

## CURRICULUM VITAE

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### Education and Qualifications

- 1<sup>st</sup> October 2012 - current: Postdoctoral fellow at the Laboratory for Orthopaedic Pathophysiology and Regenerative Medicine, Istituto Ortopedico Rizzoli, Bologna, Italy.
- 22<sup>nd</sup> August 2011 – 21<sup>st</sup> August 2012: Postdoctoral fellow in Dr. Kalajzic's lab, Department of Reconstructive Sciences, University of Connecticut Health Center, Farmington, CT, USA.
- January 2011 - June 2011: 6 months fellowship, Department of Biochemistry and Molecular Biology, Section of Molecular Biology, University of Ferrara, Italy.
- 14<sup>th</sup> March 2011: PhD in Pharmacology and Molecular Oncology at the University of Ferrara, Italy. Thesis title: "*Osteogenic differentiation: a novel role of Slug protein*". Supervisor: Prof. Roberta Piva. Judgment: Excellent.
- 18<sup>th</sup> March 2010 – 12<sup>th</sup> April 2010: attendance of Dr. Kalajzic's lab, in the Department of Reconstructive Sciences, University of Connecticut Health Center, Farmington, CT, USA, in relation to Start-up 2009 project.
- July 2008: Trade practice qualification for biologist.
- January 2008: PhD Course, Pharmacology and molecular oncology, oncology curricula, Department of Biochemistry and Molecular Biology, Section of Molecular Biology, University of Ferrara, Italy.
- September 2007-December 2007: 4 months fellowship for project: "*Le neoplasie del cavo orale: analisi dell'espressione dei recettori per gli ormoni sessuali*", Department of Biochemistry and Molecular Biology, Section of Molecular Biology, University of Ferrara, Italy.

- July 2007: Biomolecular and Cellular Sciences Second Level Degree, University of Ferrara, Italy; Discussion about thesis theme: *“Il promotore F del gene hER alpha: caratterizzazione dei siti di riconoscimento per proteine della famiglia AP-1”*.  
Chairman: Prof. Roberta Piva.  
Vote: 110/110 cum laude.
- July 2006 - July 2007: Professional training, Department of Biochemistry and Molecular Biology, Section of Molecular Biology, University of Ferrara, Italy.
- November 2005 - November 2006: 12 months fellowship for project: *“Le neoplasie del cavo orale: analisi dell’espressione dei recettori per gli estrogeni, il progesterone e l’androgeno”*. Department of Biochemistry and Molecular Biology, Section of Molecular Biology, University of Ferrara, Italy.
- October 2005: Biomolecular Sciences First Level Degree, University of Ferrara, Italy. Discussion about thesis theme: *“La tecnica dell’immunoprecipitazione della cromatina (ChIP) per l’analisi dell’interazione DNA-proteine”*.  
Chairman: Prof. Roberta Piva.  
Vote: 110/110 cum laude.
- April 2005 - October 2005: Professional training, Department of Biochemistry and Molecular Biology, Section of Molecular Biology, University of Ferrara, Italy.
- July 2002: Liceo “A. Roiti”- Ferrara, Italy. Scientific Secondary School Certification.

## **Languages**

- Spoken: Italian, English  
Written: Italian, English

## **Training courses**

- December 2012: *“Approcci bioinformatici per l’analisi degli array d’espressione”*, Istituto Ortopedico Rizzoli.
- July 2008: PhD student first level course *“L’apporto delle biotecnologie nello sviluppo di nuove strategie terapeutiche”*, University of Urbino.
- June 2008: Preparation course for the state exam for biologist.
- December 2006: Student course *“La rete dell’Alta Tecnologia dell’Emilia Romagna. I laboratori. I laboratori a rete e gli Spin Off della provincia di Ferrara”*.

## Awards

- 2012 ASBMR Young Investigator Travel Grant Award” at the ASBMR 2012 Annual Meeting, Minneapolis, Minnesota, USA.
- 2012 ASBMR Young Investigator Award at the 2012 Topical Meeting on Bone and Skeletal Muscle Interactions at Kansas City, Missouri, USA.
- 2012 Stem Cell Research Italy Young Investigator Award at the 2012 Stem Cell Research Italy International Society for Cellular Therapy-Europe AICC joint meeting at Ferrara, Italy.

