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Cast Sense

A01 Group 2

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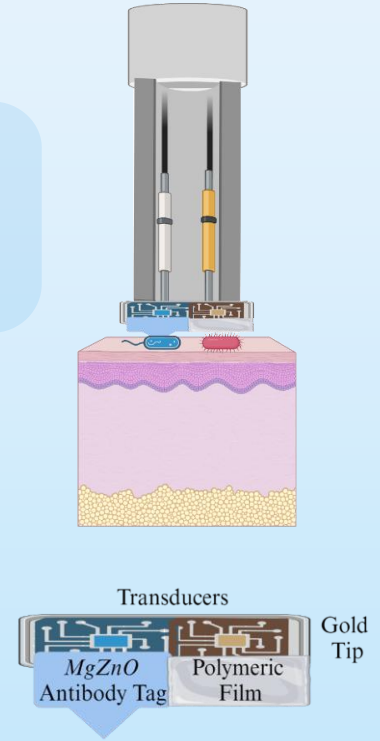
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The Problem with Traditional Casts

- Traditional casts prone to bacterial contamination, leading to severe infections

Stats

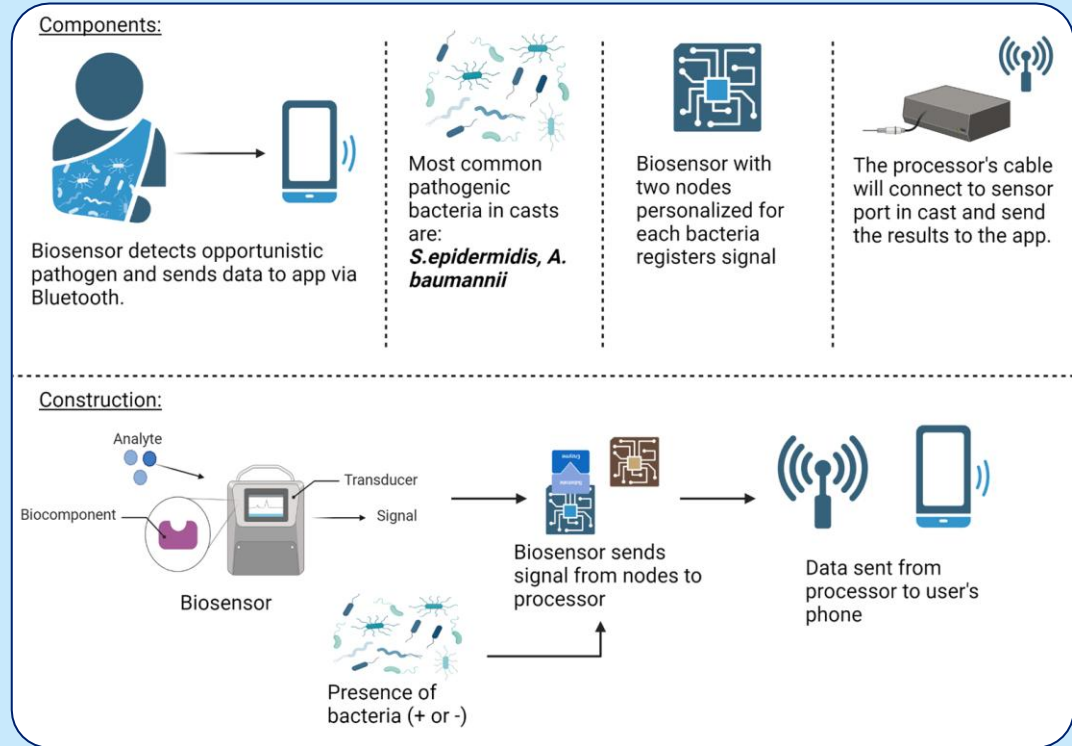
- 6.3 million fractures per year in the US²
- *A. baumannii* infections in approximately 1 million cases annually¹⁰
- Crude mortality ranging from 20–80%¹⁰

Impact

- Infections can lead to complications, prolonged recovery times, and increased healthcare costs

Product Description (1 of 2)

- Main component: Biosensor
- Detection of two bacteria²⁴
 - *S. epidermidis*
 - *A. baumannii*
- Presence data sent to processor, analyzed



