



**COMBINING
TECHNOLOGIES.
EMPOWERING
ARTHROSCOPY.**

**MID-INFRARED ARTHROSCOPY
SPECTROMETER SYSTEM**

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THE FUTURE OF ARTHROSCOPY

MIRACLE team is developing and assembling multiple technologies in the **first mid-infrared attenuated total reflection (MIR-ATR)** instrument for arthroscopic use.

The developed technologies include several **innovative photonics components** such as miniaturized MIR-ATR probe, QCLs and Main Unit electronics to integrate these **unique elements**.

These advanced technologies can be employed beyond our MIR-ATR arthroscopy spectrometer system, opening **new horizons** for several fields such as medical equipment, environment, pharmaceutical, biotechnology, process optimization and many more.

By empowering arthroscopy, we are placing Europe at the forefront of **photonics technology**.



Hook Probe

Miniaturized MIR-ATR probe with innovative hook-like design facilitating transfer into clinical practice



QCL

Quantum Cascade Lasers (QCL) with clinically relevant wavelengths to assess articular cartilage biochemical composition



iBEAM

A unique integrated beam combiner for effective coupling of QCLs and MIR-ATR probe



Main Unit

Mechanical construction and compatible electronics integrating all the photonics components



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