

## PERSONAL INFORMATION

## Marco Angelozzi

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Sex M | Date of birth 16/10/1989 | Nationality Italian

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## WORK EXPERIENCE

July 2022 – Present

**Research Associate Scientist II**

At Children's Hospital of Philadelphia in the laboratory of Dr. Veronique Lefebvre.

- Study of the molecular regulation of bone and cartilage development.
- Development of a gene therapy for achondroplasia.

July 2018 – July 2022

**Postdoctoral Fellow**

At Children's Hospital of Philadelphia in the laboratory of Dr. Veronique Lefebvre.

- Study of the role of SOXC transcription factors in skeleton formation and maintenance.
- Study of genetic diseases associated to SOX genes (SOXopathies).

November 2017 – June 2018

**Postdoctoral Fellow**

At Cleveland Clinic in the laboratory of Dr. Veronique Lefebvre.

- Study of the role of SOXC transcription factors in skeleton formation and maintenance.

March 2017 – November 2017

**Postdoctoral Fellow**

At the Urological Research Institute of San Raffaele Hospital and virology laboratory of Prof. Peggy Marconi at University of Ferrara.

- Preparation of HSV-based vectors for the European project ELPIS: "Emergence of a spinal micturition reflex after SCI: abolition by silencing of hyper-excited C-fiber bladder afferents by gene therapy to restore continence and micturition".

## EDUCATION AND TRAINING

January 2014 – December 2016

**PhD in Biomedical Sciences and Biotechnology**

At University of Ferrara in the laboratory of Prof. Roberta Piva.

- Research activity on bone and cartilage molecular biology with the production of the experimental thesis "Cell-based models for bone and cartilage tissue engineering: in vitro investigations from a biomaterialistic, cellular and molecular perspective".  
Tutor: Prof. Monica Borgatti; Supervisor: Prof. Roberta Piva

October 2015 – December 2015

**Visiting PhD student**

At International Centre for Genetic Engineering and Biotechnology (ICGEB) in the Molecular Medicine Laboratory of Prof. Mauro Giacca.

- RNA-seq analysis of human mesenchymal stem cells and set up of an in vitro screening system for chondrogenic molecules.

July 2013

**Second level degree in Biomolecular and Cellular Sciences**

At University of Ferrara

- Experimental thesis: "Composite biomaterials for cell encapsulation: application to the tissue engineering of bone and cartilage".  
Supervisors: Prof. Claudio Nastruzzi and Prof. Roberta Piva.  
Marks of 110/110 cum laude.

#### July 2011 Bachelor's degree in Biotechnology

At University of Ferrara

- Experimental thesis: "Cell encapsulation protocols with composite biomaterials".  
Supervisors: Prof. Claudio Nastruzzi and Prof. Maria Roberta Piva.  
Marks of 110/110 cum laude.

#### July 2008 High School Diploma

At "Istituto Magistrale E. Trebbiani", Ascoli Piceno. Marks of 100/100 cum laude.

#### May 2007 Leonardo da Vinci Project

At Londonderry, Northern Ireland.

- English course and professional stage at North West Academy of English.

### PERSONAL SKILLS

#### Mother tongue(s)

Italian

#### Other languages

English: advanced knowledge  
French: basic knowledge

#### Job-related skills

- Management of a colony of 200-300 mice
- Ex-vivo procedures on mice for bone and cartilage biological and molecular analysis
- In vivo intraperitoneal injections in mice
- Ex-vivo and in vitro cell culture for human and murine cell lines, in particular osteoblasts, chondrocytes and mesenchymal stem cells (MSCs) from umbilical cord or bone marrow
- Single-cell RNA-seq analysis with Seurat, Monocle and RnAvelocity packages
- Development of 3D cell culture systems and use of the Rotary Cell Culture System (Synthecon) equipped with HARV vessels
- Cell encapsulation procedures with different types of biomaterials (i.e., alginate, decellularized matrices, gelatin, bioglass)
- Procedures for osteogenic and chondrogenic differentiation
- Molecular analysis: gene expression by PCR and qRT-PCR; Western Blot; immunohistochemistry and immunocytochemistry; luciferase assay; cell viability and proliferation assays; chromatin immunoprecipitation (ChIP) assay; embedding procedures for transmission electron microscopy (TEM)
- Isolation of mitochondria from immortalized cell lines and human MSCs
- Transient transfection of expression plasmids and small oligonucleotides (i.e., siRNAs or antisense microRNAs)
- Cell transduction with adeno-, adeno-associated and herpes simplex viral vectors
- Cloning procedures, bacterial transformation and plasmid preparation
- Preparation of Herpes Simplex Virus (HSV) based vectors for gene therapy through BAC technology
- Sample and library preparation and following bioinformatics analysis for RNA-seq and ChIP-seq

#### Digital skills

PCs running Microsoft Windows, MS-DOS, Word, Excel, Power point, Adobe Acrobat Writer, Adobe Photoshop, GraphPad Software, Kaleidagraph Software, ImageJ, Strand-NGS Software, Loupe Cell Browser Software from 10X Genomics, R and RStudio, Seurat, Monocle, Velocity, scVelo, Python

#### Personal profile

Quick-minded with good team-working skills.  
Open to new working experiences and professional improvement.  
I like to meet people of different cultural and scientific background.

