

Queralt Vallmajó – Martín

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EDUCATION

- 10.2014 – 07.2019 **PhD in Biotechnology and Bioengineering**
Laboratory for Cell and Tissue Engineering
EPF Lausanne – UniversitätsSpital Zürich, Switzerland
- 09.2011 – 07.2014 **Master Degree in Biomedical Engineering, Molecular Bioengineering**
ETH Zürich, Switzerland; GPA: 5.34/6.00
- 09.2013 – 06.2014 **Master Thesis**
Harvard – MIT, USA
- 09.2007 – 06.2011 **Bachelor Degree in Biotechnology**
UA Barcelona, Spain; *Valedictorian*
- 09.2009 – 09.2010 **Exchange Program in Biomedical Engineering**
UC Santa Cruz, CA, USA; GPA: 3.92/4.00

RESEARCH EXPERIENCE

- 08.2019 – current **Postdoctoral Fellow**
Laboratory for Cell and Tissue Engineering
UniversitätsSpital Zürich, Switzerland
- 10.2014 – 07.2019 PhD project, **EPF Lausanne – UniversitätsSpital Zürich**
Co-Directors: Prof. Matthias Lütolf; PD Dr. Martin Ehrbar
Bioengineering human bone marrow models to elucidate the triggers of the stem cell niche
 - Studying the formation of ectopic humanized HSC niches *in vivo*
 - Studying human and murine skeletal stem cell populations *in vivo*
 - Designing an optimized device for high throughput screening *in vivo*
 - Translating HSC niche to an *in vitro* model via novel biomaterials
 - Optimizing 3D well-defined matrices
- 09.2013 – 06.2014 Master Thesis, **Harvard – MIT**
Advisor: Prof. Ali Khademhosseini | External ETHZ Advisor: Prof. Viola Vogel
Engineering elastin-like polypeptide (ELP) gels with highly elastic and tunable properties for soft tissue engineering applications
 - Developed novel biologically inspired materials for tissue sealing
 - Characterized material's physical, chemical and mechanical properties
 - Defined cytocompatibility of the materials in 2D and 3D studies
 - Planned and performed *in vivo* studies in rat models
- 04.2012 – 05.2013 Semester Project and Research Assistant, **ETH Zürich**
Advisor: Prof. Marcy Zenobi-Wong | *Engineering chondrogenic microenvironments: modified PEG hydrogels and sulfated alginate hydrogels*

- 09.2010 – 05.2011 Senior Thesis Research, **Universitat Autònoma Barcelona**
 Advisor: Prof. Francesc Gòdia | *Design of second-generation porcine vaccine against porcine circovirus type 2 for mass production in bioreactors*
- 01.2010 – 09.2010 Associated student researcher, **UC Santa Cruz**
 Advisor: Prof. Nader Pourmand | *Calmodulin- modified nanopipette: a selective and reversible calcium biosensor*

RESEARCH AND TECHNICAL SKILLS

- Laboratory experience* Wide-range of experience in biomaterial engineering, molecular biology, cellular biology and mouse experimental research
- Biomaterial techniques* Material design, fabrication and engineering, rheology test, swelling tests
- Molecular techniques* Quantitative RT-PCR, Western Blot, ELISA, ALP quantification, DNA quantification, NGS, LC-MS/MS, immunohistochemistry
Courses: “Genome Engineering: CRISPR/Cas” (2018, EMBL Heidelberg)
- Cellular techniques* Isolation and culture of primary cell lines (mouse & human), culture in 3D with different biomaterials, transient transfections (siRNA), generation of stable cell lines by lentivirus transduction, flow cytometry analysis and sorting, CFSE cell proliferation, colony formation, multilineage differentiation (osteo, adipo, chondrogenic)
Courses: “Advanced Flow Cytometry” (2018, University of Zürich)
Summer school: “Stem Cells & Regenerative Medicine” (2015, Hydra)
- Animal experimentation* Mouse managing and maintenance (breeding), subcutaneous surgery, tail vein injection, necropsy, organ collection, processing for flow cytometry, fixation for microCT and histology
 Certificate and Training for Conducting Animal Experiments in Switzerland (2015, EPFL Lausanne)
- Microscopy techniques* Confocal Microscopy and Scanning Electron Microscopy, X-ray microtomography
Courses: “Practical Course in Advanced Microscopy” (2017, ETHZ Zürich)
- Computing* ImageJ – Fiji, Imaris, FlowJo, DIVA, Adobe Photoshop, Illustrator/InDesign, Matlab, GraphPad-Prism, IBM SPSS Statistics, EndNote
- Teaching/Supervision* Consultant for the Swiss startup CellSpring (2019-current)
 Supervision of 3 Master Thesis students (6 month project, 2016-2018)
 Teaching assistant of the courses: “Biological Methods for Engineers” (2013 and 2014, ETHZ Zürich), “Cell Biology for Engineers” (2012 and 2013, ETHZ Zürich)
 Mentor of undergraduate students (2008-2009, UAB Barcelona)
 Volunteer in teaching Science in women’s prison (2008- 2011, Barcelona)
- Comm./Executive* Executive Member of the Swiss Society for Biomaterials & Regenerative Medicine
 Organizing committee of the Young Scientists of the Swiss Society for Biomaterials (Young Scientists Symposiums + Lab & Networking events)
- Languages* Catalan (native), Spanish (native), English (full professional proficiency), German (conversational), French (basic)

