

CLAUDIO INTINI

Email: claudio.intini@unica.it

Ph.D, M.Sc, B.Sc

Detail- & Goal-oriented Doctor of Philosophy (Ph.D.) in **Biomedical & Tissue Engineering** with extensive expertise in **orthopaedic medical devices** for musculoskeletal applications. Core competencies in Strategic planning & budgeting, Start-Up Fundraising (500k Euro) with Project management overview skills from *in-vitro* studies to clinical trials with experience in industry and academia. Effective communication skills (oral speaker at **>10 international conferences**). Recognized internationally with the **Scientific Excellence Award 2024** for Young Investigators from the Tissue Engineering Regenerative Medicine International Society (TERMIS) and **New Investigator Recognition Awards** (NIRA) finalist 2025 by the Orthopedic Research Society (ORS).

RESEARCH SKILLS

- 3D/2D Cell Culture (*stem cells, stromal/primary cells, immortalised cell lines - animals/human isolated*): expansion, cryopreservation, cell counting & media optimisation.
- Biomaterial manufacturing and functionalisation (*3D printing, freeze-drying/lyophilisation, nanoparticles/protein encapsulation & drug delivery of specific genetic pDNAs/mRNAs cargos*).
- Materials Science (*mechanical testing, SEM, pore size & porosity assays, HPLC, IR, NMR*).
- Molecular Biology Techniques (*qRT-PCR, Western Blot, IHC, IF, biocompatibility assays, bioassays*).
- Imaging techniques (*brightfield/confocal/fluorescence microscopy, image processing-algorithms*).
- Preclinical models - In-vivo animal models experiences (goats & rats) Clinical data management & analysis.

RESEARCH PRODUCTIVITY Scopus: <https://www.scopus.com/authid/detail.uri?authorId=57203022771>

EDUCATION

Doctor of Philosophy (PhD) in Tissue Engineering and Regenerative Medicine **Apr 2018-Sep 2021**

*Tissue Engineering Research Group, Department of Anatomy,
Royal College of Surgeons in Ireland, Dublin, Ireland*

Thesis: “*Innovative biomimetic collagen-based scaffolds for enhanced and longer lasting cartilage repair*”

Supervisors: Prof. Fergal O’Brien & Dr. John P. Gleeson

Skills: *Collagen-based biomaterials manufacturing – Primary cell culture of human- and rat-derived Stem Cells – Biochemical assays – Cellular Transfection (by non-viral vectors) of micro RNAs and plasmid DNAs – RNA extraction – cDNA preparation – PCR – Histology (immunohistochemistry) – Immunofluorescence – Protein analysis (Western Blot)*

Master of Science (MSc) in Pharmaceutical, Veterinary and Medical Biotechnologies **Oct 2014-Apr 2017**

Center for Innovation in Health Products, University of Parma, Parma, Italy

Thesis: “*Physicochemical and biological characterization of chitosan polymeric 3D structures, for tissue engineering*”

Supervisor: Prof. Ruggero Bettini

Skills: *Chitosan-based biomaterials manufacturing – 3D printing – High Performance Liquid Chromatography (HPLC) – Nuclear Magnetic Resonance and Infrared Spectroscopy (NMR & IR) – Skin Tissue Engineering – Cell culture of human-derived fibroblast & keratinocytes – Biochemical assays*

Bachelor of Science (BSc) in Industrial Biotechnologies for Process and Products **Oct 2010-Mar 2014**

Department of Bioscience, Biotechnology and Biopharmaceutics, University of Bari, Bari, Italy

Thesis: “*Bioconversion of a ketone in a chiral alcohol through whole cell stereoselective bio catalysis using a mini bioreactor ministat*”

Supervisor: Dr. Isabella Pisano

Skills: Basic set up of a bioreactor in batch (Inoculum, cell culture medium, temperature, pH and gas control and sampling) – Biological Enzyme Catalysis (Bacterial) – Bio/Fermentation – Green Chemistry

PROFESSIONAL EXPERIENCE

Researcher Tenure Track (RTT) under the Section of Cytomorphology and Histology **Dec 2024-Current**
Department of Biomedical Sciences, University of Cagliari, Italy

- Lecturer of histological procedures at Dep. Biomedical Science, University of Cagliari of the histology laboratory (Medicine and Surgery degree).
- Lecturer of Histology and Embryology at University of Cagliari (Healthcare Professional's degrees).
- Reports and grants writing with effective projects communication and budgeting to team members.

