

Expanding the Vision:  
*Does It Feel Crowded  
In Here To You?*

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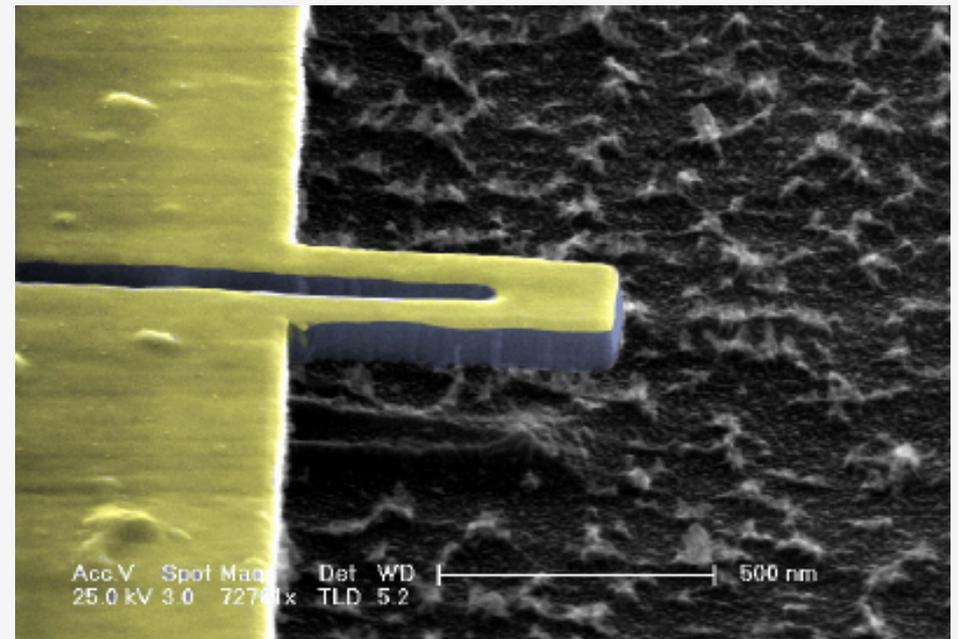
# Introduction

- Using nanosensor technology to show a crowd what invisible pathogens are in the air around them
- Make people consider importance, prevalence of microorganisms



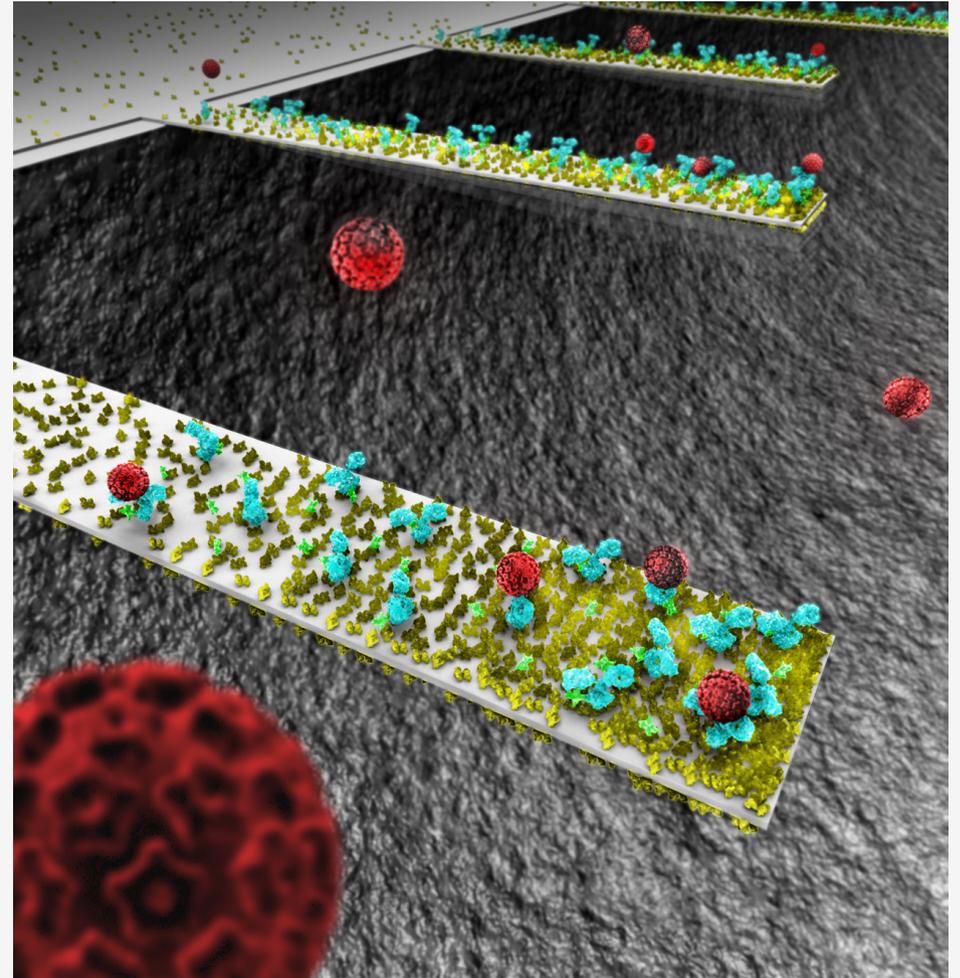
# The Technology: Nanocantilever-based Biosensors

