

ALBERTO RAINER – CURRICULUM VITAE

RESUME

Born in 1976, Dr. Alberto Rainer is Associate Professor of Bioengineering at the Department of Engineering, Università Campus Bio-Medico di Roma (Rome, Italy), where he is head of the Tissue Engineering Laboratory. He is also Associate Researcher at the Institute of Nanotechnology (NANOTEC), National Research Council, Italy. His academic background includes a MS degree in Materials Engineering at the University of Trieste, Italy (2002), a *post lauream* Master in Biomaterials at the Interuniversities Research Center on Materials for Biomedical Engineering (2006) and a PhD in Materials for Energy and the Environment at the University of Rome Tor Vergata, Italy (2007).

His research is in the field of nanobiotechnology and of advanced in vitro disease models exploiting bioprinting and organs-on-chip.

PERSONAL DATA

Date of birth	July 3, 1976	
Nationality	Italian	
Email	a.rainer@unicampus.it	alberto.rainer@nanotec.cnr.it
ORCID ID	0000-0001-8971-551X	

FOREIGN LANGUAGES

English	written/spoken: proficient (C2)
German	written/spoken: beginner (A2)

EDUCATION

11/2002 – 04/2007	PhD in Materials for Energy and the Environment Department of Chemical Science and Technologies, University of Rome Tor Vergata, Italy.
07/2004 – 07/2006	<i>Post lauream</i> Master in Biomaterials Interuniversities Center for Research on Materials for Biomedical Engineering.
10/1995 – 07/2002	MS degree in Materials Engineering University of Trieste, Italy.

POSTDOCTORAL TRAINING

02/2008 – 01/2010	Research Associate Center for Integrated Research, Università Campus Bio-Medico di Roma, Rome, Italy.
03/2006 – 05/2007	Research fellow Biomaterials Laboratory, Università Campus Bio-Medico di Roma.

CERTIFICATION AND LICENSURE

2003	Licensed Engineer, National Engineering Council
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ACADEMIC APPOINTMENTS

05/2020 – present	Associate Researcher
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06/2018 – present	Institute of Nanotechnology (NANOTEC), National Research Council, Lecce, Italy Associate Professor of Bioengineering Department of Engineering, Università Campus Bio-Medico di Roma, Rome, Italy
10/2017 – 12/2017	Visiting Scientist Center for translational Medicine, International Clinical Research Center St. Anne's University Hospital (ICRC-FNUSA), Brno, the Czech Republic.
01/2015 – 05/2018	Tenured Assistant Professor of Chemical Fundamentals of Technology Department of Engineering, Università Campus Bio-Medico di Roma.
03/2014 – 03/2020	Associate Researcher Institute for Photonics and Nanotechnologies, National Research Council, Rome, Italy.
2010 – 2014	Tenure-track Assistant Professor of Chemical Fundamentals of Technology Department of Engineering, Università Campus Bio-Medico di Roma.

GRANT SUPPORT

Italian Ministry of Economic Development starting in 2021
Title: PLATFORM - Materials, processes and advanced technologies for the performance, monitoring and functional validation of osteotomy procedures
Role: Investigator
Amount: € 470,000

Regione Lazio – POR FESR 2014-20 10/2020 – present
Title: Integration of high-throughput methodologies for the screening of anti-tumor antibodies - ITHACa
Role: Unit Coordinator
Amount: € 82,000

Collexion Medical Division SpA 07/2020 – present
Title: Design of innovative Protective Personal Equipment
Role: Scientific Coordinator
Amount: € 120,000

Italian Ministry of Economic Development – Competence Centers 06/2018 – present
Title: ARTES 4.0 – Industry 4.0 Competence Center on Advanced Robotics and enabling digital Technologies & Systems
Role: Vice-coordinator of the Awareness Node for Università Campus Bio-Medico

Università Campus Bio-Medico / Regional Funds for Technology Transfer 12/2017 – 04/2019
Title: Integration of High Content Screening microscopy with microfluidic perfusion.
Role: Project Coordinator
Amount: € 40,000

Italian Ministry of Health 11/2014 – 10/2018
Title: Cell-on-chip technology as a novel tool to study the interplay between cancer and the immune system: role of IRF1 and IRF8 transcription factors in melanoma as a model system.
Role: Investigator
Amount: € 69,000

Center for Integrated Research, Università Campus Bio-Medico 04/2015 – 12/2017

Title: A multi-cellular 'gut-on-chip' technology for predictive human safety testing: an integrated experimental and modeling approach.

