

# STEFANO D. VIANELLO

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## WHO AM I?

I am a PhD student with 6 years of experience in stem cell and mouse developmental biology, with expertise in embryonic stem cell culture, synthetic embryology, and bioengineering. My main academic interests resides in endoderm and gut tube development, as well as mechanobiology and mechanical inputs to development. I am an advocate for open science, preprints, and equitable publishing. Aside from my research projects, I am interested in data communication and visual storytelling in developmental biology. I resonate with knowledge equity movements of embodied knowledge and pedagogy.

## EDUCATION

- 2017 – present      **ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE (EPFL)**      **Lausanne, CH**
- **PhD Doctoral Program** in Biotechnology and Bioengineering, with Teaching Assistantship
  - Laboratory of Stem Cell Bioengineering, with Prof M. Lütolf
  - "Endoderm development and morphogenesis in self-organising stem cell-based models of mouse embryogenesis"
  - "Characterising the mechanical and geometrical inputs of early mammalian development through bioengineered models of patterning and morphogenesis"
  - Swiss National Science Foundation Synergia Grant
- 2016-2017      **GIRTON COLLEGE, UNIVERSITY OF CAMBRIDGE**      **Cambridge, UK**
- **MPhil in Biological Science (Genetics)**
  - "Wnt and Notch (Wntch) interactions in in vitro models of preimplantation embryonic development", with Prof A. Martinez-Arias
- 2013 – 2016      **GIRTON COLLEGE, UNIVERSITY OF CAMBRIDGE**      **Cambridge, UK**
- **BA Hons Natural Sciences**
  - **3d year** (First Class Honours): Genetics (Human Genome, Genomics, SysBio; Developmental Genetics; Chromosomes & Cell cycle; Evolutionary Genetics; Plant & Microbial Genetics)
  - **2nd year** (First Class Honours): Biochemistry and Molecular Biology, Cell and Developmental Biology, Pathology
  - **1st year** (First Class Honours): Biology of Cells, Physiology of Organisms, Evolution and Behaviour, Mathematical Biology

## PUBLICATIONS

doi: <https://doi.org/10.1101/2020.06.07.138883>

**Vianello**, Lutolf, "In vitro endoderm emergence and self-organisation in the absence of extraembryonic tissues and embryonic architecture", 2020

doi: <https://doi.org/10.1101/2020.11.23.393991>

**Vianello**; "Exploring and illustrating the mouse embryo: virtual objects to think and create with", 2020

PMID: 30913407

**Vianello**, Lutolf, "Understanding the Mechanobiology of Early Mammalian Development through Bioengineered Models", 2019

## PUBLICATIONS (PROTOCOLS, DATA, SCRIPTS)

Protocol

doi: <https://dx.doi.org/10.17504/protocols.io.9j5h4q6>

**Vianello**, Girgin, Rossi, Lutolf, "Protocol to generate Gastruloids (LSCB, EPFL)". 2020

Protocol	<b>Vianello</b> , Girgin, Rossi, Lutolf; "Protocol to immunostain Gastruloids (LSCB, EPFL)". 2020	<b>doi: <a href="https://dx.doi.org/10.17504/protocols.io.7zhnlp6">https://dx.doi.org/10.17504/protocols.io.7zhnlp6</a></b>
Protocol	<b>Vianello</b> , Girgin, Rossi, Lutolf; "Protocol to culture mESCs (LSCB, UPLUT)". 2020	<b>doi: <a href="https://dx.doi.org/10.17504/protocols.io.7xbhpin">https://dx.doi.org/10.17504/protocols.io.7xbhpin</a></b>
Script	<b>Vianello</b> , Sanchez, Bercowsky-Rama, Lutolf; "Gastruloid Intensity Profiler". 2020	<b>doi: <a href="https://doi.org/10.5281/zenodo.3884237">https://doi.org/10.5281/zenodo.3884237</a></b>
Dataset	<b>Vianello</b> ; "3D models of mouse embryonic development". 2020	<b>doi: <a href="https://doi.org/10.5281/zenodo.4284379">https://doi.org/10.5281/zenodo.4284379</a></b>