- Like a tiny diving board made of silicon
- Vibrates at a certain frequency when something small sticks to it
- Incredibly sensitive to very small quantities of something – like pathogens



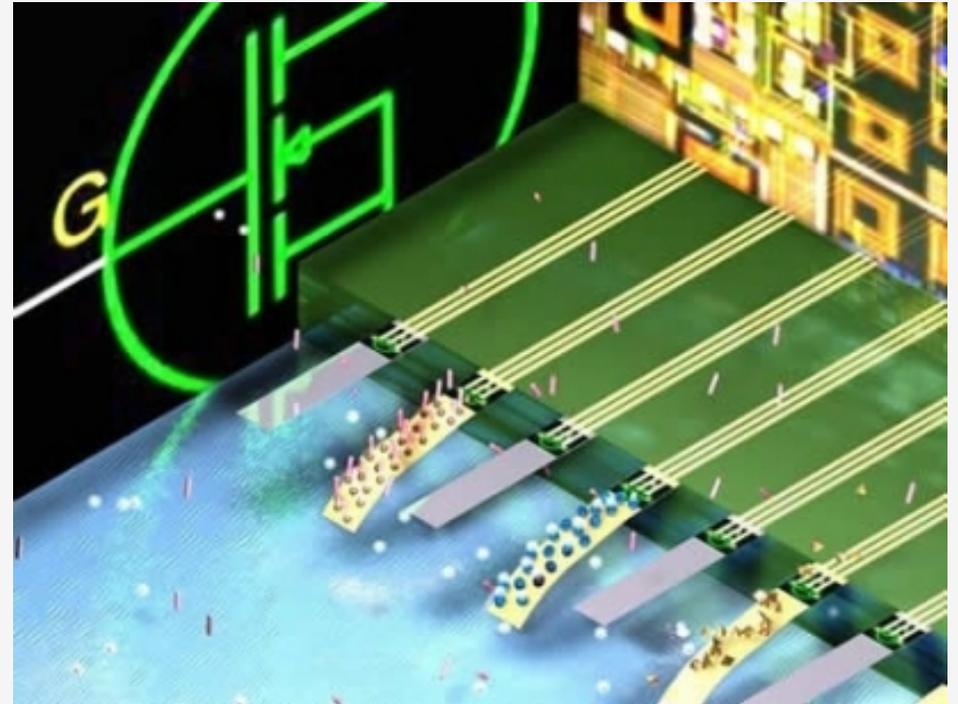
# The Technology

- Nanocantilevers: yellow panels
- Viruses: red spheres
- Antibodies: blue spots on nanocantilevers

