

Technology Opportunity, Ref. No. UZ-20/027

CAARMA, a magnetic apparatus for *in-vivo* bio-applications.

We offer a biologically-safe and easy-to-implement device for the study of *in-vivo* micro-rheological and force-regulated processes at the cellular and tissue levels. CAARMA can be seamlessly integrated onto commercial confocal microscopes enabling the correlation between mechanical responses and structural changes during growth and development e.g. in embryos or cell culture.

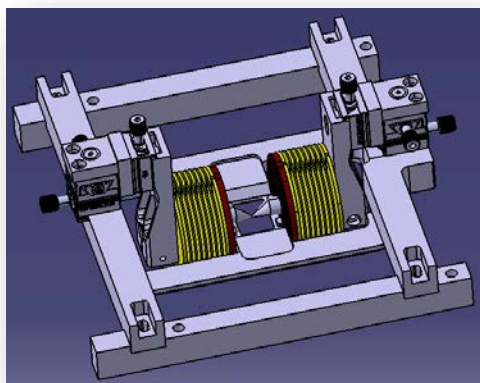
Keywords magnetic tweezers, microrheology, cell/tissue mechanical response

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Reference "Magnetic tweezers optimized to exert high forces over extended distances from the magnet in multicellular systems" RSI **89**, 045106 (2018); <https://doi.org/10.1063/1.5010788>

www.caarma.info

Background Recent experimental evidence demonstrates that mechanical forces activate mechanotransduction pathways and are responsible for the active shape change of the cells during growth and development. The controlled application of forces and the associated mechanical response at both the cellular and tissue levels is an attractive clue to answer the increasingly demanding biophysical questions at hand. To date, the scarcity of knowledge on the magnitude of the forces involved in biological processes is a great limitation largely due to a lack of biologically-safe mechanical measurements *in-vivo*.



Invention This invention provides a perfect toolbox for studying the mechanical properties of biological macromolecules, the microrheological properties of soft matter, tissues and the force-regulated processes in living organisms.

The device offers a clever and modular design for a comprehensive integration into commercial microscopes and an easy customizability into home-built setups.

The CAARMA device is accessible to any lab without requiring specific skills for use and thus additional costs for highly trained professionals.

Fields of Use biophysics, polymer science, biochemistry, cell biology, teaching settings and many other fields.

Patent Status Patent filed

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