimum market size of over €20m in disposables (daily testing per annum).

Hy-GENSOR, therefore, would make an ideal product portfolio addition to a hospital-hygiene provider with an established sales network for hygiene-related products.

Advantages

Hy-GENSOR offers a number of unique advantages:

- **Immediate Hand-Hygiene Evaluation** – provides rapid assessment and time to result.
- **Higher Quality Information** – provides qualitative, alpha-numeric results.
- **Portable Skin-Sampler** – the SM strip reader acts as a portable electronic controller for signal acquisition and data storage.
- **Minimal Operator Intervention** – user simply has to insert an SM strip into the device and swab fingers or hands.
- **Low Cost, High Volume Production** – design features and methodology associated with this technology facilitates low cost and high volume manufacturing.

Stage of Development

Hy-GENSOR was developed by researchers at the Microsensors for Clinical Research and Analysis (MICRA) centre in the Institute of Technology Tallaght in Dublin (ITT Dublin) with generation of test data enabled via an undergraduate project.

DIT Hothouse is currently seeking expressions of interest from companies interested in licensing and developing the product.

The novel and patentable features of Hy-GENSOR are contained in the design and methodology associated with the main SM strip components, including the skin-sampling touch membrane and the electrode-sensor system.

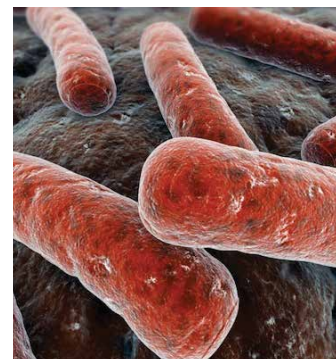
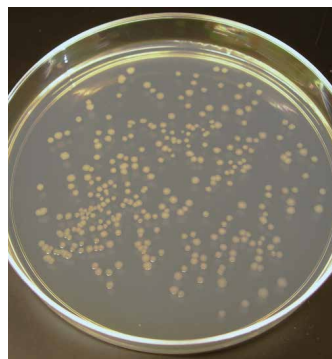
Pre-commercial prototypes have been developed and successfully trialled in a laboratory environment.

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Further development work by a licensee will likely be required on product development, engineering and commercial scale production. Branding, distribution partners and routes to market are other considerations.

Right:

Concept image of the Hy-GENSOR Hand Hygiene Assessment Device



Above:

An agar plate used to culture bacteria colonies such as *E. coli* (above right) in the trialling of Hy-GENSOR

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