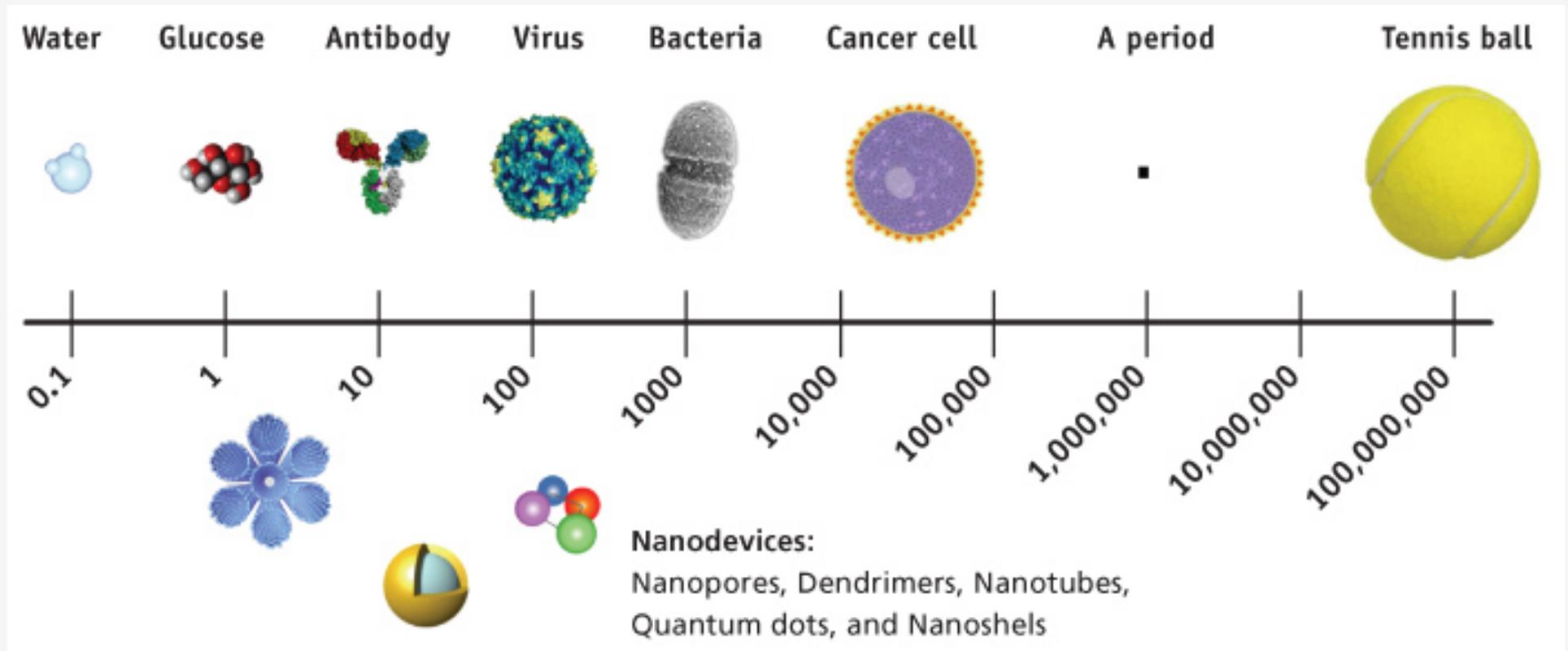


# The Technology

- Only a few microns in size – thousands on a square centimetre
- Dipped into antibody-rich liquid to get proteins onto surface
- Only a certain pathogen sticks to a protein – this says what it has found



