

PERSONAL INFORMATION

Marco Vincenzo Patruno

WORK EXPERIENCE

January 2001- Present

Associate Professor, Dept. Comparative Biomedicine & Food Science (BCA)

University of Padova (Italy)

Teaching: Professor of Veterinary Anatomy, Histology and Embryology for the Veterinary and Biotechnology course; Professor of Comparative Anatomy for the Animal Care course.- Responsible for the Internationalization of BCA Department. Research topics:- Characterization of adult stem cells in veterinary medicine- Study the effects of cryopreservation on mesenchymal stem cells isolated from adipose tissue of dog and peripheral blood of horse.- In vivo study on sheep/horse tendon/skin regeneration- Development of a human biocompatible tendon scaffold re-cellularized with adipose derived stem cells.- Results obtained during these years allowed to widen, also in the veterinary field, knowledge and potential application of stem cells obtained from peripheral blood or adipose tissue. In particular we have investigated the potential application of stem cells in tendon and skin regeneration both in sheep and horses and in human for full thickness tendon lesions.- Prof. Patruno has gained the national scientific habilitation (ASN) for the sector 07/H1 on the 3-12-2013 and 24-10-2018- h-index: 25 Author of more than 150 international publications of which 64 full papers, 9 chapters in books of international interest, 61 international congress (14 times speaker), 38 national congress (9 times speaker); in collaboration with other colleagues, a textbook of Embryology.- National winner as young researcher at the 4° National Congress of Veterinary Morphology (2004, University of Torino).- Supervisor of fellowship projects of many Italian postdocs in foreign institutions;- Reviewer of projects for national and international agencies (ISF, ALW, Italian MIUR, and The French National Research Agency);- Reviewer for ARTI, Agenzia Regionale per la Tecnologia e Innovazione, Regione Puglia (Future In Research).- Reviewer of scientific papers for a number of peer reviewed international journals (Animal Genomics; Cell and Tissue research; The Anatomical Record; Journal of Histochemistry and Cytochemistry; European Journal of Histochemistry; Comparative Biochemistry and Physiology; Genes development and evolution; Histochemistry and Cell Biology; Stem Cells; Tissue Engineering; Equine Veterinary Journal)- Member associate of the Society for Experimental Biology (UK), Italian Association Veterinary Morphology, Group ABCD-Regulation of Development and the International Veterinary Regenerative Medicine Society (IVRMS).- The research group led by Prof. Patruno has characterized adult stem cells from blood of the horse and adipose tissue of the dog and showed that cryopreservation does not modify their stemness features; recent studies focus on evaluating the regenerative potential of stem cells for the regular dense connective tissue (tendons) and skin, in vitro and in vivo. The same research group furnishes a service for Veterinarians named StemCell Services dedicated to the analysis and cryopreservation of stem cells of several animals.- Divulgative paper in the Vet. Journal. (2012): <http://www.vetjournal.it/approfondimento.php?codnotizia=5259>- Ecm journal, Divulgative paper about the research of Prof Patruno. Successful Recellularization of Human Tendon Scaffolds Using Adipose-Derived Mesenchymal Stem Cells and Collagen Gel, by Martinello et al. <http://connexoncreative.com/publications/archives/ECM324.aspx>- JEB journal; Divulgative paper about the research of Prof. Patruno. Out of place isoform: <http://jeb.biologists.org/content/207/11/ii>- Coordinator of iMOVES, International Mobility of Veterinary Students (2014-18): thanks to regular funding, each year, 10 Italian and 10 American students join the summer school program involving Food Safety & Veterinary Clinical Rotations.- Participating in the organization of the European Journal of Translational Myology: Functional Rejuvenation in Aging and Neuromuscular Disorders. Villa Emy B&B, Stra, Venice & Padova (Italy), September 29&30, 2015- Participating in the organization of the 2016 Spring Padua Muscle Days: Muscle Decline in Aging and Neuromuscular Disorders Mechanisms and Countermeasures. Terme Euganee, Padova (Italy), April 13 - 16, 2016

January 2000-December 2000

Post Doc

Neural Development Group, Kings College, University of London, UK. (United Kingdom)
One year of laboratory research aimed to clone genes important during regenerative processes.

