



02.04.2025. Webinar Obzor Europa: Klaster 1 Zdravlje

LUMINATE

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Zavod za molekularnu biologiju, Biološki odsjek
Prirodoslovno-matematički fakultet Sveučilišta u Zagrebu



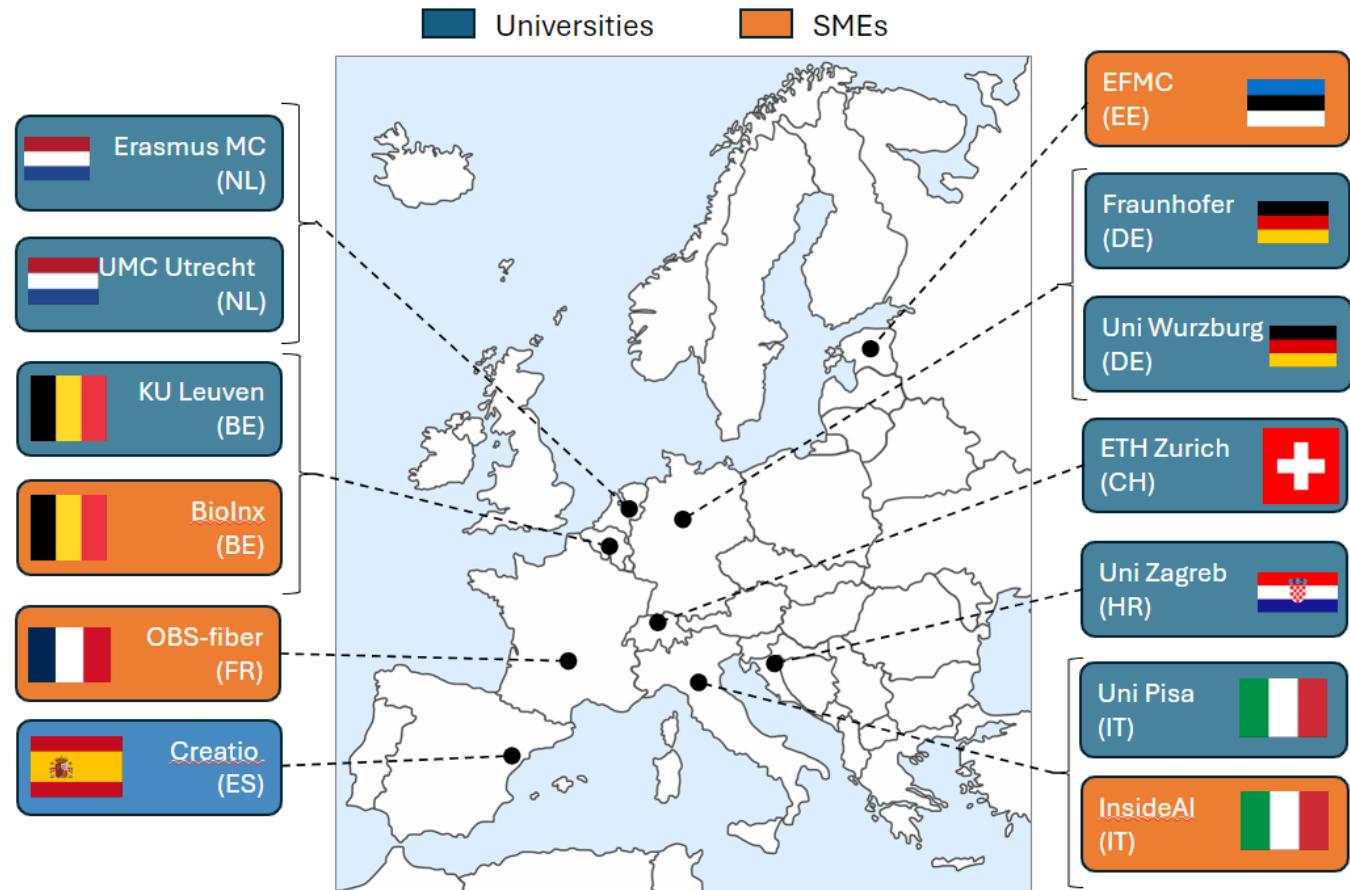
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Osnovne informacije

