

CURRICULUM VITAE

ALESSANDRO F. PELLEGGATA, PhD

Dr Pellegata had his training in bioengineering at Politecnico di Milano (Italy) in the group of Professor Mantero. During his PhD, Dr Pellegata demonstrated that decellularised blood vessels can be used as functional arterial grafts in a large animal model (Pellegata et al, Biomed Res Int 2013, Pellegata et al, Cells Tissues Organs 2015). After completion of the PhD, he worked as postdoctoral scientist at Politecnico di Milano on a project aimed at tendon tissue engineering for which he secured funding (Bottagisio et al, Eur Cell Mater 2016, Pellegata et al, Mater Sci Eng C Mater Biol Appl 2017).

He was then appointed to a postdoctoral research associate position at the UCL GOS Institute of Child Health (London, UK) in Professor De Coppi's group. During this postdoctoral position, he supervised a project which elucidated the crosstalk mechanisms occurring between endothelial cells and pericytes, in a whole-organ in vitro and in vivo model. Concurrently, he supervised a project which demonstrated the regenerative potential of decellularised gastric tissue (Zambaiti et al, Ped Surg Int 2018). Moreover, he worked on an important project which established the crucial role of the ETV2 transcription factor in endothelial cells (Palikuqi et al, Nature 2020). In 2018, Dr Pellegata was appointed as career development research associate by the NHIR Great Ormond Street Biomedical Research Centre (London, UK) to work on in-vitro organ models for vascularisation and organoids models (Meraan et al, Nat Med 2020; Giobbe et al, Nat Comm 2021).

From mid-2019 till the end of 2020 he worked as Senior Postdoc at the Centre for Nanoscience and Technology at the Italian Institute of Technology. His research was focused on the use of innovative techniques in regenerative medicine, in particular for the regeneration and engineering of the heart and the vasculature.

In February 2021 he was appointed as assistant professor at Politecnico di Milano (Italy). His research interests are organ regenerative medicine and the development of organoids-based models for personalised medicine.

RESEARCH POSITIONS

01/02/2021 Current	<u>Assistant Professor</u> , Department of Chemistry Materials and Chemical Engineering, Politecnico di Milano, Milan, Italy
11/07/2022 Current	<u>Associate Staff</u> , GOS Institute of Child Health, UCL, London, UK
16/07/2019 11/07/2022	<u>Honorary Senior Research Associate</u> , GOS Institute of Child Health, UCL, London, UK
16/07/2019 31/01/2021	<u>Senior Postdoc</u> , Italian Institute of Technology, Centre for Nanoscience and Technology, Milan, Italy
01/07/2018 07/07/2019	<u>Career development research associate</u> , NHIR Great Ormond Street Biomedical Research Centre at UCL GOS Institute of Child Health, UCL, London, UK
01/10/2015 30/06/2018	<u>Postdoctoral research associate</u> , Paolo de Coppi's lab. GOS Institute of Child Health, UCL, London, UK
18/12/2014 30/09/2015	<u>Postdoctoral research associate</u> , Department of chemistry, materials and chemical engineering, Politecnico di Milano, Milan, Italy
01/11/2010 30/09/2011	<u>Research assistant</u> , Department of Bioengineering, Politecnico di Milano, Milan, Italy

EDUCATION AND TRAINING

07/03/2017	Human Tissue Act training, UCL Institute of Child Health, London, UK
01/10/2011 17/12/2014	PhD in <u>Bioengineering</u> , awarded <i>cum laude</i> . Politecnico di Milano, Milan, Italy. Supervisor Prof Sara Mantero.
20/11/2012	Engineering professional practice exam, Politecnico di Milano, Milan, Italy
21/07/2010 26/10/2007	MSc in Bioengineering, Politecnico di Milano, Milan, Italy
25/9/2007 20/09/2003	BSc in Bioengineering, Politecnico di Milano, Milan, Italy

PUBLICATIONS (H-index 11)

1. Negri S, Faris P, Tullii G, Vismara M, **Pellegata AF**, Lodola F, Guidetti G, Rosti V, Antognazza MR, Moccia F. *Conjugated polymers mediate intracellular Ca²⁺ signals in circulating endothelial colony forming cells through the reactive oxygen species-dependent activation of Transient Receptor Potential Vanilloid 1 (TRPV1)*. **Cell Calcium**. 2022 Jan;101:102502.