## Publications

- *Exosomes: novel effectors of human platelet lysate activity.*  
**Torreggiani E**, Perut F, Roncuzzi L, Zini N, Baglio SR, Baldini N.  
Eur Cell Mater. 2014 Sep 22;28:137-51.
- *Preosteocytes/Osteocytes have the potential to dedifferentiate becoming a source of osteoblasts.*  
**Torreggiani E**, Matthews BG, Pejda S, Matic I, Horowitz MC, Grcevic D, Kalajzic I.  
PLoS One. 2013 Sep 6;8(9):e75204. doi: 10.1371/journal.pone.0075204.
- *Chondrogenic potential of human mesenchymal stem cells and expression of Slug transcription factor.*  
Brini AT, Niada S, Lambertini E, **Torreggiani E**, Arrigoni E, Lisignoli G, Piva R.  
J Tissue Eng Regen Med. 2013 Jul 21. doi: 10.1002/term.1772.
- *Utilization of transgenic models in the evaluation of osteogenic differentiation of embryonic stem cells.*  
Repic D, **Torreggiani E**, Franceschetti T, Matthews BG, Ivcevic S, Lichtler AC, Grcevic D, Kalajzic I.  
Connect Tissue Res. 2013 Aug; 1-9. doi:10.3109/03008207.2013.814646.
- *In vitro and in vivo approaches to study osteocyte biology.*  
Kalajzic I, Matthews G.B, **Torreggiani E**, Harris M.A, Divieti Pajevic P, Harris S.E.  
Bone. 2013 Jun;54(2):296-306. doi: 10.1016/j.bone.2012.09.040.
- *Changes In Bone Sclerostin Levels In Mice After Ovariectomy Vary Independently Of Changes In Serum Sclerostin Levels.*  
Jastrzebski S, Kalinowski J, Stolina M, Mirza F, **Torreggiani E**, Kalajzic I, Lee S.K, Lorenzo J.  
Journal of Bone and Mineral Research. 2013 Mar;28(3):618-26. doi: 10.1002/jbmr.1773.
- *Human mesenchymal stem cells seeded on extracellular matrix scaffold: viability and osteogenic potential.*  
Penolazzi L, Mazzitelli S, Vecchiatini R, **Torreggiani E**, Lambertini E, Johnson S, Badylak S.F, Piva R, Nastruzzi C.

Journal of Cellular Physiology. 2012 Feb;227(2):857-66. doi: 10.1002/jcp.22983.

- *Role of Slug transcriptional factor in human mesenchymal stem cells.*  
**Torreggiani E**, Lisignoli G, Manferdini C, Lambertini E, Penolazzi L, Vecchiatini R, Gabusi E, Chieco P, Facchini A, Gambari R, Piva R.  
Journal of Cellular and Molecular Medicine. 2011 Jun. doi: 10.1111/j.1582-4934.2011.01352.x.
- *Transcription factor decoy against NFATc1 in human primary osteoblasts.*  
Penolazzi L, Lisignoli G, Lambertini E, **Torreggiani E**, Manferdini C, Vecchiatini R, Ciardo F, Lolli A, Gabusi E, Facchini A, Gambari R, Piva R.  
International Journal of Molecular Medicine. 2011 Aug; 28(2): 199-206. doi: 10.3892/ijmm.2011.701.
- *Slug contributes to the regulation of CXCL12 expression in human osteoblasts.*  
Piva R, Manferdini C, Lambertini E, **Torreggiani E**, Penolazzi L, Gambari R, Pastore A, Pelucchi S, Gabusi E, Piacentini A, Filiardo G, Facchini A, Lisignoli G.  
Experimental Cell Research. 2011 May; 317(8): 1159-168. doi: 10.1016/j.yexcr.2010.12.011.