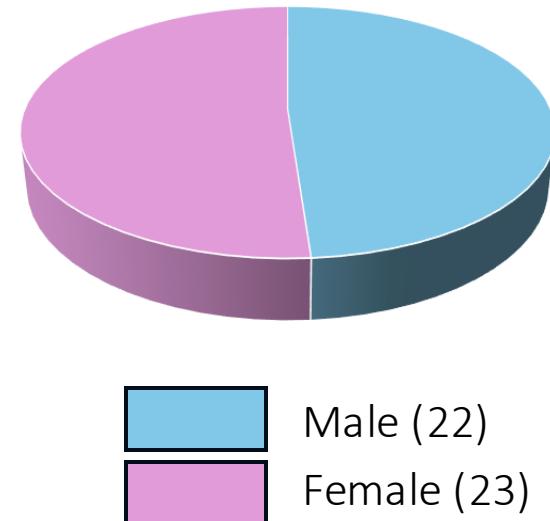
- Naslov projekta: Lighting the way towards in situ osteochondral regeneration through microextrusion and filamented light bioprinting (LUMINATE)
- Ugovorni broj: 101191804
- Poziv: HORIZON-HLTH-2024-TOOL-11
- Početak: 01/01/2025, kraj: 31/12/2028
- EU sredstva: €7,459,148.75