- January 1997-December 1999 **PhD student (research on biology of regeneration/reparative processes)**
 School of Biological Sciences, Royal Holloway, University of London (United Kingdom)
 Molecular and cellular biology applied to the study of regeneration in different animal models. Ph.D. degree in Developmental Biology: Royal Holloway, University of London. During my PhD degree I worked in different Universities: September 1998, laboratory of Dr. G. Wray, Department of molecular evolution, Stony Brook University of New York NY; August 1999, host at the Kristineberg Marine research station, University of Goteborg, SW.
- January 1996-December 1996 **Post graduate researcher**
 University of Milan, Dept. of Biology. (Italy)
 Research topic: study the satellite stem cells during the muscle growth of *S. aurata*. In 1996 I won a grant (named perfezionamento allestero) used to work at the laboratory of Prof. M. Thorndyke, University of London. In the latter University I obtained, in 1997, another grant as an outstanding student, which allowed the payment of fees for the three year PhD course.
- January 1995-December 1995 **Student work placement in the laboratory of Prof. A. Rowlerson.**
 University of London, Division of Physiology, United Medical and Dental Schools (UMDS) of Guy's and St. Thomas's Hospital. (United Kingdom)
 Immunohistochemistry on myogenic factors during the development of different animal species.

EDUCATION AND TRAINING

- January 1990-March 1995 **Master degree in Animal Sciences (110/110 cum laude)**
 University of Veterinary Medicine, Milan (Italy)
- May 1997-December 1999 **PhD Developmental Biology**
 Royal Holloway, University of London (United Kingdom)

ADDITIONAL INFORMATION

Expertise Adult stem cells; tissue engineering; muscle development; regenerative medicine

Publications Recent Publications (from 2013)

-) IACOPETTI I, PATRUNO* M, MELOTTI L, MARTINELLO T, BEDIN S, BADON T, RIGHETTO E, PERAZZI A. Autologous platelet-rich plasma enhances the healing of large cutaneous wounds in dogs. *Frontiers in Veterinary Science*. 2020 doi: <https://doi.org/10.3389/fvets.2020.575449>
-) FERRARIO C, RUSCONI F, PULAJ A, MACCHI R, LANDINI P, PARONI M, COLOMBO G, MARTINELLO T, MELOTTI L, GOMIERO C, CANDIA CARNEVALI MD, BONASORO F, PATRUNO* M, SUGNI M. From Food Waste to Innovative Biomaterial: Sea Urchin-Derived Collagen for Applications in Skin Regenerative Medicine. *Mar Drugs*. 2020 Aug 6;18(8):E414. doi: 10.3390/md18080414.
-) ELSHAZLY N, KHALIL A, SAAD M, PATRUNO* M, CHAKRABORTY J, MAREI M. Efficacy of Bioactive Glass Nanofibers Tested for Oral Mucosal Regeneration in Rabbits with Induced Diabetes. *Materials (Basel)*. 2020 Jun 7;13(11):2603. doi: 10.3390/ma13112603.
-) SAMMARCO A, GOMIERO C, SACCHETTO R, BEFFAGNA G, MICHIELETTO S, ORVIETO E, CAVICCHIOLI L, GELAIN ME, FERRO S, PATRUNO M, ZAPPULLI V. Wnt/Catenin and Hippo Pathway Deregulation in Mammary Tumors of Humans, Dogs, and Cats. *Vet Pathol*. 2020 Aug 18:300985820948823. doi: 10.1177/0300985820948823. Online ahead of print.
-) PERAZZI A, GOMIERO C, CORAIN L, IACOPETTI I, GRISAN E, LOMBARDO M, LOMBARDO G, SALVALAIO G, CONTIN R, PATRUNO M, MARTINELLO T, PERUFFO A. An Assay System to Evaluate Riboflavin/UV-A Corneal Phototherapy Efficacy in a Porcine Corneal Organ Culture Model. *Animals (Basel)*. 2020 Apr 23;10(4):E730. doi: 10.3390/ani10040730.
-) IRIS RIBITSCH, PEDRO M. BAPTISTA, ANNA LANGE-CONSIGLIO, LUCA MELOTTI, MARCO PATRUNO, FLORIEN JENNER, EVA SCHNABL-FEICHTER, Luke C. Dutton, David J. Connolly, Frank G. van Steenbeek, Jayesh Dudhia and Louis C. Penning. Large Animal Models in Regenerative Medicine and Tissue Engineering: To Do or Not to Do. *Front. Bioeng. Biotechnol.*, 13 August 2020 | <https://doi.org/10.3389/fbioe.2020.00972>