REFERENCES

- PD Dr. Martin Ehrbar, University Hospital Zürich (martin.ehrbar@usz.ch, +41 44 255 8513)
 Prof. Matthias Lütolf, EPFL Lausanne (matthias.lutolf@epfl.ch, +41 21 693 7213)
 Prof. Marcy Zenobi–Wong, ETHZ Zürich (marcy.zenobi@hest.ethz.ch, +41 44 632 5089)
 Prof. Ali Khademhosseini, UCLA (khademh@ucla.edu, +1 310 794 7179)

APPENDIX

Publications

Q Vallmajo-Martin, N Broguiere, C Millan, M Zenobi-Wong, M Ehrbar. PEG/HA hybrid hydrogels for biologically and mechanically tailorable bone marrow organoids. **Advanced Functional Materials**, 2020.

ER Horton, Q Vallmajo-Martin, I Martin, JG Snedeker, M Ehrbar, U Blache. Extracellular matrix production by mesenchymal stromal cells in hydrogels facilitates cell spreading and is inhibited by FGF-2. **Advanced Healthcare Materials**, 2020.

PS Lienemann*, Q Vallmajo-Martin*, P Papageorgiou, U Blache, S Metzger, AS Kiveliö, V Milleret, A Sala, S Hoehnel, R Reuten, M Koch, O Naveiras, FR Weber, W Weber, MP Lutolf, M Ehrbar. Smart hydrogels for the augmentation of bone regeneration by endogenous skeletal stem cell recruitment. **Advanced Science**, 2020.

**Indicates equal contribution as 1st author*

BJ Klotz, LA Oosterhoff, L Utomo, KS Lim, Q Vallmajo-Martin, H Clevers, TBF Woodfield, AJWP Rosenberg, J Malda, M Ehrbar, B Spee, D Gawlitta. A versatile bio-synthetic hydrogel platform for engineering of tissue analogues. **Advanced Healthcare Materials**, 2019.

P Papageorgiou*, Q Vallmajo-Martin*, M Kisielow, A Sancho-Puchades, E Kleiner, M Ehrbar. Expanded skeletal stem and progenitor cells promote and participate in induced bone regeneration at subcritical BMP-2 dose. **Biomaterials**, 2019. **Indicates equal contribution as 1st author*

F Mushtaq, H Torlakcik, Q Vallmajo-Martin, EC Siringil, J Zhang, C Röhrig, Y Shen, Y Yu, XZ Chen, R Müller, BJ Nelson, S Pané. Magnetolectric 3D scaffolds for enhanced bone cell proliferation. **Applied Materials Today**, 2019.

P Occhetta, A Mainardi, E Votta, Q Vallmajo-Martin, M Ehrbar, I Martin, A Barbero, M Rasponi. Hyperphysiological compression of articular cartilage induces an osteoarthritic phenotype in a cartilage-on-a-chip model. **Nature Biomedical Engineering**, 2019.