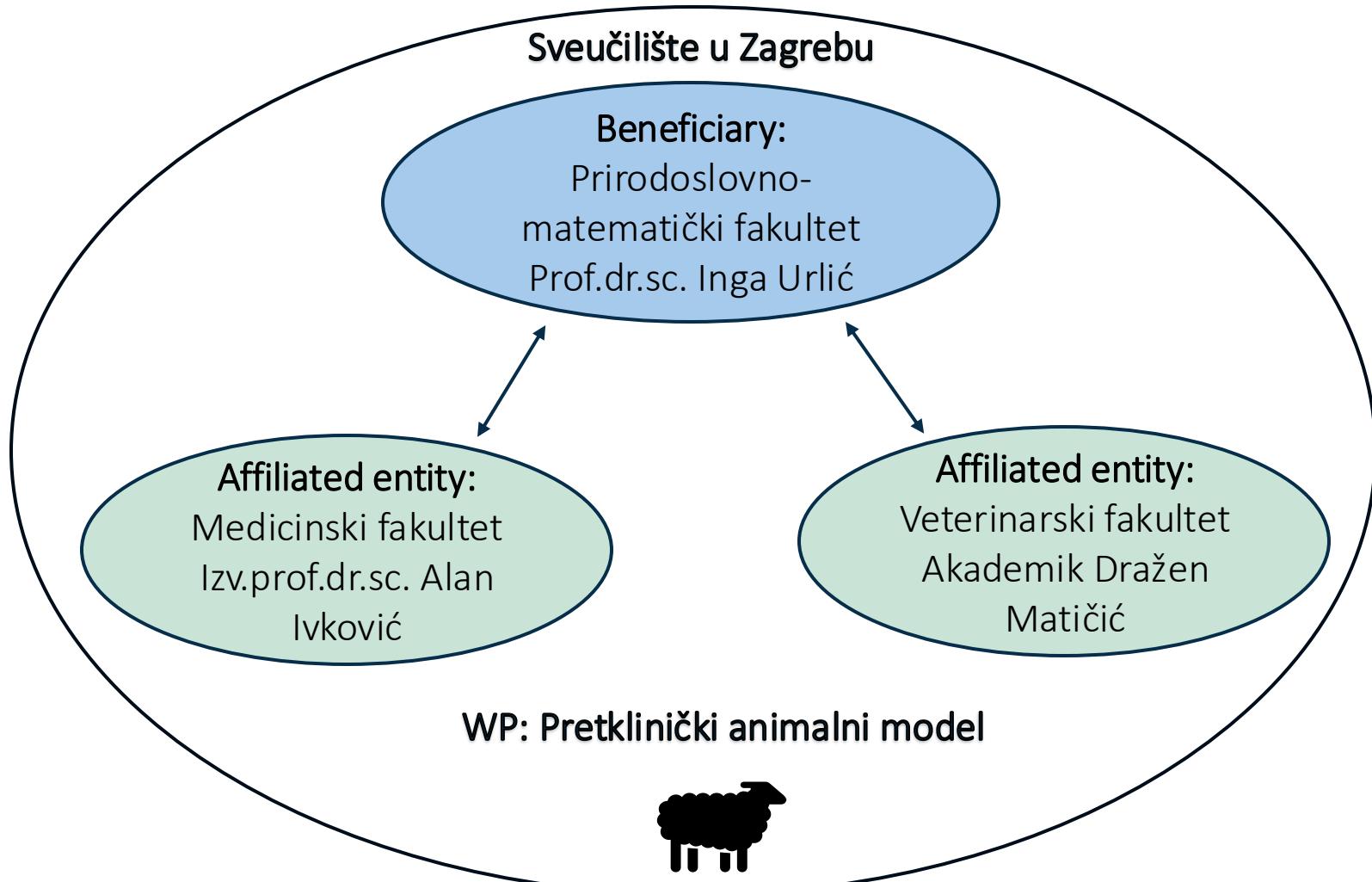
Konzorcij projekta



Key figures:

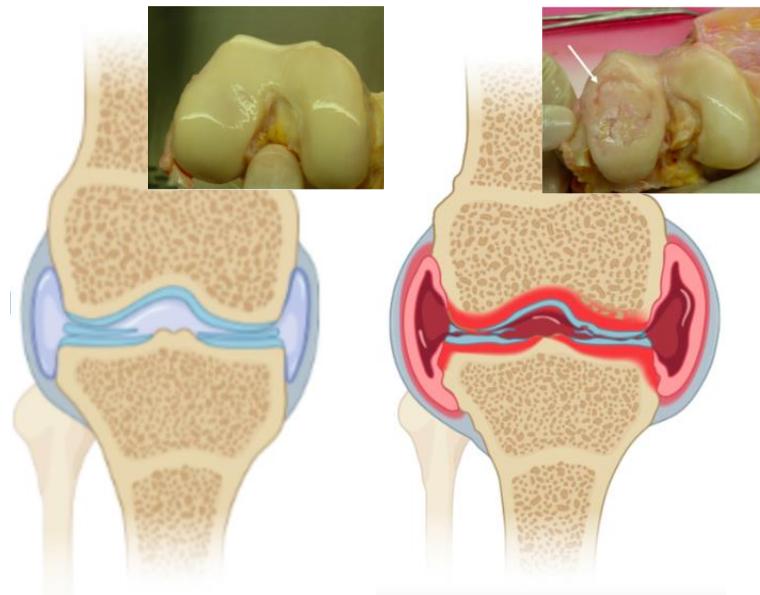
- 15 partners from all over EU
- Gender balance among researchers and WP leaders