Visiting Scientist at Tissue Engineering Research Group (TERG) led by Prof. Fergal O'Brien **Dec 2024-Current**
Royal College of Surgeons in Ireland, Department of Anatomy, TERG, Dublin, Ireland

- Actively involved as co-inventor (17% of shares) for a filed patent describing an advanced biomaterial for musculoskeletal tissue repair application developed during my time spent at TERG, RCSI.
- On-going projects and collaborations relative to the development of gene-activate biomimetic scaffolds.
- Recently published as co-author a manuscript to Q1 peer-reviewed journal (Material Today Bio IF: 8.7).
<https://doi.org/10.1016/j.mtbio.2024.101382>

Senior Post-doctoral Researcher (Advanced European Research Council Grant) **Jan 2023-Nov 2024**
under the direction of *Prof. Fergal O'Brien*

Royal College of Surgeons in Ireland, Department of Anatomy, TERG, Dublin, Ireland

- Prototyped, evaluated & manufactured advanced 3D multi-layers mechanically reinforced collagen-based scaffold biomaterials to develop osteochondral medical devices for cartilage/bone regeneration.
- Evaluated & validated *in vivo* with a large animal model (goats) the osteochondral regenerative capacity of these collagen-based scaffolds to heal cartilage/bone damages following 6 months implantation.
- Managed & supervised a multidisciplinary team of researchers, consultants and clinicians, organised/directed scientific meetings and established successful industry collaborations.
- Managed the reports writing and communicated project progress to funding entities and stakeholders.

Post-doctoral Researcher (+5 years project; Advanced European Research Council Grant) **Jul 2021-Dec 2022**
under the direction of *Prof. Fergal O'Brien*

Royal College of Surgeons in Ireland, Department of Anatomy, TERG, Dublin, Ireland

- Prototyped & manufactured an advanced 3D scaffold biomaterial for cartilage tissue regeneration used as platform for drug delivery of therapeutic genetic material (mRNA).
- Developed & characterised this 3D scaffold biomaterial as platform for drug delivery using non-viral peptide-based nanoparticles encapsulating therapeutic microRNA inhibitors.
- Evaluated & validated *in vitro* cell-biomaterial interactions: molecular biology including qRT-PCR, cell-based tissue-specific assays, imaging techniques (histology).
- Published as first author a manuscript to Q1 peer-reviewed journal (Advanced Therapeutics IF: 4.6).
<https://doi.org/10.1002/adtp.202200329>

Visiting Scientist (During the PhD Marie Skłodowska-Curie Actions)

May 2019-Sep 2019

under the direction of *Prof. Gerjo Van Osch*

Erasmus Medical Center, Department of Oral and Maxillofacial Surgery, Rotterdam, The Netherlands

- Validated an “off the shelf” highly porous collagen-based scaffold biomaterial for the repair of cartilage damage and disease *in vitro* using primary cell lines of paediatric human stem cells.
- Characterised and assessed the cartilage regenerative capacity of the biomaterials following human primary stem cells culture by RT-PCR, histological techniques (IF-IHC).
- Shared/communicated know-how with top leader experts in cartilage tissue engineering at Erasmus Medical Center, Rotterdam & established fruitful collaborations with the RCSI team in Dublin.
- Published 1 pioneering manuscripts to Q1 peer-reviewed journal (Biomaterials IF: 12.8, <https://pubmed.ncbi.nlm.nih.gov/34678648/>)

Junior Scientist & Doctor of Philosophy Researcher (Marie Skłodowska-Curie Actions)

Oct 2017-Jul 2021

under the direction of *Prof. Fergal O’Brien* & Dr. John P. Gleeson

Surgacoll Technologies, Dublin, Ireland & Royal College of Surgeons in Ireland, Dublin, Ireland

- Prototyped, evaluated & manufactured an “off the shelf” highly porous collagen-based scaffold biomaterial for the repair of cartilage damage and disease.
- Characterised the physicochemical properties & validated *in vitro* by 2D/3D mammalian cell culture (rat & human primary stem cells) and biological assays.
- Shared/communicated know-how with top leader experts in cartilage tissue engineering (14 high skilled scientists in 9 top-ranked institutions; meetings every 6 months in Europe) & established collaborations.
- Published as first author 2 pioneering manuscripts to Q1 peer-reviewed journals (Bioengineering IF: 3.8, May 2022 <https://doi.org/10.3390/bioengineering9060232> & Biomaterials Science IF:5.8, Jan 2022 DOI: 10.1039/D1BM01417J).