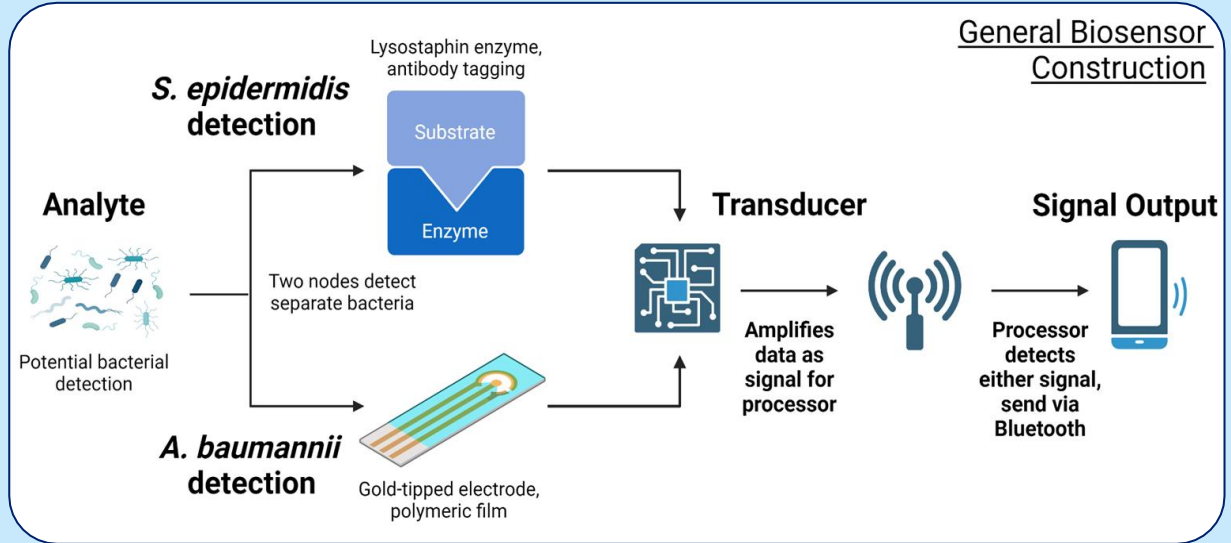
Product Description (2 of 2)

S. epidermidis Node

- MgZnO protein tag that binds to the lysostaphin enzyme produced by the bacteria¹⁵

A. baumannii Node

- Gold tipped electrode covered in a polymeric film to register the impulse of the PH interaction of the monomer 1,3-DAP in *A. baumannii*^{1,12,15}



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If signal,

>0.03 V (Present)

<0.03 V (Not Present)

Intellectual Property

- **Patents:**

- 49,980 active patents related to biosensors in the US¹⁷
- We discovered 8 patents relevant to biosensors with bacterial detection and/or wearability

- **Workarounds:**

- May have to obtain license to use biosensors under broader patent
- Claims of patents of relevant biosensors:
 - 1) Comprising different components (ex. picocameras³, luminescent materials⁸)
 - 2) Have different modes of detection (ex. diffusion²⁵, via thiolated DNA aptamer¹¹)
 - 3) Have different sensing targets (ex. *E. coli*⁶, moisture levels⁸)
 - 4) Have different applications (ex. Disposable absorbents¹⁹)

Market Analysis

- **Target customers:** Hospitals and doctors to include in casting treatments
 - Insurance companies to cover cost to patient of our preventative care device

Direct Competitors

- CastMinder: Evaluates conditions that increase likelihood of bacteria⁴
 - Pressure, temperature, moisture
 - Does NOT evaluate presence of bacteria
- Undersaturated market

Wearable Biosensor Market Projected
Market Value (2033): \$65,400.2 Mn⁹

Indirect Competitors

- New innovations of cast with increased ventilation and antimicrobial properties
 - Cast21, PLA-CaCO₃ Composite Splint^{7,22}

Regulatory Compliance



- Center for Devices and Radiological Health
 - Patient Monitoring and Control Program
- Require Clinical Trial
- Must have label indicating use and any warnings



- Environmental impacts
 - Manufacturing
 - Specific materials
- Computer and Electronic Product Manufacturing Sector

Join Us in Revolutionizing Cast Care



Help manage infections
for thousands

Utilize an antibody tag
and polymeric film as
the biological
component

Create a unique new
intellectual property

Target hospitals and
doctors to use in
fracture care

Approved by the FDA
and EPA

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