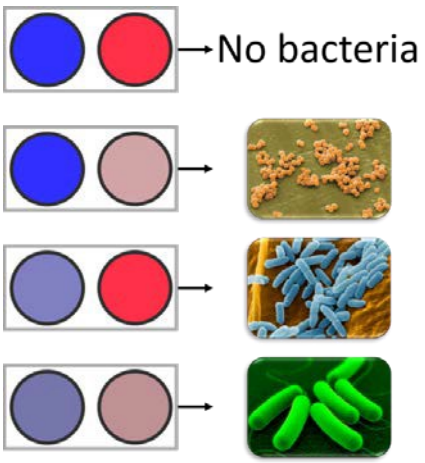
UNIVERSITY OF WATERLOO

TECHNOLOGY SUMMARY



Reference

8810-7366

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Patent Status

PCT CA2014/050482 nationalized to US application

Stage of Development

Achieved a working prototype

& Ongoing development on contact lens containers

Contact

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Rapid Bacterial Testing Nano-biosensor

Background

One in ten people in North America wear contact lenses and the global contact lens market size is estimated to reach $13.47 billion globally by 2019. Almost 80% of wearers opt for reusable lenses and require a contact lens storage case. These storage cases are prone to contamination of by pathogens that can cause bacterial and fungal keratitis in users, which leads to pain, redness, sensitivity to light and potential loss of vision. The effective treatment of keratitis requires identification of pathogen, which using current methods requires several days to culture and identity the bacteria, which in the interim period can lead to incorrectly patient prescribed antibiotics and ongoing harm to eye health. Thus there is a need to develop a quick and cost effective diagnostic test that enables contact lens wearers to perform more routine preventative testing of their storage case condition.

Description of the invention

Waterloo researchers have engineered uniquely shaped nano-particles that change color in the presence of harmful levels of the bacterial. The nano-particles can be designed to selectively provide a unique color change for each bacterial strain of interest. This provides a visual indication at the point-of-care such that the strain responsible for infection could be identified rapidly.

Advantages

This novel nano-biosensor can provide selective bacterial detection rapidly (ca. 5 minutes) and requires no use of companion biomarkers or biomolecules and thus is very inexpensive to produce. Additionally the nano-materials can be used in liquids or on solid platforms thus enabling many product packaging options.

Potential applications

Although inspired for use with contact storage lens cases, this nano-biosensor could have much wider applications such as:

- Food processing safety
- Drinking and wastewater testing
- Industrial process water (Oil and gas wells, cooling towers, etc)
- Health care institutions (eg. hospitals)