# The Technology



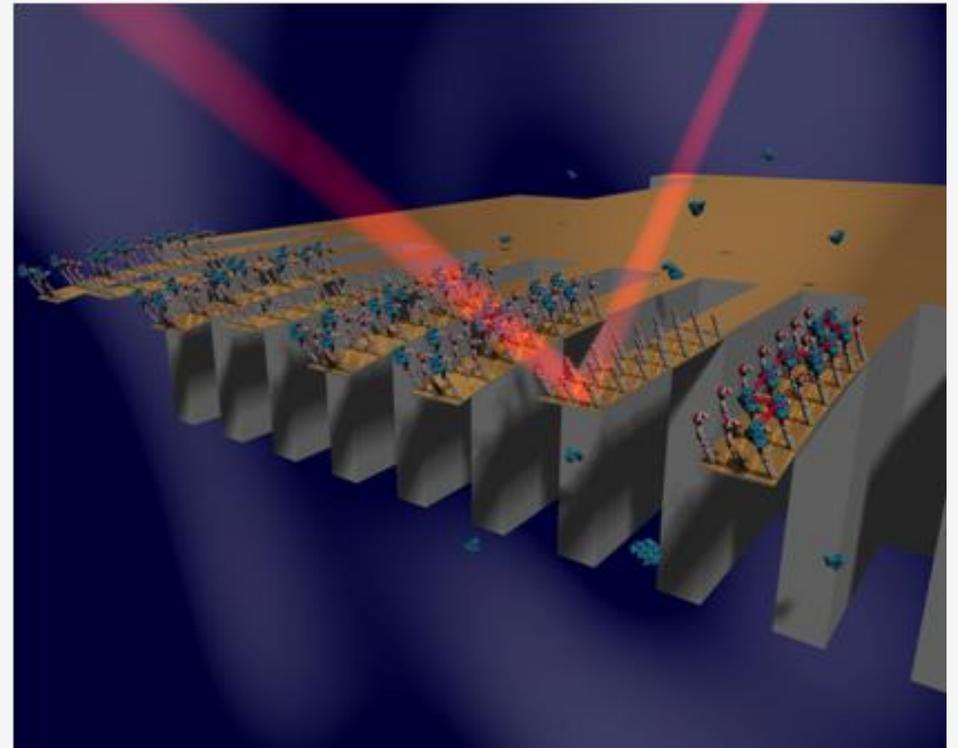
# The Technology

- Resonance frequency is related to mass
- When contaminants land, mass changes and resonance frequency increases
- At larger scales, resonance frequency increases instead