2. Giobbe GG, Bonfante F, Jones BC, Gagliano O, Luni C, Zambaiti E, Perin S, Laterza C, Busslinger G, Stuart H, Pagliari M, Bortolami A, Mazzetto E, Manfredi A, Colantuono C, Di Filippo L, **Pellegata AF**, Panzarin V, Thapar N, Li VSW, Eaton S, Cacchiarelli D, Clevers H, Elvassore N, De Coppi P. *SARS-CoV-2 infection and replication in human gastric organoids*. **Nature Communications**. Nat Commun. 2021 Nov 16;12(1):6610
3. De Stefano P, Briatico-Vangosa F, Bianchi E, **Pellegata AF**, Hartung de Hartungen A, Corti P, Dubini G. *Bioprinting of Matrigel Scaffolds for Cancer Research*. **Polymers** (Basel). 2021 Jun 21;13(12):2026
4. Sassi L, Ajayi O, Campinoti S, Natarajan D, McQuitty C, Siena RR, Mantero S, De Coppi P, **Pellegata AF**, Chokshi S, Urbani L. *A Perfusion Bioreactor for Longitudinal Monitoring of Bioengineered Liver Constructs*. **Nanomaterials** (Basel). 2021 Jan 21;11(2):275. doi: 10.3390/nano11020275
5. Lorvellec M, **Pellegata AF**, Maestri A, Turchetta C, Alvarez Mediavilla E, Shibuya S, Jones B, Scottoni F, Perocheau DP, Cozmescu AC, Delhove JM, Kysh D, Gjinovci A, Counsell JR, Heywood WE, Mills K, McKay TR, De Coppi P, Gissen P. *An In Vitro Whole-Organ Liver Engineering for Testing of Genetic Therapies*. **iScience**. 2020 Nov 13;23(12):101808. doi: 10.1016/j.isci.2020.101808. eCollection 2020 Dec 18.
6. Palikuqi B, Nguyen DT, Li G, Schreiner R, **Pellegata AF**, Liu Y, Redmond D, Geng F, Lin Y, Gómez-Saliner JM, Yokoyama M, Zumbo P, Zhang T, Kunar B, Witherspoon M, Han T, Tedeschi AM, Scottoni F, Lipkin S, Dow L, Elemento O, Schwartz RE, Xiang J, Shido K, Spence J, Zhou JQ, De Coppi P, Rabbany SY, Rafii S. *Adaptable haemodynamic endothelial cells for organogenesis and tumorigenesis*. **Nature**. <https://doi.org/10.1038/s41586-020-2712-z>. Online ahead of print
7. Meran L, Massie I, Weston A, Gaifulina R, Fauli P, Orford M, Kucharska A, Baulies AHirst E, König J, **Pellegata AF**, Snijders B, Collinson L, Thapar N, Thomas G, Eaton S, Bonfanti P, De Coppi P, Li VSW. *Engineering transplantable jejunal mucosal grafts using patient-derived organoids from children with intestinal failure*. **Nature Medicine** doi: 10.1038/s41591-020-1024-z. Online ahead of print
8. Tresoldi C, Pacheco DP, Formenti E, **Pellegata AF**, Mantero S, Petrini P. *Shear-resistant hydrogels to control permeability of porous tubular scaffolds in vascular tissue engineering*. **Materials Science & Engineering C** doi:10.1016/j.msec.2019.110035.
9. Zambaiti E, Scottoni F, Rizzi E, Russo S, Deguchi K, Eaton S, **Pellegata AF***, De Coppi P*. *Whole rat stomach decellularisation using a detergent enzymatic protocol*. **Pediatric Surgery International** 2018 doi:10.1007/s00383-018-4372-8 (* contributed equally).