## PUBLICATIONS (OTHER)

- Vianello\***, Sanchez\*; "Say "Aaaah!". Foregut development and toothed tongues in the black Katy chiton". preLights, 2021  
**doi: pending**
- Vianello\***, Sanchez\*; "Navigating change: sentinels of the sea tell about ocean health and disease.". preLights, 2021  
**doi: <https://doi.org/10.1242/prelights.26953>**
- Vianello\***, Sanchez\*; "Gastruloids, pescoids, caveoids, surfoids....In vitro embryonic models to study evo-eco-devo. New experimental approaches to cavefish development.". preLights, 2020  
**doi: <https://doi.org/10.1242/prelights.25860>**
- Vianello\***, Sanchez\*; "On the (h)edge: the germline precursors of a basal metazoa are induced at the interface between Hedgehog signalling domains". preLights, 2020  
**doi: <https://doi.org/10.1242/prelights.16775>**
- Vianello\***, Sanchez\*; "(Transiently) Comfortable in its own "skin": formation of epithelium-like multicellular structures in a unicellular organism through conserved actomyosin-dependent mechanisms". preLights, 2019  
**doi: <https://doi.org/10.1242/prelights.9812>**
- Vianello\***, Sanchez\*; "Mind the gap: epiblast geometry at its extraembryonic boundary constrains BMP localization and ensures robust gradient formation". preLights, 2019  
**doi: <https://doi.org/10.1242/prelights.6820>**

## POSTERS

04/2020	<b>BIRS-CMO WORKSHOP: "MODELLING AND ENGINEERING THE MOUSE EMBRYO"</b> Cancelled due pandemic	Oaxaca, MX
09/2019	<b>EUROPEAN SUMMER SCHOOL ON STEM CELLS AND REGENERATIVE MEDICINE</b> "Studying the mechanobiology of early mammalian development using self-organising embryonic organoids"	Hydra, EL
07/2019	<b>EMBO SYMPOSIUM: MECHANICAL FORCES IN DEVELOPMENT</b> "Altering geometry and mechanics to coax the development of self-organising embryonic organoids"	Heidelberg, DE
03/2019	<b>EMBO SYMPOSIUM: SYNTHETIC MORPHOGENESIS</b> "Altering geometry and mechanics to coax the development of self-organising embryonic organoids"	Heidelberg, DE
03/2019	<b>EMBO WORKSHOP: VISUALIZING BIOLOGICAL DATA</b> <ul style="list-style-type: none"> <li>• "Illustrating mouse development through 3D volumetric models" [<a href="https://vizbi.org/Posters/2019/D07">https://vizbi.org/Posters/2019/D07</a>]</li> <li>• "Potential" (Art &amp; Biology entry) [<a href="https://vizbi.org/Posters/2019/Y02">https://vizbi.org/Posters/2019/Y02</a>]</li> </ul>	Heidelberg, DE

## TALKS

2019	<b>PHYSICS OF LIVING SYSTEMS (INTERNAL)</b> "Squeezing, pressing, and bounding Gastruloids: mechanics and symmetry-breaking in vitro"	Lausanne, CH
2019	<b>EUROTECH SUMMER SCHOOL: OPEN SCIENCE IN PRACTICE</b> Invited speaker: "PreLights: a community-driven effort to highlighting preprints"	Lausanne, CH
2019	<b>EMBO WORKSHOP: IMAGING MOUSE DEVELOPMENT</b> "Elucidating the role of mechanical cues during peri-implantation mouse development"	Heidelberg, DE