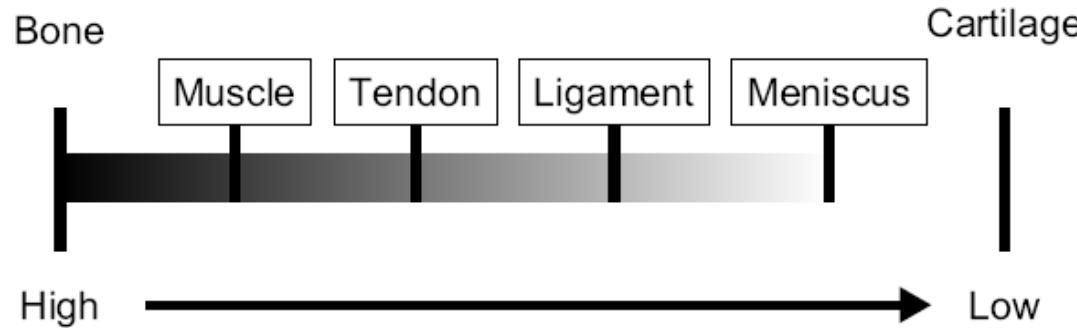


Akutne osteohondralne ozljede

- Traumatske ozljede osteohondralnih tkiva uzrokuju bol, funkcionalno oštećenje te povećan rizik od razvoja posttraumatskog osteoartritisa i pridruženih komorbiditeta.