#### Driving licence

B

## ADDITIONAL INFORMATION

## Publications

**Angelozzi M\***, Karvande A and Lefebvre V. "SOXC are critical regulators of adult bone mass". Nature Communications. 2024; manuscript accepted for publication. \*co-first and co-corresponding author.

Molin A, Contentin R, **Angelozzi M**, Karvande A, Kc R, Haseeb A, Voskamp C, de Charleroy C, and Lefebvre V. "Skeletal growth is enhanced by a shared role for SOX8 and SOX9 in promoting reserve chondrocyte commitment to columnar proliferation". Proc Natl Acad Sci U S A. 2024; 121(8):e2316969121.

Ji X, Seeley R, Li K, Song F, Liao X, Song C, **Angelozzi M**, et al. "Genetic activation of glycolysis in osteoblasts preserves bone mass in type I diabetes". Cell Chem Biol. 2023; S2451-9456(23)00231-3.

**Angelozzi M**, Pellegrino da Silva R, Gonzalez MV and Lefebvre V, "Single-cell atlas of craniogenesis uncovers SOXC-dependent, highly proliferative, and myofibroblast-like osteodermal progenitors". Cell Rep, 2022; 40(2):111045.

Doke T, Abedini A, Aldridge DL, Yang YW, Park J, Hernandez CM, Balzer MS, Shrestha R, Coppock G, Rico JMI, Han SY, Kim J, Xin S, Piliipovsky AM, **Angelozzi M**, et al., "Single-cell analysis identifies the interaction of altered renal tubules with basophils orchestrating kidney fibrosis". Nat Immunol, 2022; 23(6):947-959.

**Angelozzi M**, Karvande A, Molin AN et al., "Consolidation of the clinical and genetic definition of a SOX4- related neurodevelopmental syndrome". J Med Genet, 2022; 59(11):1058-1068.

Jones K, **Angelozzi M\***, Ganishetti U, Haseeb A, de Charleroy C, Lefebvre V and Bhattaram P, "Human adult fibroblast-like synoviocytes and articular chondrocytes exhibit prominent overlap in their transcriptomic signatures". ACR Open Rheumatol. 2021; 3(6):359-370. \*co-first author.

Haseeb A, Kc R, **Angelozzi M**, de Charleroy C, Rux D, Tower RJ, Yao L, Pellegrino da Silva R, Pacifici M, Qin L and Lefebvre V, "SOX9 keeps growth plates and articular cartilage healthy by inhibiting chondrocytes dedifferentiation/osteoblastic redifferentiation". Proc Natl Acad Sci U S A, 2021; 118(8):e2019152118.

**Angelozzi M**, de Charleroy CR and Lefebvre V, "EdU-based assay of cell proliferation and stem cell quiescence in skeletal tissue sections". Methods Mol Biol, 2021; 2230:357-365.

Tolchin D, Yeager JP, Prasad P, Dorrani N, Russi AS, Martinez-Agosto JA, Haseeb A, **Angelozzi M**, et al., "De novo SOX6 variants cause a neurodevelopmental syndrome associated with ADHD, craniosynostosis and osteochondromas". Am J Hum Genet, 2020; 106(6):830-845.

Lefebvre V, **Angelozzi M** and Haseeb A, "SOX9 in cartilage development and disease". Curr Opin Cell Biol, 2019; 61:39-47.

**Angelozzi M** and Lefebvre V, "SOXopathies: a growing family of developmental disorders due to SOX mutations". Trends Genet, 2019; 35(9):658-671.

Lambertini E, Penolazzi L, **Angelozzi M**, Bergamin LS, Manfredini C, Vieceli Dalla Sega F, Paoletta F, Lisignoli G and Piva R, "Hypoxia preconditioning of human MSCs: a direct evidence of HIF-1 $\alpha$  and collagen type XV correlation". Cell Physiol Biochem, 2018; 51(5):2237-2249.

Liu CF, **Angelozzi M**, Haseeb A and Lefebvre V, "SOX9 is dispensable for the initiation of epigenetic remodeling and the activation of marker genes at the onset of chondrogenesis". Development, 2018; 145(14).

Lambertini E, Penolazzi L, **Angelozzi M**, Grassi F, Gambari L, Lisignoli G, De Bonis P, Cavallo M and Piva R, "The expression of cystathionine gamma-lyase is regulated by estrogen receptor alpha in human osteoblasts". Oncotarget, 2017; 8(60):101686-101696.