Role: Project Coordinator

Amount: € 180,000

Italian Ministry of University

02/2014 – 01/2017

Title: Cells-on-chip technologies for the study of the endocannabinoid system in an in vitro model of tumor/immune system interaction.

Role: Investigator

Amount: € 130,000

Italy-USA Program for Scientific and Technological Cooperation

01/2014 – 12/2015

Title: Understanding the interplay between cancer stem cells and immune system: an innovative cells-on-chip approach.

Role: Investigator

Amount: € 54,000

G. Berlucci Foundation

01/2014 – 12/2015

Title: Cell on chip models to develop immunotherapy based integrated cancer therapies.

Role: Investigator

Amount: € 130,000

Italian Ministry of University

02/2013 – 02/2016

Title: Engineering physiologically and pathologically relevant organ models for the investigation of age-related diseases.

Role: Investigator

Amount: € 95,000

Italian Ministry of University, Future in Research Program

03/2012 – 08/2015

Title: Bioartificial materials and biomimetic scaffolds for stem-cells-based cardiac regeneration.

Role: Investigator

Amount: € 275,000

Center for Integrated Research, Università Campus Bio-Medico

01/2008 – 12/2010

Title: Towards tissue prototyping: fabrication of patient specific scaffolds for the regeneration of the osteochondral segment.

Role: Project Coordinator

Amount: € 180,000

COMMITTEES AND SCIENTIFIC SOCIETIES

2020 – present

Member, European Organ-on-Chip Society (EUROoCS)

2020 – present

Member of the Scientific Board, Inter-University Center for the Promotion of the 3Rs Principles in Teaching & Research (Centro 3R)

2018 – present

Founding Member, National Group for Bioengineering

2016 – present

Member, Italian Society for Biomaterials

2008 – present

Member, Italian Association of Chemistry for Engineering (AICIng)

TEACHING ACTIVITIES

AY 2017/18 – present	Course of ‘Tissue Engineering’ (held in English), MS program in Biomedical Engineering, Università Campus Bio-Medico di Roma.
AY 2012/13 – 2016/17	Course of ‘Principles of Tissue Engineering’, MS program in Biomedical Engineering, Università Campus Bio-Medico di Roma.
AY 2014/15 – present	Course of ‘Bionanotechnologies’, MS program in Biomedical Engineering, Università Campus Bio-Medico di Roma.
AY 2017/18 – present	Course of ‘Biomaterials’, MS program in Biomedical Engineering, Università Campus Bio-Medico di Roma.
AY 2014/15 – 2016/17	Course of ‘Materials Science’, BS program in Industrial Engineering, Università Campus Bio-Medico di Roma.
AY 2017/18 – present	Member of the board for the PhD Program in Sciences and Engineering for Humans and the Environment, Università Campus Bio-Medico di Roma.
AY 2016/17	Member of the board for the PhD Program in Bioengineering and Biosciences, Università Campus Bio-Medico di Roma.
AY 2013/14	Member of the board for the PhD Program in Bioengineering and Biosciences, Università Campus Bio-Medico di Roma.
2013	Member of the board for the PhD Program in Biomedical Engineering, Università Campus Bio-Medico di Roma.
2013	Member of the board for the PhD Program in Ageing and Tissue Regeneration, Università Campus Bio-Medico di Roma.
2011	Member of the board for the PhD Program in Organ Plasticity and Tissue Regeneration, Università Campus Bio-Medico di Roma.
2011	Member of the board for the PhD Program in Biomedical Engineering, Università Campus Bio-Medico di Roma.

ACADEMIC and FACILITY MANAGEMENT

03/2018 – present	Member of the Board for the Quality Assessment of Teaching, MS Program in Biomedical Engineering, Università Campus Bio-Medico di Roma.
01/2016 – present	Manager of the Radioisotopes Facility, Center for Integrated Research, Università Campus Bio-Medico di Roma.

SUPERVISORY ROLE

POST-DOC SUPERVISOR

12/2017 – 11/2018	Post-Doc supervisor Dr. Sara M. Giannitelli. Research topic: “Development of biomaterials and High Content Screening methodologies for biomedical research”. Università Campus Bio-Medico di Roma.
02/2016 – 01/2017	Post-Doc supervisor Dr. Annamaria Altomare, MD. Research topic: “Use of “gut-on-chip” technology for the prevention of drug-induced toxicity and oxidative stress”. Università Campus Bio-Medico di Roma.
02/2016 – 01/2017	Post-Doc supervisor Dr. Sara M. Giannitelli. Research topic: “Development of biomicrosystems by means of microfabrication and additive manufacturing”.

Università Campus Bio-Medico di Roma.