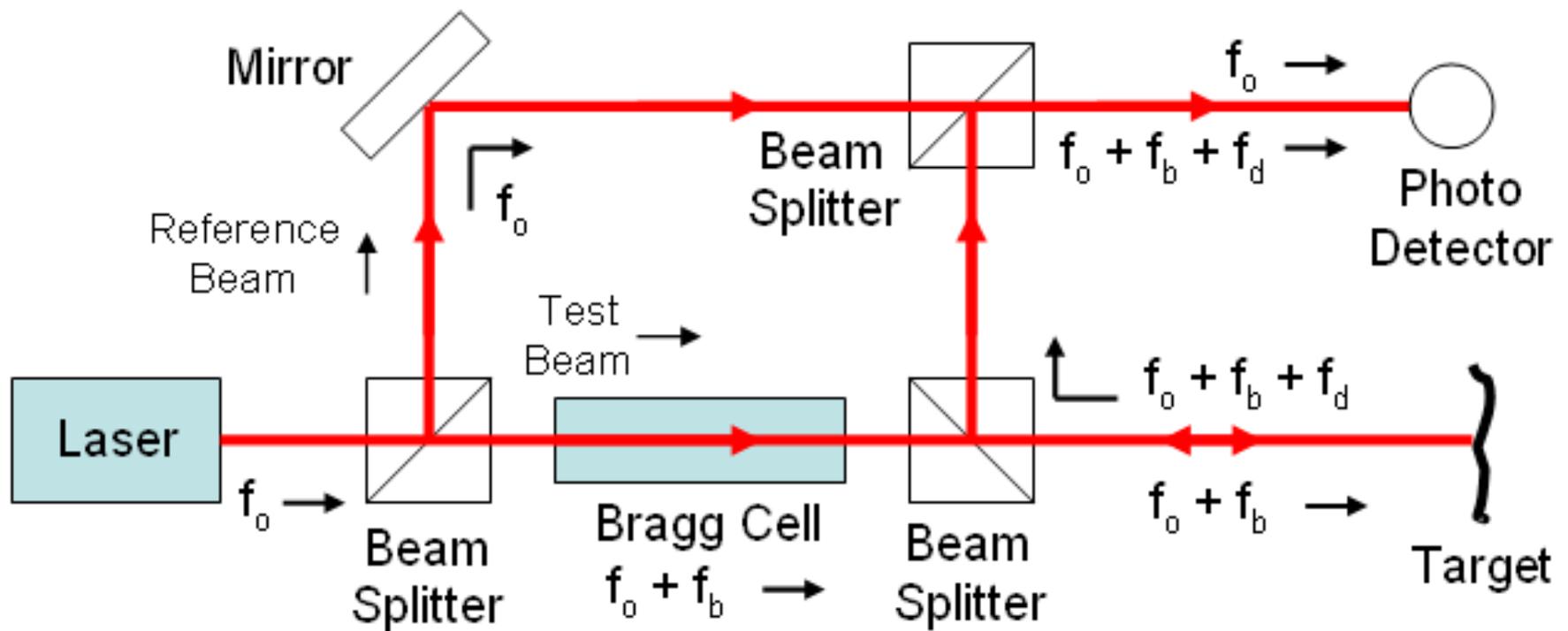


# The Technology

- Frequency measured with laser Doppler vibrometer – doesn't affect mass
- Change in frequency of vibration in relation to position of laser