HD Sparks, F Anjum, Q Vallmajo-Martin, M Ehrbar, S Abbasi, MS Kallos, J Biernaskie. Flowable polyethylene glycol hydrogels support the *in vitro* survival and proliferation of dermal progenitor cells in a mechanically dependent manner. **ACS Biomaterials Science & Engineering**, 2019.

U Blache, Q Vallmajo-Martin, E Horton, J Guerrero, Djonov, A Scherberich, I Martin, J Snedeker, V Milleret, M Ehrbar. Notch-inducing PEG-hydrogels mimic perivascular niche controlled commitment of human MSCs. **EMBO Reports**, 2018.

C Stüdle, Q Vallmajo-Martin, A Haumer, J Guerrero, M Centola, A Mehrkens, M Ehrbar, A Barbero, I Martin. Functionalized hydrogels to engineer in vivo osteochondral composites by spatially controlled induction of endochondral ossification. **Biomaterials**, 2018.

J Zimoch, J Simo-Padial, AS Klar, Q Vallmajo-Martin, M Meuli, T Biedermann, CJ Wilson, A Rowan, E Reichman. Polyisocyanopeptide hydrogels: a novel thermo-responsive hydrogel supporting pre-vascularization and the development of organotypic structures. **Acta Biomaterialia**, 2018.

PS Lienemann, T Rossow, AS Mao, Q Vallmajo-Martin, M Ehrbar, DJ Mooney. Single cell-laden protease-sensitive microniches for long-term culture in 3D. **Lab-on-a-chip**, 2017.

L Zhang, LH Cai, PS Lienemann, T Rossow, I Polenz, Q Vallmajo-Martin, M Ehrbar, H Na, DJ Mooney, DA Weitz. One-step microfluidic fabrication of polyelectrolyte microcapsules in aqueous conditions for protein release. **Angewandte Chemie**, 2016.

U Blache, S Metzger, Q Vallmajo-Martin, I Martin, V Djonov, M Ehrbar. Dual role of mesenchymal stem cells allows for microvascularized bone tissue-like environments in PEG hydrogels. **Advanced Healthcare Materials**, 2016.

Y Zhang*, R K Avery*, Q Vallmajo-Martin*, A Assmann, A Vegh, A Memic, B D Olsen, N Annabi, A Khademhosseini. A highly elastic and rapidly crosslinkable elastin-like polypeptide-based hydrogel for biomedical applications. **Advanced Functional Materials**, 2015. **Indicates equal contribution as 1st author*

R Mhana, A Kashyap, G Palazzolo, Q Vallmajo-Martin, J Becher, S Möller, M Schnabelrauch, M Zenobi-Wong. Chondrocyte Culture in 3D Alginate Sulfate Hydrogels Promotes Proliferation While Maintaining Expression of Chondrogenic Markers. **Tissue Engineering Part A**, 2014.

R Mhana, E Öztürk, Q Vallmajo-Martin, C Millan, M Müller, M Zenobi-Wong. GFOGER Modified MMP-Sensitive Polyethylene Glycol Hydrogels Induce Chondrogenic Differentiation of Human Mesenchymal Stem Cells. **Tissue Engineering Part A**, 2014.

B Vilozny, P Actis, A Seger, Q Vallmajo-Martin, N Pourmand. Reversible cation response with a Protein-modified nanopipette. **Analytical Chemistry**, 2011.

Manuscripts in preparation

Q Vallmajo-Martin, A Chiou, M Whitman, S Rojas-Sutterlin, S Giger, F Weber, B Bornhauser, O Naveiras, C Fischbach, M Lütolf, M Ehrbar. **Engineered humanized bone marrow organoids for investigating cancer osteotropism *in vivo***, submitted.

Q Vallmajo-Martin, V Lysenko, L Krattiger, A Theocharides, M Ehrbar. **Synthetic modular hydrogels foster functional expansion of human hematopoietic stem cells**.

Q Vallmajo-Martin, A Barbero, D Alpern, V Gardeux, I Martin, B Deplancke, M Lütolf, M Ehrbar. **Engineering microenvironments to interrogate human skeletal stem cell intrinsic function *in vivo***.