10. Urbani L, Camilli C, Phylactopoulos D, Crowley C, Natarajan D, Scottoni F, Maghsoudlou P, McCann CJ, **Pellegata AF**, Urciuolo A, Aruta S, Signorelli MC, Kiely D, Hannon E, Deguchi K, Trevisan M, Wong RR, Baradez MO, Moulding D, Khalaf S, Virasami A, Gjinovci A, Loukogeorgakis S, Mantero S, Thapar N, Sebire N, Eaton S, Lowdell M, Cossu G, Bonfanti P, De Coppi P. *Multi-stage bioengineering of a layered oesophagus with in vitro expanded muscle and epithelial adult progenitors*. **Nature Communications**. 2018 Oct 16;9(1):4286. doi: 10.1038/s41467-018-06385-w
11. **Pellegata AF**, Tedeschi AM and De Coppi P. *Whole Organ Tissue Vascularization: Engineering the Tree to Develop the Fruits*. **Front. Bioeng. Biotechnol.** 2018 May 14; 6:56. doi: 10.3389/fbioe.2018.00056.
12. Lorvellec M, Scottoni F, Crowley C, Fiadeiro R, Maghsoudlou P, **Pellegata AF**, Mazzacuva F, Gjinovci A, Lyne AM, Zulini J, Little D, Mosaku O, Kelly D, De Coppi P, Gissen P. *Mouse decellularised liver scaffold improves human embryonic and induced pluripotent stem cells differentiation into hepatocyte-like cells*. **PLoS One**. 2017 Dec 20;12(12):e0189586. doi: 10.1371/journal.pone.0189586.
13. Tresoldi C, Bianchi E, **Pellegata AF**, Dubini G, Mantero S. *Estimation of the physiological mechanical conditioning in vascular tissue engineering by a predictive fluid-structure interaction approach*. **Comput Methods Biomech Biomed Engin.** 2017 Aug;20(10):1077-1088. doi: 10.1080/10255842.2017.1332192.
14. **Pellegata AF**, Bottagisio M, Boschetti F, Ferroni M, Bortolin M, Drago L, Lovati AB. *Terminal sterilization of equine-derived decellularized tendons for clinical use*. **Mater Sci Eng C Mater Biol Appl.** 2017 Jun 1;75:43-49. doi: 10.1016/j.msec.2017.02.009.
15. Tresoldi C, Stefani I, Ferracci G, Bertoldi S, **Pellegata AF**, Farè S, Mantero S. *Alternating air-medium exposure in rotating bioreactors optimizes cell metabolism in 3D novel tubular scaffold polyurethane foams*. **J Appl Biomater Funct Mater.** 2017 Apr 26;15(2):e122-e132. doi: 10.5301/jabfm.5000334.
16. Bottagisio M, **Pellegata AF**, Boschetti F, Ferroni M, Moretti M, Lovati AB. *A new strategy for the decellularization of large equine tendons as biocompatible tendon substitutes*. **Eur Cell Mater.** 2016; Jul 8;32:58-73. PMID: 27386840.
17. **Pellegata AF**, Dominioni T, Ballo F, Maestroni S, Asnaghi MA, Zerbini G, Zonta S, Mantero S. *Arterial decellularized scaffolds produced using an innovative automatic system*. **Cells Tissues Organs.** 2015; 2015 Dec;2006:363-73. doi: 10.1159/000439082. Jul 8;32:58-73. PMID: 27386840.