- 07/2015 – 06/2017 Post-Doc supervisor
Dr. Marco Costantini. Research topic: “Fabrication of cell-on-chip microfluidic devices as in vitro toxicology models”.
Università Campus Bio-Medico di Roma.
- 05/2015 – 04/2016 Post-Doc supervisor
Dr. Claudia Cicione. Research topic: “Fabrication and characterization of tissue engineered constructs to develop in vitro models of cardiac ageing”.
Università Campus Bio-Medico di Roma.
- 04/2014 – 04/2015 Post-Doc supervisor
Dr. Manuele Gori. Research topic: “Fabrication and characterization of tissue engineered constructs by a combination of bio-absorbable materials and cardiac derived cells”.
Università Campus Bio-Medico di Roma.

PhD SUPERVISOR

- 2016 Co-Advisor of the thesis “Advanced microfluidic devices mimicking the dynamic and 3D physiological microenvironment for diagnostic applications” for the PhD in Biomedical Engineering, Università Campus Bio-Medico di Roma. Candidate: Maria Chiara Simonelli.
- 2016 Co-Advisor of the thesis “Substrate engineering to control cell function” for the PhD in Biomedical Engineering, Università Campus Bio-Medico di Roma. Candidate: Franca Abbruzzese.
- 2012 Co-Advisor for the PhD thesis “Bioinspired scaffolds for regenerative medicine: production engineering and scaffold characterization” for the PhD in Biomedical Engineering, Università Campus Bio-Medico di Roma. Candidate: Sara M. Giannitelli.
- 2012 Co-Advisor for the PhD thesis “Engineering human multilayer tissues: applications in vascular and orthopedics fields” for the PhD in Biomedical Engineering, Università Campus Bio-Medico di Roma. Candidate: Matteo Centola.

BS/MS SUPERVISOR

- 2007 – present Supervisor for 41 theses for the BS in Industrial Engineering and for the BS/MS in Biomedical Engineering, Università Campus Bio-Medico di Roma.
- 2006 – present Co-supervisor for 38 theses for the BS in Industrial Engineering, for the BS/MS in Biomedical Engineering, and for the MD (Medical Doctor) Program, Università Campus Bio-Medico di Roma.

DISSEMINATION ACTIVITIES

CONFERENCE ORGANIZATION

Member of the International Scientific Committee for the 2nd International Conference “BioMaH – Biomaterials for Healthcare”. Rome, October 8-11, 2018.

Member of the Organizing Committee for the workshop “Innovation in biomedicine: advanced in vitro and in silico models”, Università Campus Bio-Medico” – Rome, May 16, 2018.

Member of the International Scientific Committee for the International Conference “BioMaH – Biomaterials for Healthcare: Biomaterials for Tissue and Genetic Engineering and the Role of Nanotechnology”. Rome, October 17-20, 2016.

Chair of the workshop "Advanced models for in vitro drug screening and toxicology". Rome, July 6, 2016.

Member of the Organizing Committee for the workshop “New technologies in Biomedicine”. Rome, December 10, 2015.

Member of the Organizing Committee for the 6th AICIng workshop. Rome, June 22-23, 2015.

INVITED SPEAKER

Invited speaker at the IPAM-ecopa Symposium. Rome, November 7-8, 2019.

Invited speaker at the “Nanoscience & nanotechnology 2019” International Conference, organized by INFN-LNF. Frascati, October 15-18, 2019.

Invited speaker at the “Advanced Physics for Medicine” symposium. Rome, September 16-18, 2019.

Invited speaker at the CME (Continuing Medical Education) training course “Alternatives to animal models” (2nd Edition), organized by IDI-IRCCS. Rome, June 3, 2019

Invited speaker at the workshop “Innovative approaches for label-free manipulation and monitoring of biological cells and tissues”. Rome, May 26, 2019

Invited speaker at the International Conference “Understanding complexity in life sciences”, Milan, February 14-15, 2019

Invited talk on “Microfabrication technologies: from scaffolds to advanced cell culture platforms”, University of Brescia Italy. September 26, 2018.

Invited speaker at the “Nanomedicine Course”, Italian Institute of Health. Rome, June 21, 2018.

Invited speaker at the “NanoInnovation 2017” Conference. Rome, September 26-29, 2017.

Invited speaker at the CME (Continuous Education in Medicine) training course “Alternatives to animal models”, organized by IDI-IRCCS. Rome, June 8, 2017.

Invited speaker at the "FINDOS Symposium 2016" organized by the Finnish Doctoral Program in Oral Sciences. Turku (Finland), December 1-2, 2016.