-) IACOPETTI I, PERAZZI A, MARTINELLO T, GEMIGNANI F, PATRUNO* M. Hyaluronic acid, Manuka honey and Acemannan gel: Wound-specific applications for skin lesions. *Res Vet Sci.* 2020 Jan 11;129:82-89. doi: 10.1016/j.rvsc.2020.01.009. [Epub ahead of print]
-) CANCELLARA L, QUARTESAN S, TONIOLO L, REGGIANI C, MELOTTI L, FRANCOLINI M, MASCARELLO F, MACCATROZZO L, PATRUNO* M. Age-dependent variations in the expression of myosin isoforms and myogenic factors during the involution of the proximal sesamoidean ligament of sheep. *Res Vet Sci.* 2019, 124:270-279.
-) MELOTTI L, VEZZOLI E, MASCARELLO F, MACCATROZZO L, PATRUNO* M. The natural involution of the sheep proximal sesamoidean ligament is due to depletion of satellite cells and simultaneous proliferation of fibroblasts: Ultrastructural evidence. *Res Vet Sci.* 2019, 8;124:106-111. doi: 10.1016/j.rvsc.2019.03.005
-) MARTINELLO T, GOMIERO C, PERAZZI A, IACOPETTI I, GEMIGNANI F, DEBENEDICTIS GM, FERRO S, ZUIN M, MARTINES E, BRUN P, MACCATROZZO L, CHIERS K, SPAAS JH, PATRUNO* M. Allogeneic mesenchymal stem cells improve the wound healing process of sheep skin. *BMC Vet Res.* 2018;14:202. doi: 10.1186/s12917-018-1527-8.
-) PATRUNO* M, PERAZZI A, MARTINELLO T, GOMIERO C, MACCATROZZO L, IACOPETTI I. Investigations of the corneal epithelium in Veterinary Medicine: State of the art on corneal stem cells found in different mammalian species and their putative application. *Res Vet Sci.* 2018;118:502-507. doi: 10.1016/j.rvsc.2018.05.006.
-) RAVARA B, GOBBO V, INCENDI D, PORZIONATO A, MACCHI V, CARO R, COLETTI D, MARTINELLO T, PATRUNO* M. Revisiting the peculiar regional distribution of muscle fiber types in rat Sternomastoid Muscle. *Eur J Transl Myol.* 2018 Mar 1;28(1):7302. doi: 10.4081/ejtm.2018.7302. PMID: 29686819
-) GIURIATI W, RAVARA B, PORZIONATO A, ALBERTIN G, STECCO C, MACCHI V, CARO R, MARTINELLO T, GOMIERO C, PATRUNO M, COLETTI D, ZAMPIERI S, NORI A. Muscle spindles of the rat sternomastoid muscle. *Eur J Transl Myol.* 2018, 13;28(4):7904.
-) PATRUNO* M, MELOTTI L, GOMIERO C, SACCHETTO R, TOPEL O, MARTINELLO T. A mini-review of TAT-MyoD fused proteins: state of the art and problems to solve (2017) *Eur J Transl Myol* 27: 234-238. doi: 10.4081/ejtm.2017.6039
-) PATRUNO* M, GOMIERO C, SACCHETTO R, TOPEL O, NEGRO A, MARTINELLO T. Tat-MyoD fused proteins, together with C2c12 conditioned medium, are able to induce equine adult mesenchymal stem cells towards the myogenic fate. *Vet Res Commun.* 2017. Vol 41:211-217. doi: 10.1007/s11259-017-9692-y.
-) MAGRO M, MARTINELLO T, BONAIUTO E, GOMIERO C, BARATELLA D, ZOPPELLARO G, COZZA G, PATRUNO M, ZBORIL R, VIANELLO F. Covalently bound DNA on naked iron oxide nanoparticles: Intelligent colloidal nano-vector for cell transfection. 2017. 1861(11PtA):2802-2810.
-) PERAZZI ANNA, BONSEMBIANTE FEDERICO, GELAIN MARIA ELENA, PATRUNO MARCO, ENZO DI IORIO, MIGLIORATI ANGELO, IACOPETTI ILARIA (2017). Cytology of the healthy canine and feline ocular surface: comparison between cytobrush and impression technique. *VETERINARY CLINICAL PATHOLOGY*, Vol. 46:164-171. ISSN: 0275-6382, doi: 10.1111/vcp.12450
-) PATRUNO* M, PERAZZI A., MARTINELLO T., BLASEOTTO A., DI IORIO E., IACOPETTI I. (2017). Morphological description of limbal epithelium: searching for stem cells crypts in the dog, cat, pig, cow, sheep and horse. *VETERINARY RESEARCH COMMUNICATIONS*, Vol. 41: 1694-173, ISSN: 0165-7380, doi: 10.1007/s11259-017-9676-y
-) SPAAS JAN H., GOMIERO CHIARA, BROECKX SARAH Y., VAN HECKE LORE, MACCATROZZO LISA, MARTENS ANN, MARTINELLO TIZIANA, PATRUNO* MARCO (2016). Wound-healing markers after autologous and allogeneic epithelial-like stem cell treatment. *CYTOTHERAPY*, vol. 18, ISSN: 1465-3249, doi: 10.1016/j.jcyt.2016.01.008
-) GOMIERO CHIARA, BERTOLUTTI GIULIA, MARTINELLO TIZIANA, VAN BRUAENE NATHALIE, BROECKX SARAH Y., PATRUNO* MARCO, SPAAS JAN H. (2016). Tenogenic induction of equine mesenchymal stem cells by means of growth factors and low-level laser technology. *VETERINARY RESEARCH COMMUNICATIONS*, vol. 40, ISSN: 0165-7380, doi: 10.1007/s11259-016-9652-y