### OTHER WORK AND RESEARCH EXPERIENCE

01-03/2016	<b>UNDERGRADUATE RESEARCH</b> <b>DEPARTMENT OF GENETICS, UNIVERSITY OF CAMBRIDGE</b>	Cambridge, UK
	<ul style="list-style-type: none"> <li>Wnt/Notch interactions in the control of mouse pre- and post-implantation development"; with Prof A. Martinez-Arias</li> <li>Investigated the role of Wnt- and Notch-signalling in early mouse embryonic development, and highlighted possible <math>\beta</math>-catenin dependent, CSL-independent, non-canonical interactions between the two pathways. Confirmed canonical roles in axial elongation and axial determination.</li> <li>Used small molecule inhibitors to generate GOF and LOF backgrounds on which to investigate signalling epistasis; strengthened expertise in 2D and 3D tissue culture, mouse Embryonic Stem Cells, live imaging of gene expression, in vitro models of early development, data processing and analysis</li> </ul>	
08 -10/2015	<b>SUMMER RESEARCH</b> <b>DEPARTMENT OF GENETICS, UNIVERSITY OF CAMBRIDGE</b>	Cambridge, UK
	<ul style="list-style-type: none"> <li>"Role of signalling in tissue specification in patterned aggregates of mouse Embryonic Stem cells"; with Prof A. Martinez-Arias</li> <li>Investigated the validity of 2i-maintained stem cell population as representative models of embryonic populations</li> <li>Awarded Wellcome Trust Biomedical Vacation Scholarship (7 weeks)</li> <li>Gained familiarity with 2D and 3D tissue culture, mouse Embryonic Stem Cells, live imaging of gene expression, in vitro models of early development (i.e. gastruloids), Fluorescence-Activated Cell Sorting, data processing and analysis</li> </ul>	
2014 – 2017	<b>VOLUNTEERING</b> <b>UNIVERSITY MUSEUM OF ZOOLOGY CAMBRIDGE</b>	Cambridge, UK
	<ul style="list-style-type: none"> <li>Actively participated in the packing, transfer, relocation, and restoration of more than 500 specimens of the museum's collections to allow for the large-scale renovation of the building.</li> <li>Effectively utilized time-management skills to evenly distribute the academic workload around more than 90 hours of volunteering, in order to successfully complete all extra-curricular tasks while obtaining First Class Honours</li> <li>Devised and introduced innovative packing techniques to deal with particularly delicate specimens of high historical, scientific, and economical value</li> </ul>	

### COMMUNITY INVOLVEMENT & RESPONSIBILITIES

2020 – present	<b>PREPRINT CURATOR</b> <b>THE COMPANY OF BIOLOGISTS</b>	
	<ul style="list-style-type: none"> <li>Curate the PreList (list of preprints) dedicated to Gastruloids on the community site of the Company of Biologists [<a href="http://tinyurl.com/ydvv59or">tinyurl.com/ydvv59or</a>]</li> </ul>	
2019 – present	<b>PRELIGHTS CONTRIBUTOR</b> <b>THE COMPANY OF BIOLOGISTS</b>	
	<ul style="list-style-type: none"> <li>Highlight preprints posted on bioRxiv, in collaboration with Paul Gerald Layague Sanchez (EMBL Heidelberg)</li> <li>Articles are posted on the Node, the community site for Developmental Biology</li> </ul>	