Conference presentations (as presenting author)

- Keystone Conference: Tissue organoids as models of host physiology and pathophysiology of disease, January 2020, Vancouver, Canada (**poster presentation**)
- TERMIS European Congress, May 2019, Rhodes, Greece (**oral presentation**)
- 25th Annual Meeting SSB+RM, May 2019, Muttens, Switzerland (**oral presentation**)
- Brupbacher Symposium: Breakthroughs in cancer research and therapy, January 2019, Zürich, Switzerland (**poster presentation**)
- TERMIS World Congress, September 2018, Kyoto, Japan (**oral presentation**)
- Biointerfaces International, August 2018, Zürich, Switzerland (**rapid fire + awarded oral presentation**)
- Keystone Conference: Novel aspects of bone biology, June 2018, Snowbird, USA (**poster presentation**)
- 24th Annual Meeting SSB+RM, June 2018, Fribourg, Switzerland (**rapid fire presentation**)
- 17th Clinical Research day USZ, April 2018, Zürich, Switzerland (**poster presentation**)
- IBI-EDBB symposium, March 2018, Lausanne, Switzerland (**oral presentation**)
- 13th SSCN meeting, September 2017, Lausanne, Switzerland (**poster presentation**)
- TERMIS European Congress, June 2017, Davos, Switzerland (**poster presentation**)

- EMBO Conference: Advances in stem cells and regenerative medicine, May 2017, Heidelberg, Germany (**poster presentation**)
- 23rd Annual Meeting SSB+RM, May 2017, Saint Gallen, Switzerland (**oral presentation**)
- 16th Clinical Research day USZ, February 2017, Zürich, Switzerland (**oral presentation**)
- Biointerfaces International, August 2016, Zürich, Switzerland (**poster presentation**)
- EPFL Bioengineering Day, September 2016, Lausanne, Switzerland (**poster presentation**)
- TERMIS European Congress, July 2016, Uppsala, Sweden (**oral presentation**)
- 22nd Annual Meeting SSB+RM, June 2016, Zürich, Switzerland (**oral presentation**)
- Young Scientists SSB+RM, February 2016, Zürich, Switzerland (**oral presentation**)

Events organization

- 26th Annual Meeting of the SSB+RM: *Biomaterials: from innovation to translation*, USZ, Zürich, CH (postponed due to COVID-19)
- 3rd Young Scientist Symposium of the SSB+RM, *Clinical translation: Challenges and Opportunities*, ETHZ, Zürich, CH (14/01/2020)
- 5th Lab and Networking event for Young Scientists at Geistlich Pharma AG, Wolhusen, CH (23/01/2019)
- 4th Lab and Networking event for Young Scientists, *Biomaterials in prevention and treatment of orthopedic device-related infections* at AO Foundation, Davos, CH (20/04/2018)
- Workshop for Young Scientists, *How to target and get the perfect job for you?* at Adolphe Merkle Institute, Fribourg, CH (06/06/2018)
- 2nd Young Scientist Symposium of the SSB+RM, USZ, Zürich, CH (21/11/2017)
- Workshop for Young Scientists, *Training for scientific writing: tips and tricks* at Empa, St. Gallen, CH (17/05/2017)
- 3rd Lab and Networking event for Young Scientists at RMS Foundation, Bettlach, CH (31/01/2017)

Distinctions and career support

- Pre-selected to the Lopez-Loreta Prize (2019)
- Nominated by thesis jury members to EPFL Doctorate Award (2019)
- Winner of the Best Poster Award at Biointerfaces International (2018)
- Traveling award for TERMIS World by the Swiss Society for Biomaterials (2018)
- Best Student Oral Presentation at 22nd SSB+RM (2016)
- Best Podium Presentation at YSBM Graduate Research Symposium (2016)
- Scholarship award from “Birkigt Scholarship Fonds” to perform the Master Thesis abroad at MIT-Harvard (2012 – 2013)
- Excellence scholarship from “La Caixa” to support the Master Studies at ETHZ (2011 – 2013)
- Valedictorian of class in Bachelor studies in Biotechnology at UAB, Barcelona (2011)
- MEC Collaboration fellowship at the “ADV vaccines”, Prof. Gòdia in UAB, Barcelona (2010 – 2011)
- CSIC grant for a lab stay in “Development of new peptides”, Dra. Reig, Barcelona (Summer 2008)
- Prize for senior thesis and participation to *Jóvenes Investigadores* congress, Málaga (Summer 2007)