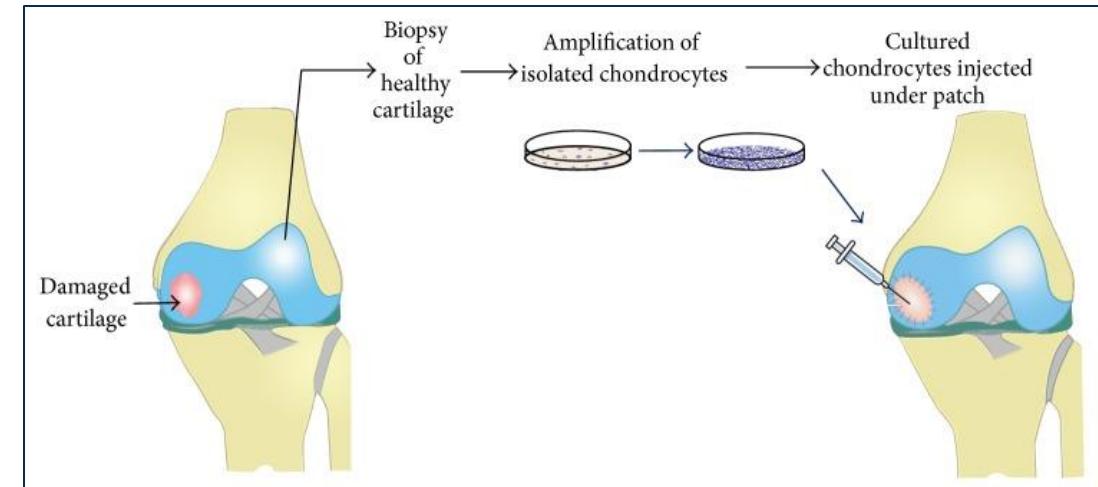


The spectrum of regeneration potential of musculoskeletal tissues



Strategije liječenja

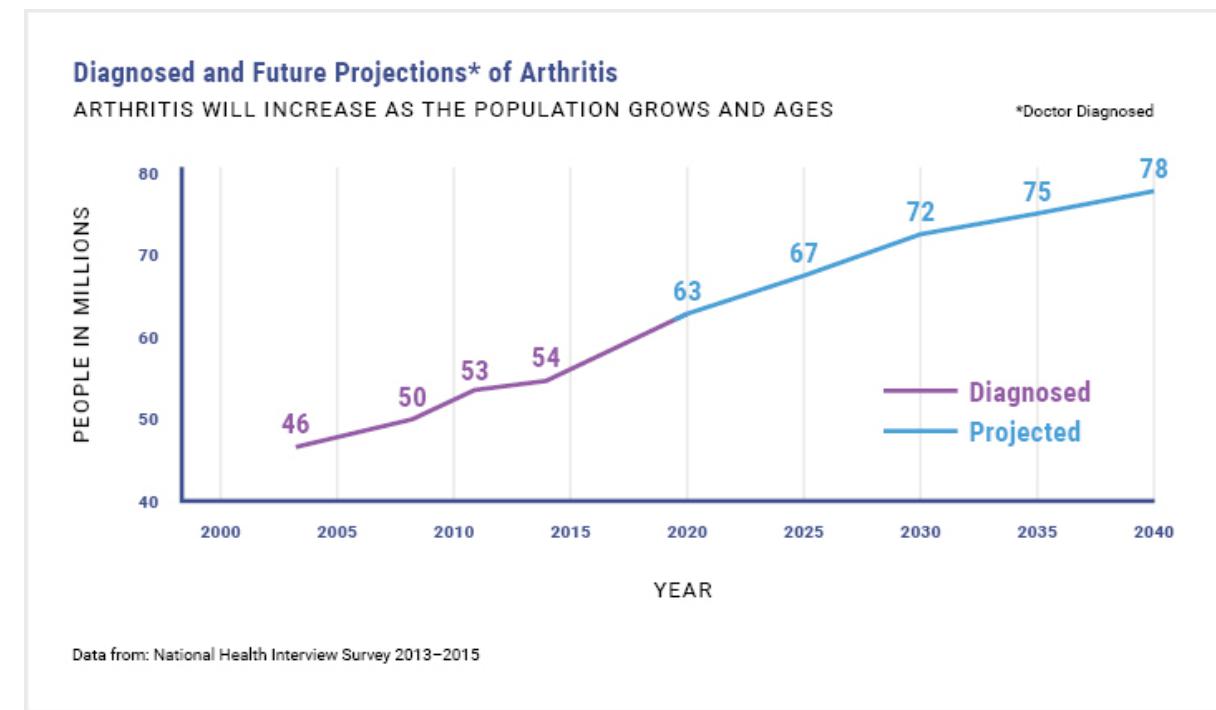
- Palijativne (gubitak težine, fizikalna terapija, sistemski analgetici)
- Neregenerativne (hondralno brijanje, debridman, lavaža zgloba)
- Regenerativne/reparativne (mikrofrakture, artroplastika koljena, MFAT, PRP)
- Transplantacijske (osteohondralna transplantacija, mozaikplastika i MACI/ACI implantacija hondrocyta) →





Nedostaci transplantacijskih tretmana

- Tretmani temeljeni na graftovima bez stanica ili staničnim terapijama, skupi su i ograničene dostupnosti
- Rizik od revizije ovih implantata neprihvatljivo je visok kod mladih aktivnih pacijenata
- Nužno je razvijanje boljih strategija liječenja akutnih osteohondralnih ozljeda