## **Meeting presentations**

- **Torreggiani E**, Perut F, Roncuzzi L, Baldini N. "Platelet lysate-derived exosomes as a new nanodelivery system for bone regeneration". 10<sup>th</sup>-11<sup>th</sup> October 2014. "IORS", Ferrara, Italy. ORAL PRESENTATION.
- **Torreggiani E**. "Nanosized microvesicles as delivery systems for regenerative medicine". 4<sup>th</sup>-6<sup>th</sup> June 2014. "EFORT", London, UK. ORAL PRESENTATION.
- **Torreggiani E**, Perut F, Roncuzzi L, Baldini N. "Exosomes derived from human platelet lysate affect MSC functions *in vitro*". 17<sup>th</sup>-20<sup>th</sup> May 2014. "ECTS", Prague, Czech Republic. POSTER PRESENTATION.
- **Torreggiani E**, Perut F, Roncuzzi L, Baglio SR, Baldini N. "Exosomes derived from human platelet lysate affect MSC functions *in vitro*". 30<sup>th</sup> April-3<sup>rd</sup> May 2014. "ISEV", Rotterdam, Netherlands. POSTER PRESENTATION.
- Matthews B, **Torreggiani E**, Grcevic D, Kalajzic I. "Characterization of cells that contribute to heterotopic ossification in muscle". 15<sup>th</sup>-18<sup>th</sup> March 2014. "ORS 2014 Annual Meeting", New Orleans, Louisiana, USA. POSTER PRESENTATION.
- **Torreggiani E**, Perut F, Roncuzzi L, Baldini N. "Exosomes derived from human platelet lysate induce MSC proliferation *in vitro*". 13<sup>th</sup>-16<sup>th</sup> October 2013. "8th tri-annual Combined Meeting of Orthopaedic Research Societies", San Servolo, Venice, Italy. POSTER PRESENTATION.
- **Torreggiani E**, Perut F, Roncuzzi L, Baldini N. "Isolation and characterization of exosome derived from human platelet lysate". 23<sup>rd</sup>-25<sup>th</sup> June 2013. "The 2013 eCM XIV: Stem and

Progenitor Cells for Musculoskeletal Regeneration”, Davos, Switzerland. POSTER PRESENTATION. Published in European Cells and Materials Vol. 26. Suppl. 3, 2013 (page 64). ISSN 1473-2262.

- **Torreggiani E**, Grcevic D, Matthews B, Kalajzic I. “Evaluation of  $\alpha$ SMA Expressing Cell Contribution To Muscle Heterotopic Ossification”. 14<sup>th</sup>-18<sup>th</sup> October 2012. “ASBMR Annual Meeting 2012”, Minneapolis, Minnesota, USA. POSTER PRESENTATION. Published in Journal of bone and mineral research / ASBMR (ed). ISSN 0159-8090.
- **Torreggiani E**, Pejda S, Matic I, Horowitz M, Kalajzic I. “Evaluation of osteocyte dedifferentiation in vitro and in vivo”. 14<sup>th</sup>-18<sup>th</sup> October 2012. “ASBMR Annual Meeting 2012”, Minneapolis, Minnesota, USA. POSTER PRESENTATION.
- **Torreggiani E**, Grcevic D, Matthews B, Kalajzic I. “Evaluation of  $\alpha$ SMA Expressing Cell Contribution To Muscle Heterotopic Ossification”. 17<sup>th</sup>-18<sup>th</sup> July 2012. “ASBMR Topical Meeting on Bone and Skeletal Muscle Interactions”, Kansas City, Missouri, USA. POSTER PRESENTATION.
- **Torreggiani E**, Pejda S, Matic I, Horowitz M.C, Kalajzic I. “Evaluation of osteocyte dedifferentiation in vitro and in vivo”. 20<sup>th</sup>-22<sup>th</sup> June 2012. “Stem Cell Research Italy”, Ferrara, Italy. ORAL PRESENTATION.
- **Torreggiani E**, Lambertini E, Penolazzi L, Vecchiatini R, Lisignoli G, Nastruzzi C, Piva R. “Osteogenic potential of human mesenchymal stem cells: role of specific transcription factors”. 16<sup>th</sup>-20<sup>th</sup> September 2011. “ASBMR 2011”, San Diego, California, USA. POSTER PRESENTATION.
- **Torreggiani E**. “The osteogenic potential of mesenchymal stem cells from Wharton’s Jelly: molecular and tissue engineering implications”. 18<sup>th</sup> May 2010. “I Meeting Stem Cell Research Italy”, Certosa di Pontignano (Siena), Italy. ORAL PRESENTATION.
- **Torreggiani E**. “New potential targets for therapeutical approach in bone tissue engineering”. 30<sup>th</sup> March 2010. Journal Club, Department of Reconstructive Sciences, School of Dental Medicine, University of Connecticut Health Center, Farmington, CT, USA. ORAL PRESENTATION.
- **Torreggiani E**. “Mesenchymal stem cells from Wharton’s jelly: encapsulation in alginate microbeads and osteogenic differentiation”. 7<sup>th</sup>-10<sup>th</sup> October 2009. “Bone Stem Cells”, Bertinoro (Forlì), Italy. ORAL PRESENTATION.
- **Torreggiani E**, Penolazzi L, Vecchiatini R, Bignardi S, Lambertini E, Franceschetti T, Vesce F, Piva R. Correlation between obstetric factors and potential of mesenchymal stem cells from umbilical cord: a preliminary study. 15<sup>th</sup>-17<sup>th</sup> June 2009: EMBO Conference: “Advances in stem cell research: stem cells, systems and synthetic biology”, Cambridge, UK. POSTER PRESENTATION.