-) ILARIA IACOPETTI, ANNA PERAZZI, VALENTINA MANIERO, TIZIANA MARTINELLO, MARCO PATRUNO, MILJANA GLAZAR, ROBERTO BUSETTO (2015). Effect of MLS(R)Laser Therapy with Different Dose Regimes for the Treatment of Experimentally Induced Tendinopathy in Sheep: Pilot Study. *PHOTOMEDICINE AND LASER SURGERY*, vol. 33, p. 154-163, ISSN: 1549-5418, doi: 10.1089/pho.2014.3775
-) PERAZZI A., PATRUNO M., MARTINELLO T., GLAZAR M., IACOPETTI I (2015). Effect of MLS(R) laser therapy for the treatment of experimentally induced acute tendinopathy in sheep - a preliminary study. *ENERGY FOR HEALTH*, vol. 14, p. 4-7, ISSN: 2281-3268
-) MARTINELLO T, PASCOLI F, CAPORALE G, PERAZZI A, IACOPETTI I, PATRUNO* M (2015). Might the masson trichrome stain considered a useful method for categorizing experimental tendon lesions? *HISTOLOGY AND HISTOPATHOLOGY*, ISSN: 0213-3911, doi:10.16470/HH-11-601
-) PATRUNO* M, MARTINELLO T (2014). Treatments of the injured tendon in Veterinary Medicine: from scaffolds to adult stem cells. *HISTOLOGY AND HISTOPATHOLOGY*, vol. 29, p. 417-422, ISSN: 0213-3911
-) BENEDETTO CD, BARBAGLIO A, MARTINELLO T, ALONGI V, FASSINI D, CULLORA E, PATRUNO M, BONASORO F, BARBOSA MA, CARNEVALI MD, SUGNI M (2014). Production, characterization and biocompatibility of marine collagen matrices from an alternative and sustainable source: the sea urchin *Paracentrotus lividus*. *MARINE DRUGS*, vol. 12, p. 4912- 4933, ISSN: 1660-3397, doi: 10.3390/md12094912 -Impact Factor 2.853
-) GALGANO M, SPALLA I, CALLEGARI C, PATRUNO M, AURIEMMA E, ZANNA G, FERRO S, ZINI E. (2014). Primary Hypothyroidism and Thyroid Goiter in an Adult Cat. *JOURNAL OF VETERINARY INTERNAL MEDICINE*, vol. 28, p. 682-686, ISSN: 0891-6640, doi:10.1111/jvim.12283. -Impact Factor 1.879
-) BROECKX SY, MAES S, MARTINELLO T, AERTS D, CHIERS K, MARIEN T, PATRUNO M, FRANCO-OBREGON A, SPAAS JH. (2014). Equine epidermis: a source of epithelial-like stem/progenitor cells with in vitro and in vivo regenerative capacities. *STEM CELLS AND DEVELOPMENT*, vol. 23, p. 1134-1148, ISSN: 1547-3287, doi: 10.1089/scd.2013.0203.
- 15) MARTINELLO T, BRONZINI I, VOLPIN A, VINDIGNI V, MACCATROZZO L, CAPORALE G, BASSETTO F, PATRUNO M. (2014). Successful recellularization of human tendon scaffolds using adipose-derived mesenchymal stem cells and collagen gel. *JOURNAL OF TISSUE ENGINEERING AND REGENERATIVE MEDICINE*, vol. 8, p. 612-619, ISSN: 1932-6254, doi:10.1002/term.1557 -Impact Factor 5.199
-) PERAZZI A., BUSETTO R., MARTINELLO T., DRIGO M., PASOTTO D., CIAN F., PATRUNO M., IACOPETTI I. (2013). Description of a double centrifugation tube method for concentrating canine platelets *BMC VETERINARY RESEARCH*, 146, ISSN: 1746-6148, doi: 10.1186/1746-6148-9-146
-) RENZI S, RICCO S, DOTTI S, SESSO L, GROLLI S, CORNALI M, CARLIN S, PATRUNO M, CINOTTI S, FERRARI M. (2013). Autologous bone marrow mesenchymal stromal cells for regeneration of injured equine ligaments and tendons: A clinical report. *RESEARCH IN VETERINARY SCIENCE*. 95:272-7. (ISSN:0034-5288) doi: 10.1016/j.rvsc.2013.01.017
-) MARTINELLO T., BRONZINI I., PERAZZI A., TESTONI S., DE BENEDETTIS G.M, NEGRO A., CAPORALE G., MASCARELLO F., IACOPETTI I., PATRUNO* M. (2013). Effects of in vivo applications of peripheral blood-derived mesenchymal stromal cells (PB-MSCs) and platelet-rich plasma (PRP) on experimentally injured deep digital flexor tendons of sheep. *JOURNAL OF ORTHOPAEDIC RESEARCH* (ISSN:0736-0266), 306- 314, 31;