Predloženi koncept liječenja oštećenja hrskavice u jednom koraku

Stanice

Biomaterijal

Dostava

Knee injury resulting in osteochondral lesion

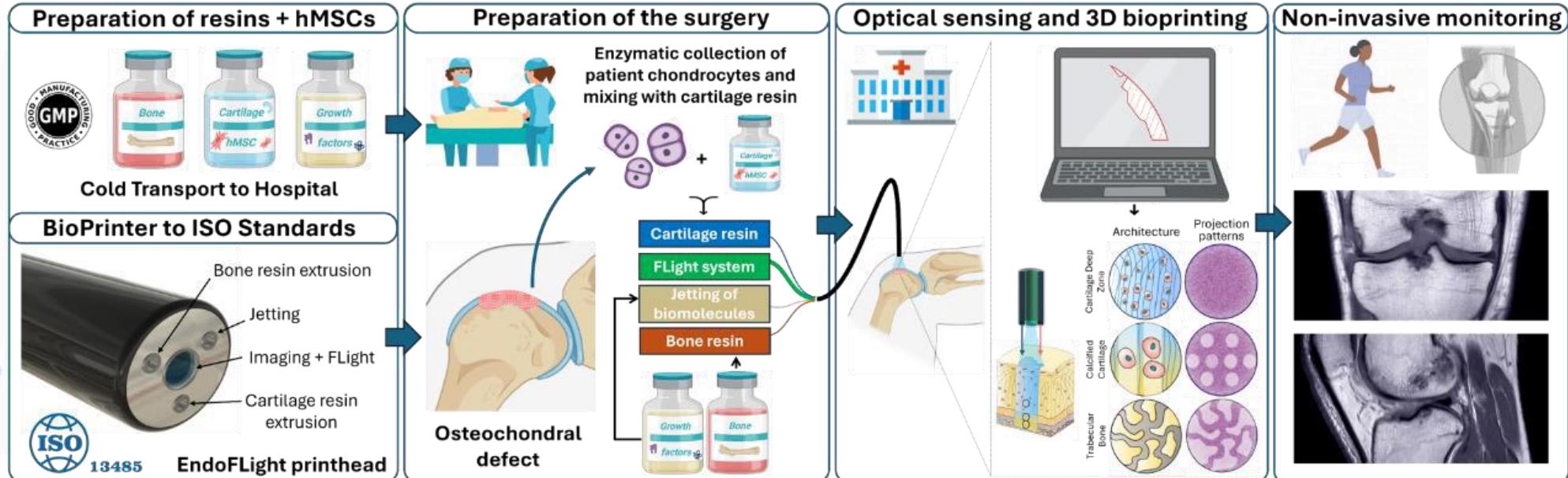
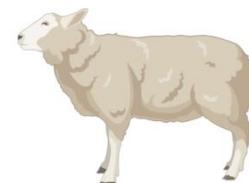
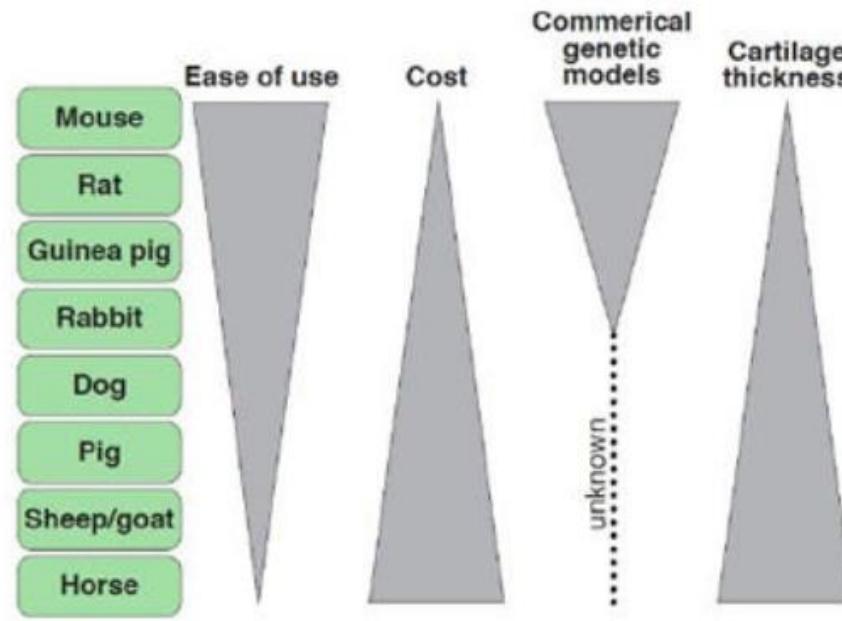
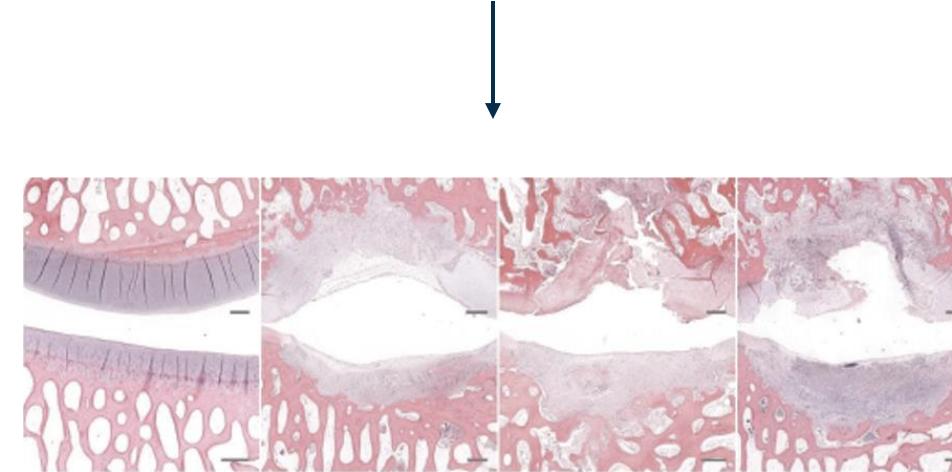


Figure 1.1. Overview of the LUMINATE approach.

