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FollowKnee



Multi-sensor system for knee implants:
detects infection and facilitates surgery and rehabilitation

What is FollowKnee?

CEA-Leti introduces FollowKnee, a smart integrated multi-sensor system for knee implants that drastically reduces the risk of revision surgery. FollowKnee provides reliable data leveraging three sensors and an accelerometer. The data collected facilitates knee surgery, post-op care, and rehabilitation:

- **More accurate fitting:** Deformation sensor and accelerometer: help the surgeon position the implant more accurately.
- **Early detection of infection:** pH and temperature sensors: detect infection early, a world first.
- **Detection of mechanical troubles issues:** Deformation sensor and accelerometer: trigger an alert in the event of loosening or deformation.
- **Better rehabilitation:** Accelerometer and deformation sensor help physiotherapist better adapt therapy.

Applications

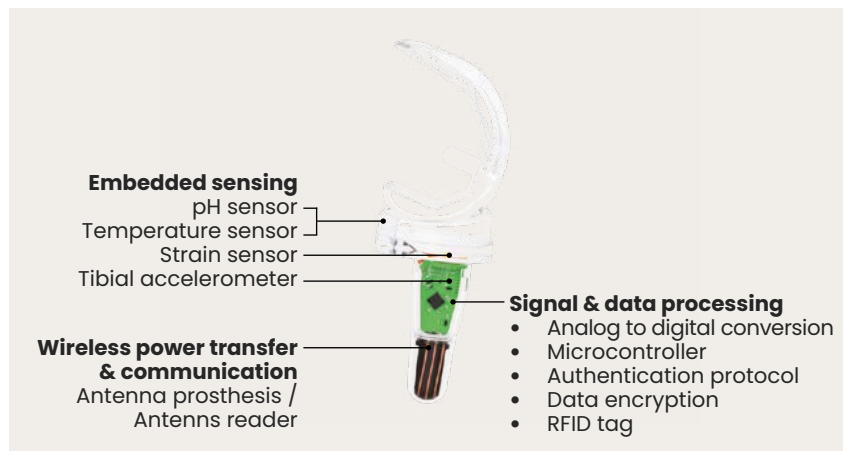
- Knee replacement
- Hip replacement
- Shoulder replacement

What's new?

CEA-Leti's team leveraged its solid expertise in sensor and integration technologies to develop:

- The first pH sensor in contact with living tissue to detect infection
- The first low-power deformation sensor
- A biocompatible system
- Highly compact electronics powered via inductive coupling

The sensors and electronics are integrated into the titanium tibial baseplate.



Key facts

- 1 patent
- Unveiled at CES 2022
- +673% increase in knee replacements expected by 2030
- +3.5 million increase in surgeries worldwide

Source: The Center, Orthopedic & Neurosurgical Care & Research, Bend, Oregon



What's next?

- Mechanical and functional testing in progress
- Partnership with the University hospital, Brest, France
- Additive manufacturing (3D printing) of FollowKnee
- An augmented reality surgical assistance solution to improve fitting of the implant

Interested in this technology?

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