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Strategles for the developmeNt oF custOmized 3D meNIscAl substitutes (SINFONIA)

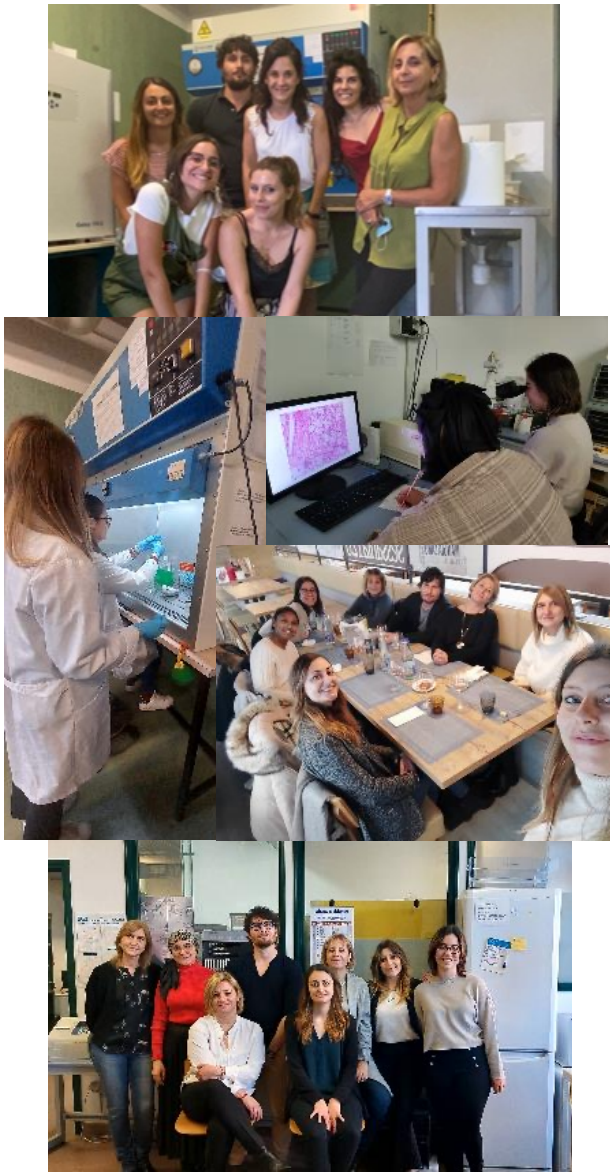
Monica Mattioli Belmonte Cima

Department of Clinical and Molecular Science (DISCLIMO) - www.univpm.it

Prof. Monica Mattioli Belmonte Cima, PhD,
Full Professor in Human Histology and Embryology

Head of the MorpHis Lab - School of Medicine

Co-author of more than 200 publications in the field of morphology, biomaterials, and tissue engineering. https://orcid.org/0000-0002-2087-2776 (publication list; H-index = 41)



The Histology Group is composed by two Associate Professors: (Prof M. Orciani and Prof. S. Marchi), one technician (Dr. G. Lucarini), 4 post-doc (Dr. C. Licini, Dr. F. Marchegiani, Dr. M. Di Vincenzo, Dr. P. Pellegrino) and 4 PhD students (Dr. N. Dhaouadi, Dr. D. Lamanna, Dr. I. Nunzi and A. La Contana)

Main collaborations with: Centro Piaggio Università di Pisa; Centro Ortopedico Rizzoli – Bologna; Politecnico di Torino; Università di Bari; Università di Modena e Reggio Emilia; Newcastle University (UK) ; Università Milano Bicocca; Università di Bologna; Università di Ferrara; Cornell University - New York (USA); INSTM; Centro 3R.

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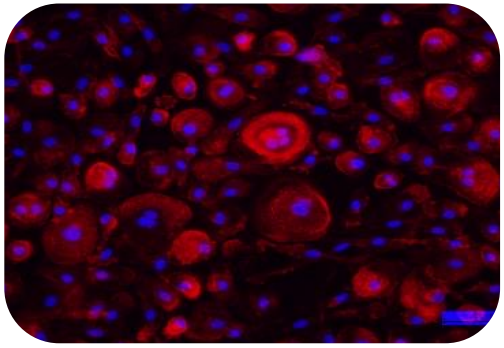
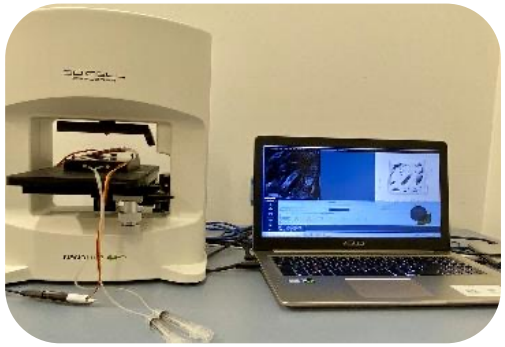
Supervisor: Prof. Monica Mattioli-Belmonte