2016 – 2017	<b>PROJECT LEADER</b> <b>CAMBRIDGE UNIVERSITY SYNTHETIC BIOLOGY SOCIETY (CUSBS)</b>	Cambridge, UK
	<ul style="list-style-type: none"> <li>Designed and planned experimental synthetic-biology projects for students from both scientific and non-scientific backgrounds</li> <li>Currently coordinating and supervising 20 other society student members over a one-year practical project (design and introduction of synthetic genetic networks in cell-free transcription-translation systems)</li> <li>Collaborated with local community to establish a Biomakespace (innovation space for biology and biological engineering) in the old Laboratory of Molecular Biology, Cambridge;</li> <li>Liaised with University and Departmental staff for laboratory space and other administrative matters</li> </ul>	
2016	<b>MEMBER</b> <b>CAMBRIDGE UNIVERSITY SYNTHETIC BIOLOGY SOCIETY (CUSBS)</b>	Cambridge, UK
	<ul style="list-style-type: none"> <li>Participated in the design, construction, and assembly of a scanning automated microscope for high-throughput screening of multiple biological samples</li> <li>Built a Computerised Numerical Control (CNC) machine, designed 3D-printed microscope components</li> <li>Participated in the integration of Raspberry Pi/Arduino electronics, optimisation of existing software for image acquisition, and production of comprehensive hardware documentation for open access and reproducibility</li> </ul>	
<b>2016; 2017</b>		
	<b>VOLUNTEER</b> <b>CAMBRIDGE SCIENCE FESTIVAL, DEPARTMENT OF GENETICS</b>	Cambridge, UK
	<ul style="list-style-type: none"> <li><u>2017</u>: Designed and introduced in the festival a new stand dedicated to Developmental Biology (zebrafish). Introduced Virtual Reality and Augmented Reality as pedagogical tools for outreach and public engagement (virtual mouse development).</li> <li><u>2016</u>: Worked as part of a team to organise and supervise activities for both children and adults on the theme "Genes and Heredity" (building DNA models with paper or gummy bears, climbing competitions between Drosophila strains, etc...)</li> <li>Engaged with the public and presented scientific posters on Human Evolution and Comparative Genomics</li> <li>Introduced children to the field of Genetics and to the wonders of Drosophila development and mutant phenotypes</li> </ul>	
<b>TEACHING EXPERIENCE</b>		
2021	<b>EPFL ENG-629: LECTURING AND PRESENTING IN ENGINEERING</b>	Lausanne, CH
	<ul style="list-style-type: none"> <li>Practical course/workshop with theoretical component</li> <li>Informed by contemporary research on teaching engineering, designed lesson plans and practiced teaching in small classroom-like setting</li> <li>Articulation of own teaching philosophy</li> </ul>	
2020	<b>EPFL ENG-624: SCIENCE &amp; ENGINEERING TEACHING AND LEARNING</b>	Lausanne, CH
	<ul style="list-style-type: none"> <li>Introduction of research-informed approaches to teaching and learning, and concrete strategies appropriate for higher education science and technology contexts</li> </ul>	
2018-2021	<b>TEACHING ASSISTANT</b> <b>EPFL BIOENG-110 GENERAL BIOLOGY</b>	Lausanne, CH
	<ul style="list-style-type: none"> <li>Introductory biology course, led weekly exercise sessions for first year students</li> </ul>	
24,25/10/2019	<b>COURSE INSTRUCTOR</b> <b>CAMBIOSCIENCE PRACTICAL COURSE: DISCOVERING GASTRULOID</b>	Cambridge, UK
	<ul style="list-style-type: none"> <li>Invited instructor: gave lectures to workshop participants about fundamentals of mammalian embryonic development and current in vitro models used to study it</li> <li>Demonstrated mouse embryonic stem cell culture and Gastruloid generation protocol during wet lab practical sessions</li> </ul>	

10/2016; 02/2017

**DEMONSTRATOR  
UNIVERSITY OF CAMBRIDGE**

Cambridge, UK

- 2017: Introduced around 100 students over one week to zebrafish developmental biology (Biology of Cells course)
- 2017: In charge of first year students over one month of laboratory lessons (Biology of Cells course)
- 2016: Supervised undergraduate cohort during two sessions of practical experimental work (Cell & Developmental Biology course)
- Answered student questions and marked submitted work (lab write ups, reports, and answers)

**LANGUAGES**

**Italian** - native  
**French** - fluent  
**English** - fluent

**AFFILIATIONS**

**PSDB** (Philippine Society for Developmental Biology) member,  
**DORA** signatory

**HOBBIES**

**Capoeira** (acrobatic martial art; 9+ years; qualified to teach),  
**piano** (14 years), **swimming** (14 years)

**IT SKILLS**

**Web Development:** PHP, HTML, SQL, CSS  
**Programming:** R (e.g. Seurat scRNASeq analysis; FACS processing pipeline), Python/Jupyter notebooks, Binder  
**Software:** MS Office, OpenOffice, GIMP/Photoshop, Adobe Illustrator  
**Virtual Reality:** Unity, Blender, Google Cardboard (all self-taught)  
Familiarity with Unix environment