## **Areas of research**

- Isolation and characterization of exosomes derived from human platelet lysate.
- Evaluation of dedifferentiation-redifferentiation of preosteocytes/osteocytes in vitro and in vivo.
- Characterization of  $\alpha$ -SMA (alpha smooth muscle actin) expressing cells in murine models of ectopic bone formation.
- Investigation of new cellular models for the analysis of the osteogenesis, step by step, from progenitor to mature osteocyte, with the employment of mesenchymal cells from different source, like Wharton's Jelly, bone marrow and dental tissues. Analysis of the molecular pathways involved in osteogenesis (Wnt signalling).
- Sex hormone receptors (estrogen, androgen, progesteron) involvement in laryngeal carcinoma.
- Characterization of Slug gene regulation and function in human osteoblasts and osteoprogenitors, with particular interest in studying Lef-1 transcription factor role in Slug gene expression regulation.
- Human estrogen receptor alpha gene expression regulation by Runx2, AP-1 and NFATc1 transcription factors in human osteoblasts.

## **Technical skills**

- *Cell cultures:*
  - Human primary osteoblasts from bone tissue (femur, hip, knee, jaw, nasal bone).
  - Human mesenchymal stem cells derived from: Wharton's Jelly, adipose tissue, bone marrow, tibial plateau.
  - osteoblast clones isolation from human mesenchymal stem cells harvested from umbilical cord blood and Wharton's Jelly.
  - osteoclasts isolation from human peripheral and cord blood.
  - osteocytes from bone chips (femur and tibia) outgrowth cultures derived from transgenic mice
  - murine bone marrow stromal cells
  - murine primary muscle stromal cells
- *Cellular techniques:* Cell transient transfection with different constructions, decoy molecules and small interfering RNA (siRNA), exosome isolation, cell differentiation (osteogenic, adipogenic and chondrogenic differentiation), Alizarin Red, Von Kossa and

Alkaline phosphatase staining, Oil Red O staining, Alcian blue, Alamar blue assay, Boyden chamber assay, Hematoxylin and eosin staining, immunocytochemistry, imaging.

- *Histotechniques*: bone (femur, tibia, calvaria) and soft tissue (muscle and skin) removal, decalcification, embedding, frozen sections preparation, sectioning with microtome, immunohistochemistry, imaging.
- *Molecular biology techniques*: DNA and RNA extraction, electrophoresis, PCR, RT-PCR, quantitative RT-PCR (Real-Time), luciferase assay, Western blotting, functional assays, nuclear extract, electrophoresis mobility shift (EMSA) and supershift assay, chromatin immunoprecipitation assay (ChIP), ELISA.
- *In vivo techniques*: mice subcutaneous, intraperitoneal and intramuscular injection (collagen, matrigel, rhBMP2), mice subcutaneous cell transplantation.