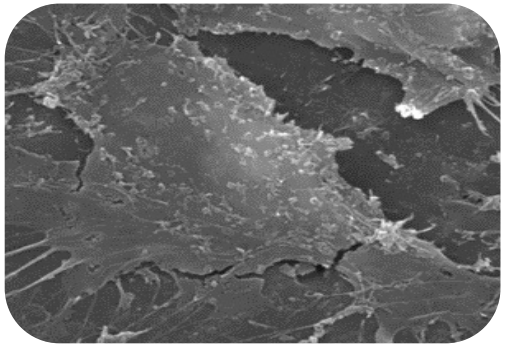
MorpHis Lab



Skills: cell lines, primary cells or adult MSCs (harvested from different anatomical districts), monolayer and co-cultural approaches, morphological (light and electron microscopy) and molecular biology (qRT-PCR, WB) techniques, analysis of mitochondrial parameters.



Equipment: laminar flow hoods, Realplex qRT PCR, luminometer for Ca^{2+} measurements, light and fluorescence microscopes, spectrophotometer with microplate reader, UVITEC, Synthecon rotary cell culture system, and Tomographic Microscope 3D Cell Explorer-FLUO by Nanolive.



Facilities: CLSM , SEM and TEM, FACS and Tecan Infinite Microplate Reader for fluorescent and bioluminescent assays .

European fundings:	Biological Unit for the ERC – BOOST (GA 681798).
	CHETCH European Project in the 7th European Framework (MARIE CURIE ACTIONS - International Research Staff Exchange.
National funding:	"MIND" PRIN 2010-2011 project (Protocol 2010J8RYS7)
	PNRR "Vitality"
	PoWer PRIN 2022 (Protocol 20222P2NAJ)

Research Keywords	Stem cells
	Biomaterials
	Tissue engineering
	Inflammation
	Mitochondria
	Ageing
	miRNA
	Imaging

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Supervisor:

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16 SCIENTIFIC AREAS

BIO/17, MED/02, MED/04, MED/05, MED/06, MED/09, MED/12, MED/13, MED/15, MED/16, MED/31, MED/33, MED/35, MED/44, MED/46, MED/50

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CLINICAL RESEARCH UNITS

Strategies for the developmeNt oF custOmized 3D meNIscAl substitutes (SINFONIA)

Background: *Meniscal injury reduces its capability to act for shock absorption, load distribution, proprioception, and protection of the cartilage from accelerated degeneration Meniscus surgery is one of the most performed orthopaedic procedures worldwide.*

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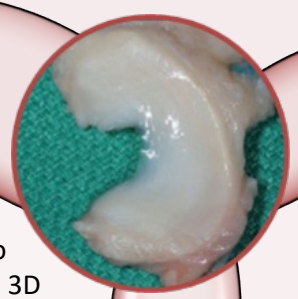
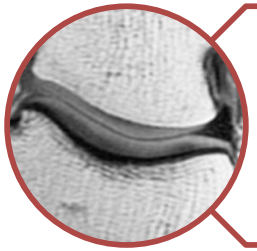


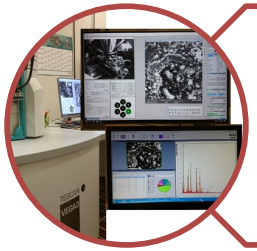
Aim: The project aims to validate in vitro customized 3D meniscal substitute(s) replicating the biomechanical and biochemical properties of the meniscus.

Pillars of the research project:

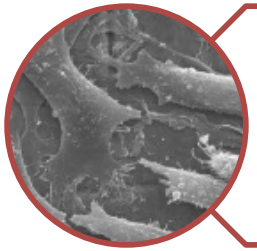
- Clinical study
- Additive manufacturing and in-depth structural, physicochemical, and mechanical characterizations
- *In vitro* appropriate cell models



Orthopedic Clinic of the Azienda Universitaria Ospedali Riuniti of Ancona



Group of Physics of Condensed Matter at SIMAU.



Physico-chemical data are key elements to get insight in structure capability to modulate cells differentiation and protein expression

mutual crosstalk