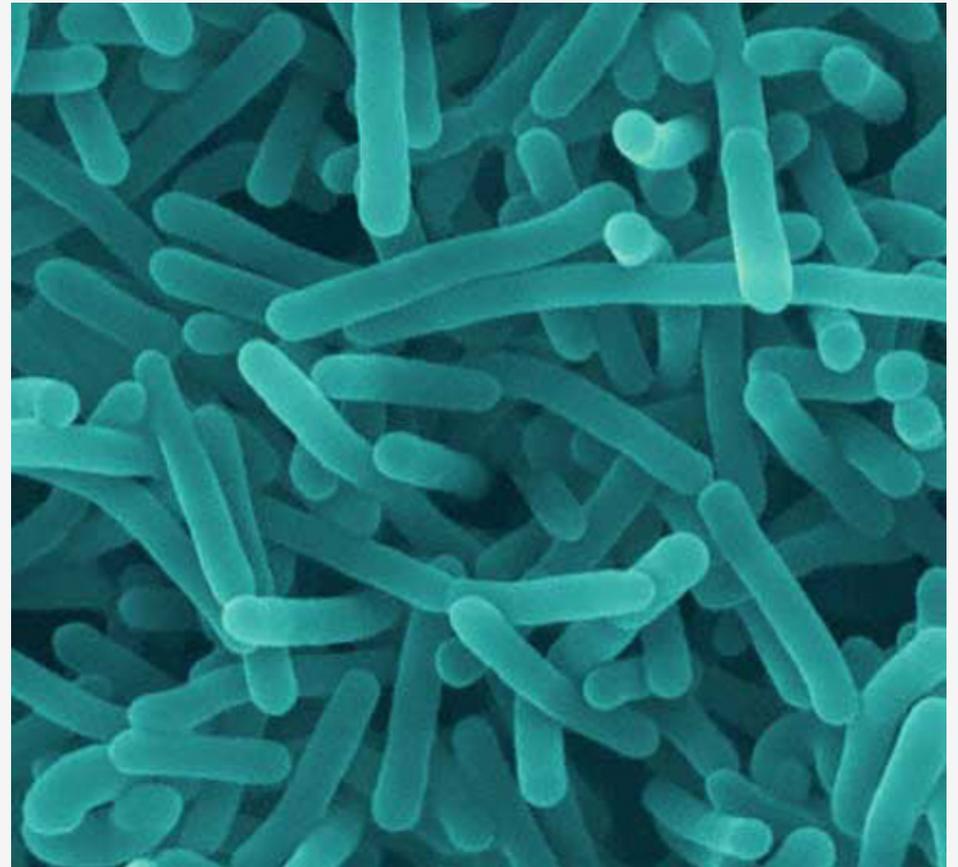


# The Technology



# The Technology

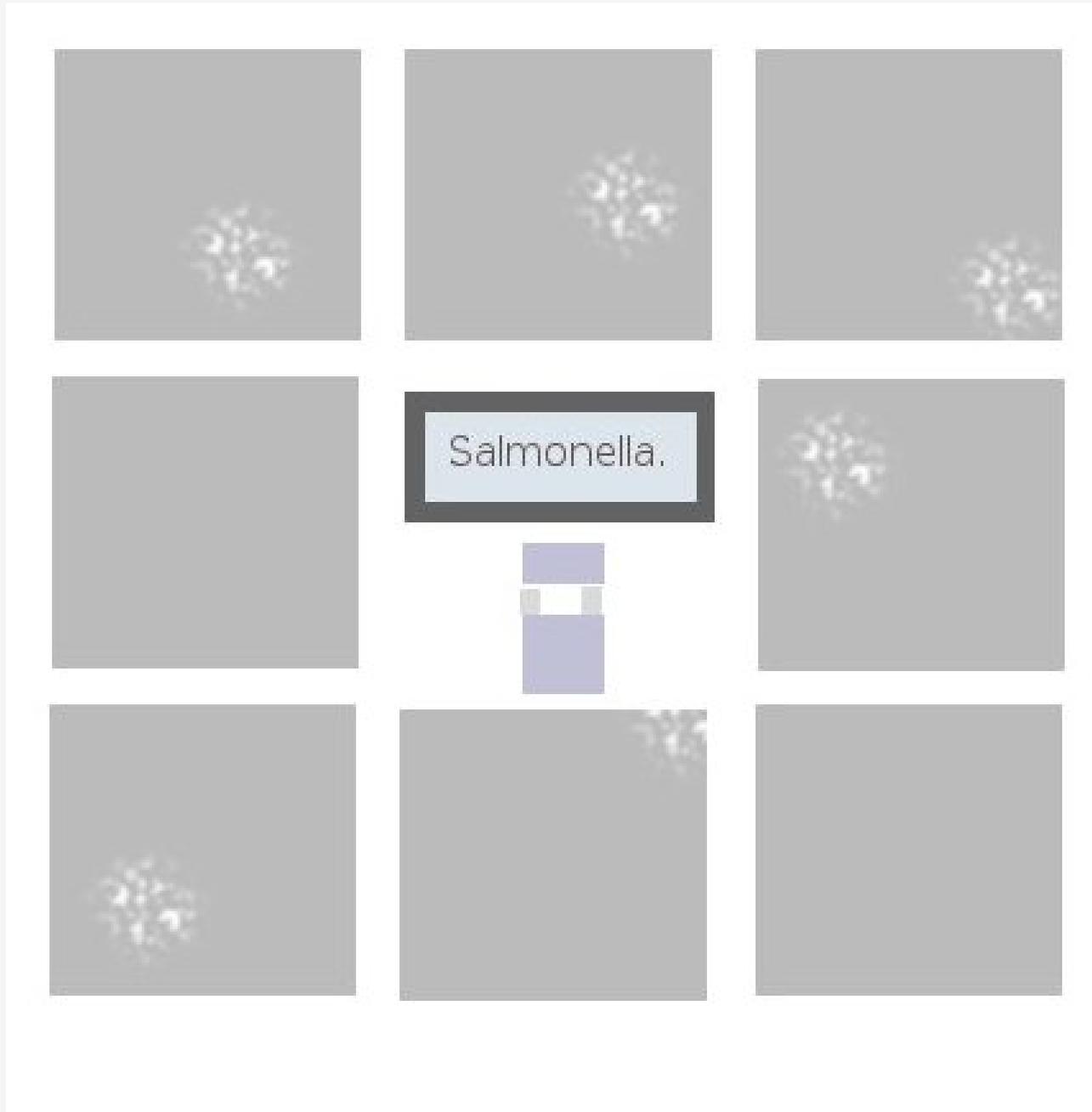
- Early-warning system for contaminants in a space
- New versions can detect genetic sequences – instead of antibodies, attach nucleic acid sequences
- Detect genetic changes



# The Space

- Eight 3'x3' square stainless steel panels, 1-2" deep with hollow back for electronics
- Panels hang on blank wall in a 3x3 grid (no center tile)
- A screen in the center displays small text
- Each tile packed with nanocantilevers and tiny fiberoptic lights – pinpricks
- Sensors will detect common viruses, bacteria, fungi
- Hand sanitizer dispenser mounted below the screen

# The Space



# The Experience

- When people walk past the sensors some will be triggered
- Fiberoptic lights around the sensor glow and fade
- Name of pathogen will appear on screen with statistics / facts



# The Experience

- Strangers crowd together to read the screen
- Can clean their hands if concerned by their new awareness of contamination



# The Vision

- Make people notice things too small to see
- City life, medicine have not removed us from the world of microorganisms
- Acknowledge, continue to co-exist – we aren't the only creatures around



# Resources

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