18. Tresoldi C, **Pellegata AF**, Mantero S. *Cells and stimuli in small-caliber blood vessel tissue engineering*. **Regen Med**. 2015 May;10(4):505-27. doi: 10.2217/rme.15.19. PMID: 26022767.
19. **Pellegata AF**, Asnaghi MA, Stefani I, Maestroni A, Maestroni S, Dominioni T, Zonta S, Zerbini G, Mantero S. *Detergent-enzymatic decellularization of Swine blood vessels: insight on mechanical properties for vascular tissue engineering*. **Biomed Res Int**. 2013;2013:918753. doi: 10.1155/2013/918753. PMID: 23865072.
20. **Pellegata AF**, Asnaghi MA, Zonta S, Zerbini G, Mantero S. *A novel device for the automatic decellularization of biological tissues*. **Int J Artif Organs**. 2012 Mar;35(3):191-8. doi: 10.5301/ijao.5000079. PMID: 22461114.

INVITED TALKS

Mar 2019 - Invited talk at Italian Institute of Technology, Milan, Italy

Mar 2018 - Invited talk at Wellcome/EPSRC Centre for Interventional & Surgical Sciences, London, UK

Jan 2018 - Invited talk at the Foundation for Liver Research, King's College, London, UK

Dec 2017 - Invited talk at Weill Cornell Medical School, New York, USA

Mar 2015 - Invited talk at UCL Institute of Child Health, London, UK

CONFERENCE TALKS

Feb 2018 - Vascularisation for whole organ tissue engineering, Oral presentation at London Stem Cell Network Symposium, London, UK

Dec 2017 - Intestine Re-endothelialization For Whole Organ Bioengineering. Oral presentation at Termis American Conference, Charlotte, United States.

Jun 2017 - Liver tissue engineering: differentiation of iPSCs on acellular scaffolds under dynamic culture. Oral presentation at Termis European Conference, Davos, Switzerland.

Jun 2013 - In-vivo chimeric human-swine arterial implantation to investigate the fate of seeded cells on decellularized scaffolds. Oral presentation at Termis EU Conference, Istanbul, Turkey.

Jun 2011 - Porcine Arteries Decellularization. Oral presentation at Termis European Conference, Granada, Spain.

TEACHING

2022-current – Lecturer for the master degree course “Bioreactors” at Politecnico di Milano

2021-2022 – Lecturer for the master degree course “Capstone Projects” at Politecnico di Milano

May 2018 – Invited lecture for the MRC PhD programme at LMCB, UCL, London, UK

Jan 2018 – Invited lecture for the MSc in Cell and Gene Therapy, UCL, London, UK

Oct 2017 – Invited lecture for the MSc in Molecular Medicine, Imperial College, London, UK

Oct 2011 – Jan 2016 Teaching fellow (esercitatore). Politecnico di Milano, Milan, Italy (Classes: Bioingegneria Chimica and Applicazioni biotecnologiche e bioreattori)

Jul 2017 – Oct 2018 External examiner for PhD student at Instituto Superior Técnico, Universidade de Lisboa, Portugal (PhD student: Miriam de Sousa)

Apr 2018 – 2021 External advisor for PhD student at Institute of Hepatology, Foundation for Liver Research, London, UK (PhD student: Ewald Doornebal)

STUDENT SUPERVISION

I had successfully supervised 1 PhD student and 26 master students to completion; many of which are now enrolled in prestigious PhD programs internationally.

FUNDING

- Jan 2014 – Sept 2015** Co-investigator in the project "Innovative development of a decellularized equine-derived tendon matrix as implantable biomimetic support for tendon and ligament repair", call GR-2011-02348899 funded by the Italian Ministry of Health € 330,000. This project resulted in two publications without my PhD supervisor.
- Oct 2011 - Sept 2014** PhD scholarship from Italian Ministry of Education, University and Research

AWARDS

- Mar 2019** – Marie Skłodowska-Curie Actions Seal of Excellence (score 90.00%)
- Dec 2014** – PhD awarded cum laude by the examining commission.

PATENTS

- UK Patent 84-246 for Remote bioreactor submitted
- UK Patent 89-235 for De-cell & re-cell set up submitted

ACTIVE COLLABORATIONS

- Shahin Rafii, Weill Cornell Medical School, US – Vascular biology and endothelial cells
- Vivian Li, Francis Crick Institute, UK – Intestinal organoids and WNT pathway
- Sara Mantero, Politecnico di Milano, Italy – Bioreactor development
- Nicola Elvassore, Università di Padova, Italy – Microfluidic systems
- Paul Gissen, UCL, UK – Liver tissue engineering from iPSC
- Sue Kimber, Manchester University, UK – Renal tissue engineering from iPSC
- Paola Bonfanti, Francis Crick Institute, UK – Thymus tissue engineering
- Nicos Kessaris, King's College, UK – Human kidney engineering
- Giulio Cossu, Manchester University, UK – Mesoangioblasts for whole organ tissue engineering

REVIEWER ACTIVITY

- Acta Biomaterialia
- Plos One
- International Journal of Artificial Organs
- European Polymer Journal
- Scientific Reports

PUBLIC ENGAGEMENT

- Public dissemination of research for Great Ormond Street Hospital Children Charity