Projects RECENT RESEARCH GRANTS

- PI / Coordinator of the National PRIN-MIUR 2017. BRITEs project.

BRITEs: Byproduct Recycling: Innovative TEchnology from the Sea

- H2020: Participation as Coordinator of the European Project EMOTION: nEW Marine biOmaTerlals fOr skiN restoration: optimal yield solutions (submission 12-12-19) Score:8/10

- Local PI of the project "Circular" Chain for Innovative ReCycling: sea Urchin food by-products for zero waste-based muLtipLe Applications. Score: Outstanding Bando: "Economia Circolare: a Fondazione Cariplo , 2019.

TEACHING GRANTS

- iMOVES (International Mobility of Veterinary Students) project: 2008, 2012, 2014 and 2016 (50.000 in 2008, 15.000 in 2012, 18.000 in 2014, 16.000 in 2016, 8.500 in 2018).

- 2013, grant from the Ateneo of Padova for the mobility of researchers, named

Cooperazione Universitaria

- 2019 and 2020 Erasmus KA107 with South Africa (University of Kwazulu Natal, Durban, ZA)

Memberships

- Review Editor, Frontiers in Veterinary Science journal, Veterinary Regenerative Medicine

- Part of the Editorial Board for BMC Veterinary Research

Other Relevant Information

- Agosto 2002, Royal Swedish Academy of Sciences, Kristineberg Marine Research Station

- Marzo 2003, invited speaker at SEB, Southampton (UK).

- - Invited Visiting researcher at Botucatu university in 2013. UNESP - School of Veterinary Medicine and Animal Science.

- October 2013, Invited speaker at Sau Paolo Hospital, Brasil: public lecture by Prof. Patrino at the Department of Orthopedics and Traumatology, UNESP, School of Medicine, Sau Paolo, Brasil to discuss the use of PRP and MSC in Human and Veterinary Medicine.

- Invited speaker at TERMIS international conference in 2015, Genova (Italy) and 2016, Uppsala (Sweden)

- July 2015, 2017 Invited speaker at Texas A&M, USA. Scientific seminars for Vet students

- May 2017, Invited speaker at Sydney University, AU. Scientific seminars for Vet students

- July 2016, 2017, Invited speaker at Colorado State University, USA. Scientific seminars for Vet students

- July 2017, Invited speaker at Kansas State University, USA. Scientific seminars for Vet students

- National winner as "young researcher" at the 4^o National Congress of Veterinary Morphology (2004, University of Torino).

- Supervisor of fellowship projects of many Italian postdocs in foreign institutions;

- Reviewer of projects for national and international agencies (ISF, ALW, Italian MIUR, and The French National Research Agency);

- Reviewer for ARTI, Agenzia Regionale per la Tecnologia e l'Innovazione, Regione Puglia ("FutureInResearch").

- Reviewer of scientific papers for a number of peer reviewed international journals (Animal Genomics; Cell and Tissue research; The Anatomical Record; Journal of Histochemistry and Cytochemistry; European Journal of Histochemistry; Comparative Biochemistry and Physiology; Genes development and evolution; Histochemistry and Cell Biology; Stem Cells; Tissue Engineering; Equine Veterinary Journal)

- Prof. Patruno has gained the national scientific "abilitazione" (ASN) for the Veterinary sector 07/H1 on the 3-12-2013 and 24-10-2018
- Responsible/Coordinator of the Internationalization Committee of BCA Department.
- Teaching commission of BCA
- EAEVE commission of BCA
- International commission of Padua University (delegate of the BCA Director)
- Responsible for the Microscopic facilities for BCA/MAPS Dept.
- iMOVES coordinator for BCA/MAPS Dept. (international mobility of veterinary students, Summer School)