**Angelozzi M**, Penolazzi L, Mazzitelli S, Lambertini E, Lolli A, Piva R and Nastruzzi C, "Dedifferentiated Chondrocytes in composite microfibers as tool for cartilage repair". Front Bioeng Biotechnol, 2017; 5:35.

Mandatori D, Penolazzi L, Pipino C, Di Tomo P, Di Silvestre S, Di Pietro N, Trevisani S, **Angelozzi M**, Ucci M, Piva R and Pandolfi A, "Menaquinone-4 enhances osteogenic potential of human amniotic fluid mesenchymal stem cells cultured in 2D and 3D dynamic culture systems". J Tissue Eng Regen Med, 2018; 12(2):447-459.

Lisignoli G, Lambertini E, Manfredini C, Gabusi E, Penolazzi L, Paoletta F, **Angelozzi M**, Casagrande V and Piva R, "Collagen type XV and the 'osteogenic status'". J Cell Mol Med, 2017; 21(9):2236-2244.

Penolazzi L, Lolli A, Sardelli L, **Angelozzi M**, Lambertini E, Trombelli L, Ciarpella F, Vecchiatini R and Piva R, "Establishment of a 3D-dynamic osteoblasts-osteoclasts co-culture model to simulate the jawbone microenvironment in vitro". *Life Sci*, 2016; 152:82-93.

Lolli A, Narcisi R, Lambertini E, Penolazzi L, **Angelozzi M**, Kops N, Gasparini S, van Osch GJ and Piva R, "Silencing of antichondrogenic microRNA-221 in human mesenchymal stem cells promotes cartilage repair in vivo". *Stem Cells*, 2016; 34(7):1801-11.

**Angelozzi M**, Miotto M, Penolazzi L, Mazzitelli S, Keane T, Badylak SF, Piva R and Nastruzzi C, "Composite ECM-alginate microfibers produced by microfluidics as scaffolds with biomineralization potential". *Mater Sci Eng C Mater Biol Appl*, 2015; 56:141-53.

Lambertini E, Penolazzi L, Morganti C, Lisignoli G, Zini N, **Angelozzi M**, Bonora M, Ferroni L, Pinton P, Zavan B and Piva R, "Osteogenic differentiation of human MSCs: Specific occupancy of the mitochondrial DNA by NFATc1 transcription factor". *Int J Biochem Cell Biol*, 2015; 64:212-9.

Piva R, Lambertini E, Manferdini C, Capanni C, Penolazzi L, Gabusi E, Paoletta F, Lolli A, **Angelozzi M**, Lattanzi G and Lisignoli G, "Slug transcription factor and nuclear Lamin B1 are upregulated in osteoarthritic chondrocytes". *Osteoarthritis Cartilage*, 2015; 23(7):1226-30.

Vecchiatini R, Penolazzi L, Lambertini E, **Angelozzi M**, Morganti C, Mazzitelli S, Trombelli L, Nastruzzi C and Piva R, "Effect of dynamic three-dimensional culture on osteogenic potential of human periodontal ligament-derived mesenchymal stem cells entrapped in alginate microbeads". *J Periodontal Res*, 2015; 50(4):544-53.

Lolli A, Lambertini E, Penolazzi L, **Angelozzi M**, Morganti C, Franceschetti T, Pelucchi S, Gambari R and Piva R, "Pro-chondrogenic effect of miR-221 and slug depletion in human MSCs". *Stem Cell Rev*, 2014; 10(6):841-55.

Lisignoli G, Manferdini C, Lambertini E, Zini N, **Angelozzi M**, Gabusi E, Gambari L, Penolazzi L, Lolli A, Facchini A and Piva R, "Chondrogenic potential of Slug-depleted human mesenchymal stem cells". *Tissue Eng Part A*, 2014; 20(19-20):2795-805.