Visiting scientist (During the Overworld funded action)

Oct 2016-Mar 2017

under the direction of *Prof. Michelle McConnell* & *Prof. Jaydee Cabral*

University of Otago, Department of Microbiology & Immunology, Dunedin, New Zealand

- Validated a successfully developed 3D printed chitosan-based scaffold biomaterial (at University of Parma) for skin regeneration *in vitro* using immortalised cell lines of fibroblasts and keratinocytes.
- Characterised and assessed the skin regenerative capacity of the biomaterial following human cells culture by histological techniques and biological assays.
- Shared/communicated know-how at University of Otago with the generation of successful collaborations with the groups (University of Otago-University of Parma).
- Published as first author a pioneering manuscript in Q1 peer-reviewed journal (Carbohydrate Polymers IF:10.7 <https://doi.org/10.1016/j.biomaterials.2021.121187>).

Master of Science Researcher

Nov 2015-Mar 2017

under the direction of *Prof. Ruggero Bettini* & *Prof. Lisa Elviri*

University of Parma, Center for Innovation in Health Products, Department of Pharmacy, Parma, Italy

- Prototyped & manufactured a 3D printed chitosan-based scaffold biomaterial for skin regeneration.
- Characterised by physicochemical analysis including HPLC - NMR - IR (University of Parma).
- Evaluated & validated *in vitro* cell-biomaterial interactions by 2D/3D cell culture (human fibroblasts and keratinocytes) (University of Otago). Generated successful collaborations with the groups.

- Published in Jul 2018 a pioneering manuscript in Q1 peer-reviewed journal (Carbohydrate Polymers IF:10.7 <https://doi.org/10.1016/j.biomaterials.2021.121187> - 187 citations in peer reviewed journals).

Bachelor of Science Researcher

Jan 2014-Mar 2014

under the direction of *Prof. Isabella Pisano*

University of Bari, Department of Bioscience, Biotechnology and Biopharmaceutics, Bari, Italy

- Prototyped an innovative bioreactor in batch for the bioconversion of a ketone in a chiral alcohol by a cell stereoselective biological catalysis (mediated by bacteria).
- Characterised and validated the basis set up of the bioreactor in batch (Inoculum, cell culture medium, sampling) by measuring the temperature, pH, gas control and chemical yield.
- Successfully handled and assessed bacterial cultures of several strains, ending with the selection of the most suitable one for this type of bio-catalysis.

PUBLICATIONS

- An S, **Intini C**, O'Shea D, Dixon JE, Zheng Y, O'Brien FJ. A miR-activated hydrogel for the delivery of a pro-chondrogenic microRNA-221 inhibitor as a minimally invasive therapeutic approach for articular cartilage repair. *Mater Today Bio* **30**, 101382, (2025).
- Intini C** #, Liu Y #, Dobricic M, O'Brien FJ, Llorca J, Echeverry-Rendon M. Biomimetic collagen-based 3D printed poly (glycerol sebacate) composite scaffolds to enhance cartilage defect repair. *International Journal of Biological Macromolecules*. Volume 280, Part 2, 135827, (2024).
- Joyce M, Hodgkinson T, **Intini C**, Dixon JE, Kelly DJ, O'Brien FJ. Gene activated reinforced scaffolds for Sox9 delivery to enhance repair of large load bearing articular cartilage defects. *Eur Cells Mater*. (2024).
- Intini C**, Ferreras LB, Casey S, Dixon JE, Gleeson JP, O'Brien FJ. An Innovative miR-Activated Scaffold for the Delivery of a miR-221 Inhibitor to Enhance Cartilage Defect Repair. *Adv. Ther.* **6**, (2023).
- Intini C**, Hodgkinson T, Casey SM, Gleeson JP, O'Brien FJ. Highly Porous Type II Collagen-Containing Scaffolds for Enhanced Cartilage Repair with Reduced Hypertrophic Cartilage Formation. *Bioengineering* **9**, 232 (2022).
- Intini C**, Lemoine M, Hodgkinson T, Casey S, Gleeson J, O'Brien FJ. A highly porous type II collagen containing scaffold for the treatment of cartilage defects enhances MSC chondrogenesis and early cartilaginous matrix deposition. *Biomater. Sci.* (2022).
- Andrés Sastre E, Nossin Y, Jansen I, Kops N, **Intini C**, Witte-Bouma J, et al. A new semi-orthotopic bone defect model for cell and biomaterial testing in regenerative medicine. *Biomaterials* **279**, 121187 (2021).
- Intini C**, Elviri L, Cabral J, Mros S, Bergonzi C, Bianchera A, et al. 3D-printed chitosan-based scaffolds: An in vitro study of human skin cell growth and an in-vivo wound healing evaluation in experimental diabetes in rats. *Carbohydr. Polym.* **199**, 593–602 (2018).