Pretklinički animalni model



Treatment

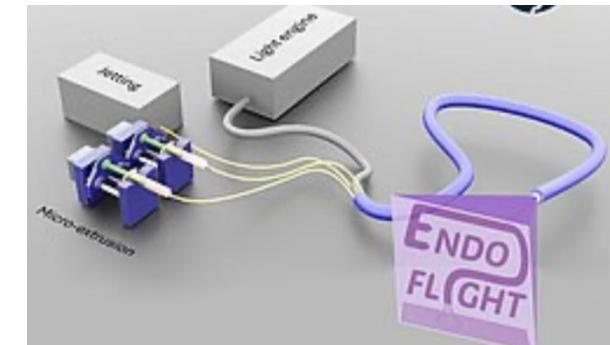
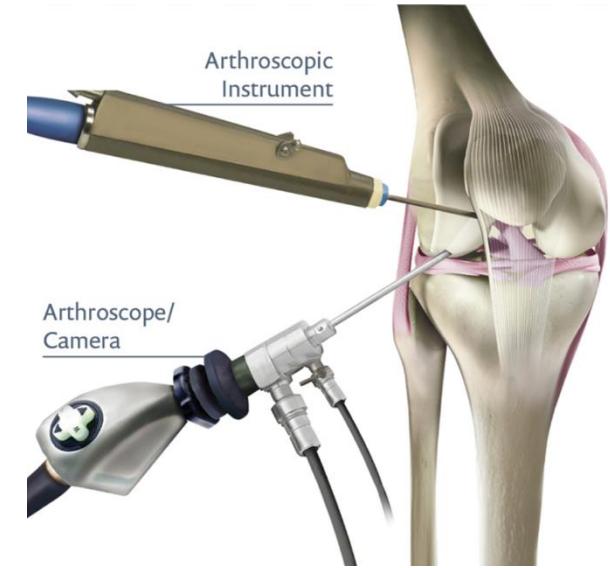


Analysis



Take-home poruka

- LUMINATE predlaže jednokratni regenerativni pristup za liječenje velikih osteohondralnih lezija
- LUMINATE razvija naprednu *in situ bioprinting* jedinicu nazvanu EndoFLight, koja kombinira tri alata (mikro-ekstruziju, filamentirano svjetlo i jetting) za ispis fotoosjetljivih polimera sa stanicama izravno na mjesto ozljede
- Cijela će se procedura opsežno testirati na relevantnom pretkliničkom animalnom modelu
- Razvoj postupka prati analiza tržišta, osnivanje spin-off tvrtke i analiza regulatornih aspekata svih komponenti bioprinting sustava.





Zahvale

Koordinatori projekta:



Prof.dr.sc. Giovanni Vozzi
Interdepartmental Research Center "E.
Piaggio", Faculty of Engineering
University of Pisa



Prof.dr.sc. Marcy Zenobi-Wong
Department of Health Sciences and
Technology
ETH Zürich

The LUMINATE logo is displayed at the top left. To its right is the European Union flag with the text "Funded by the European Union". Below these is a large group photograph of approximately 30 project partners standing outdoors in front of a building.

A photograph of a smaller group of people from the University of Zagreb. Below this is a white rectangular box containing the text "University of Zagreb". At the bottom are three circular logos: the Faculty of Medicine (SVEUCILIŠTE U ZAGREBU MEDICINSKI FAKULTET), the Faculty of Mathematics and Physics (SVEUCILIŠTE U ZAGREBU PRIMIJENOVANO - MATEMATIČKI FAKULTET PMF), and the Faculty of Veterinary Medicine (SVEUCILIŠTE U ZAGREBU VETERinarski FAKULTET SVEUCILIŠTA U ZAGREBU).