#### Scientific meetings

- Bones and Teeth Gordon Research Conference, 2024 Galveston (TX), USA.
- 19<sup>th</sup> Annual Symposium of the Penn Center for Musculoskeletal Disorders, 2022 Philadelphia (PA), USA.
- Bones and Teeth Gordon Research Conference, 2022 Ventura (CA), USA.
- Bones and Teeth Gordon Research Seminar, 2022 Ventura (CA), USA.
- Bones and Teeth Gordon Research Conference, 2020 Galveston (TX), USA.
- Bones and Teeth Gordon Research Seminar, 2020 Galveston (TX), USA.
- 16<sup>th</sup> Annual Symposium of the Penn Center for Musculoskeletal Disorders, 2019 Philadelphia (PA), USA.
- 5<sup>th</sup> International SOX Research Conference, 2019 L'isle-sur-la-sorgue, France
- 15<sup>th</sup> Annual Symposium of the Penn Center for Musculoskeletal Disorders, 2018 Philadelphia (PA), USA.
- American Society for Bone and Mineral Research (ASBMR) Meeting, 2018 Montreal, Canada.
- 7th Meeting Stem Cell Research Italy Society, 2016 Bologna, Italy.
- 56th Annual meeting of the Italian Cancer Society (SIC): "Dangerous Liaisons: translating cancer biology into better patient management", 2014 Ferrara, Italy.
- World Conference on Regenerative Medicine, 2013 Leipzig, Germany.
- 2nd Annual Workshop (EPIXCHANGE): "Gene and cell therapy for brain diseases", 2013 Ferrara, Italy.
- 57th National Meeting of the Italian Society of Biochemistry and Molecular Biology, 2013 Ferrara, Italy.
- Meeting CIB: "MicroRNA: from basic research to therapeutic applications", 2013 Ferrara, Italy.
- 1st THALAMOSS (THALAssaemia Modular Stratification System for personalized therapy of beta-thalassaemia) Scientific Meeting, 2013 Ferrara, Italy.

#### Oral communications

**Angelozzi M**, "SOX4 inhibits trabecular bone formation in adult mice". Bones and Teeth Gordon Research Seminar, 2022 Ventura (CA), USA.

**Angelozzi M**, "Key roles for SOXC transcription factors in skeletogenesis". Seminar for Emerging Innovators in Collaborative Research Series at Children's Hospital of Philadelphia, 2022, Philadelphia (PA), USA.

**Angelozzi M**, "Single-cell transcriptomics uncovers key roles for SOXC transcription factors in craniogenesis". Seminar for the Stem Cell Club for the Institute of Regenerative Medicine at

University of Pennsylvania, 2021, Philadelphia (PA), USA.

**Angelozzi M**, "Key roles for SOXC transcription factors in calvariogenesis". Seminar for the Orthopaedic Research Club at University of Pennsylvania, 2020, Philadelphia (PA), USA.

**Angelozzi M, Bhattaram P, Ashraf S, Karvande A, Mata F, Gonzalez M, Pellegrino R and Lefebvre V**, "Intramembranous bone formation critically relies on SOXC expression in progenitor cells". 5<sup>th</sup> International SOX Research Conference, 2019 L'isle-sur-la-sorgue, France

**Angelozzi M**, "The role of SOXC transcription factors in bone development". Seminar at University of Ferrara, 2019 Ferrara, Italy

**Angelozzi M, Penolazzi L, Lambertini E, Trevisani S, Casagrandra V, Sardelli L, Lolli A, Vecchiatini R, Ferrari L, Nastruzzi C and Piva R**, "Development of 3D stem cell culture systems: one step closer to natural conditions". 7th Meeting Stem Cell Research Italy Society, 2016, Bologna, Italy.

**Angelozzi M, Penolazzi L, Lolli A, Lambertini E, Morganti C, Di Ciano M, Pedriali N, Mazzitelli, Piva R and Nastruzzi C**. "Development of composite microfibrinous scaffolds for the encapsulation of osteochondroprogenitors: a promising approach for bone and cartilage tissue engineering". World Conference on Regenerative Medicine, 2013 Leipzig, Germany

**Angelozzi M, Penolazzi L, Lolli A, Lambertini E, Morganti C, Di Ciano M, Pedriali N, Mazzitelli, Piva R and Nastruzzi C**, "Optimization of human cell primary culture conditions in biocomposite scaffolds for bone and cartilage tissue engineering". 57th National Meeting of the Italian Society of Biochemistry and Molecular Biology (SIB), 2013 Ferrara, Italy.

#### Awards

- Best poster award at 19<sup>th</sup> Annual Symposium of the Penn Center for Musculoskeletal Disorders, 2022 Philadelphia (PA), USA.
- Recognition as "Emerging Innovators in Collaborative Research" at CHOP Research Institute, 2022 Philadelphia (PA), USA.
- Best poster award at the Bones and Teeth Gordon Research Conference, 2020 Galveston (TX), USA.
- 3<sup>rd</sup> prize as best poster at 16<sup>th</sup> Annual Symposium of the Penn Center for Musculoskeletal Disorders, 2019 Philadelphia (PA), USA.
- Best PhD Thesis in Biomedical Sciences and Biotechnology 2017, University of Ferrara

#### Memberships

Stem Cell Research (SCR) Italy  
Italian Cancer Society (SIC)  
National Postdoctoral Association (NPA)

#### Other activities

- Participated in the inaugural NIH R25-funded CHOP Data and Analytics for Research Training (DART) pilot program:
- Engaged in self-directed and cohort-based learning in data science techniques, including instruction in R, and SQL.
  - Learned fundamentals of promoting rigor and reproducibility in research, including proper data management and version control.
  - Actively provided feedback on pilot program rollout to support future module users.