CONFERENCE ACTIVITY

- Oral talk.** Orthopedic Research Society (ORS) 2025. New Investigator Recognition Awards (NIRA) finalist. Globally recognized award for early career researchers in orthopedics. United States **7-11 Feb 2025**
- Poster.** Workshop on Additive Biofabrication (WAB) 2024. Madrid, Spain **25-27 Sep 2024**
- Oral talk.** TERMIS World Congress 2024. Awarded: Scientific Excellence Award for Young Investigators (SYIS). Globally recognized award for scientific excellences in the field of tissue engineering and regenerative medicine for early career researchers. Seattle, Washington, United States **25-28 Jun 2024**
- Poster.** Orthopedic Research Society (ORS) 2024. Long Beach, California, United States **2-6 Feb 2024**
- Oral talk.** European Society of Biomaterials (ESB) 2023. Davos, Switzerland **4-8 Sep 2023**
- Oral talk.** TERMIS European Chapter 2023. Manchester, United Kingdom **28-31 Mar 2023**
- Oral talk.** Orthopedic Research Society (ORS) 2023. Dallas, Texas, United States **10-14 Feb 2023**
- Oral talk.** Bioengineering in Ireland 2022. Galway, Ireland **20-21 May 2022**
- Oral talk.** Orthopedic Research Society (ORS) 2022. Tampa, Florida, United States **4-8 Feb 2022**
- Poster.** TERMIS World Congress 2021. Virtual **15-19 Nov 2021**
- Poster.** European Society of Biomaterials (ESB) 2021. Virtual **5-9 Sep 2021**

- **Oral talk.** World Biomaterials Conference (WBC) 2020. Glasgow, Scotland (Virtual) **11-16 Dec 2020**
- **Oral talk.** Bioengineering in Ireland 2020. Co Carlow, Dublin, Ireland **Jan 2020**
- **Oral talk.** TERMIS European Chapter 2019. Rhodes, Greece **27-31 May 2019**
- **Oral talk.** Bioengineering in Ireland 2018. Limerick, Ireland **Jan 2019**
- **Oral talk.** D4 Diagnostic, Drug, Device and Discovery. Dunedin, New Zealand **23-24 Nov 2016**

ACHIEVEMENTS, LEADERSHIP ROLES & ADDITIONAL COURSES

Awards (Grants) and Honours:

- **Award:** Top 10 Most-Cited Article *Intini et al., 2023*, published by *Advanced Therapeutics* **Mar 2025**
- **Award:** New Investigator Recognition Awards (NIRA) finalist, Pheonix, United States **Feb 2025**
- **Inventor:** 17% of shares for a filed patent to the Office of Research and Innovation (ORI) at RCSI. **Jan 2025**
- **Award:** Scientific Excellence Award for Young Investigators (SYIS), Seattle, United States **Jun 2024**
- **500.000€** Funding: SFI Accelerating Research to Commercialisation, RCSI, Dublin, Ireland **Apr 2024**
- **2500€** Funding: Charlemont Grant 2022 by Royal Irish Academy), RCSI, Dublin, Ireland **Nov 2023**
- **Marie Curie Early-Stage Researcher PhD fellowship**, SurgaColl Technologies, Dublin, Ireland
<https://cordis.europa.eu/project/id/721432> **Sep 2019**
- **2500€** Funding **Overworld “Overseas Student Exchange”**, University of Parma, Parma, Italy **Oct 2016**
- **Gaetano Marzotto award** Project: “WRAP-Wound Repair Active Print”, University of Parma, Italy **Dec 2016**

Leadership (Lecturer) Roles: Lecturer of Histology at University of Cagliari (healthcare professional’s degrees) – Lecturer at Dep. Biomedical Science, University of Cagliari of the histology laboratory (Medicine and Surgery degree) – Member of Collegio dei Docenti di Istologia ed Embriologia Umana, Italy – Lecturer of cartilage & bone tissue engineering and member of TERG, RCSI lab at Regeneu Consortium <https://regeneu.com.tr/project-team/> – Manager and lecturer at Dep. Anatomy, RCSI of the histology laboratory – Member of Orthopaedic Research Society (ORS) – Member of Tissue Engineering Regenerative Medicine International Society (TERMIS) - Member of TCBE (Trinity Center for Biomedical Engineering) seminar series committee – Supervisor at RCSI for several post-graduate, MSc, BSc students – Member of RCSI Postdoctoral Society – Member of RCSI Department of Anatomy Athena Swan Bronze Award Committee.

Additional Courses: Innovation Training (Maximising the societal and economic impact of your research) - RCSI; Critical Analysis, Writing & Communication Skills - RCSI; Biostatistics for Research Postgraduates - RCSI; General Data Protection Regulation - RCSI; Unconscious Bias - RCSI; Security Awareness Training - KnowBe4; Laboratory Safety - RCSI; Laboratory Animal Science and Training Certificate (LAST) for UK and IE.

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