Invited speaker at “Nanoforum 2016”. Milan, November 13, 2016. Communication: “Microfluidics: applications in medicine”.

Invited talk on "Microtechnologies in tissue engineering", FNUSA-ICRC, Brno. October 25, 2016.

Invited speaker (plenary lecture) at the conference “Nanoscience & Nanotechnology 2016” organized by the Italian Institute for Nuclear Physics, Frascati National Labs (INFN-LNF). Frascati (RM), September 26-29, 2016.

Invited speaker at the “GioNa 2018” workshop on Nanotechnologies, Università degli Studi di Roma Tre. Rome, June 22-23, 2016.

Invited speaker (by the Italian Minister of Health) at the "Stati Generali della Ricerca Sanitaria" Conference. Rome, April 27-28, 2016.

Invited speaker at the “15th Interim Meeting of the World Federation of Neurosurgical Societies – Italian Healthcare and MedTech Chain in the field of Neuroscience”. Communication: "Additive manufacturing for tissue engineering applications". Rome, September 10-11, 2015.

Invited speaker at the workshop "Microfluidics and nanotechnologies for cell biology and tissue engineering applications". ICRC-FNUSA, Integrated Centre of Cellular Therapy. Brno, March 10-11, 2015.

Invited speaker at the conference "Stem Cells for the Bench to the Bedside: Future Perspective for Regenerative Medicine". ICRC-FNUSA, Integrated Centre of Cellular Therapy. Brno. May 6-7, 2014.

EDITORIAL ROLES

Editor of the book “Nanomaterials for Theranostics and Tissue Engineering”, Micro & Nano Technology Series, Elsevier (2020). ISBN: 9780128178386

Member of the Editorial Board of Journal of Functional Biomaterials.

Guest Editor for the Special Issue “Biomechanics and Mechanobiology at the Cell-Biomaterial Interface”, Materials (2020)

Topic Editor for the Research Topic “Physico-Chemical Control of Cell Function”, Frontiers in Physiology (2018).

Editor of the book "Computer Aided Tissue Engineering", Methods in Molecular Biology Series, Springer. doi:10.1007/978-1-0716-0611-7. In press.

Guest Editor of the Special Issue "Current developments in drug eluting devices", Drug Target Insights, 2016; 10 (S1).

PUBLICATIONS

citations: 2133 (Scopus)

H-index: 28 (Scopus)

1. M. Costantini, S. Testa, E. Fornetti, C. Fuoco, C. Sanchez Riera, M. Nie, S. Bernardini, **A. Rainer**, J. Baldi, C. Zoccali, R. Biagini, L. Castagnoli, L. Vitiello, B. Blaauw, D. Seliktar, W. Świąszkowski, P. Garstecki, S. Takeuchi, G. Cesareni, S. Cannata, C. Gargioli. Biofabricating murine and human myo-substitutes for rapid volumetric muscle loss restoration. EMBO Mol Med (2021). doi: 10.15252/emmm.202012778.

2. A.R. Perestrelo, A.C. Silva, J. Oliver-De La Cruz, F. Martino, V. Horvath, G. Caluori, O. Polanský, V. Vinarsky, G. Azzato, G. de Marco, V. Zampachova, P. Skladal, S. Pagliari, **A. Rainer**, P. Pinto-do-Ó, A. Caravella, K. Koci, D.S. Nascimento, G. Forte. Multiscale Analysis of Extracellular Matrix Remodeling in the Failing Heart. *Circulation Research* 128 (2021) 24-38. doi: 10.1161/CIRCRESAHA.120.317685.
3. M. Gori, S.M. Giannitelli, A. Zanca, P. Mozetic, M. Trombetta, **A. Rainer**. Quercetin and hydroxytyrosol as modulators of hepatic steatosis: A NAFLD-on-a-chip study. *Biotechnology and Bioengineering*. 118 (2021) 142-152. doi: 10.1002/bit.27557.
4. S. Pagliari, V. Vinarsky, F. Martino, A.R. Perestrelo, J. Oliver-De La Cruz, G. Caluori, J. Vrbsky, P. Mozetic, A. Pompeiano, A. Zanca, S.G. Ranjani, P. Skladal, D. Kytir, Z. Zdráhal, G. Grassi, M. Sampaolesi, **A. Rainer**, G. Forte. YAP-TEAD1 control of cytoskeleton dynamics and intracellular tension guides human pluripotent stem cell mesoderm specification. *Cell Death & Differentiation* (2020). doi: 10.1038/s41418-020-00643-5.
5. M. Gori, S.M. Giannitelli, M. Torre, P. Mozetic, F. Abbruzzese, M. Trombetta, E. Traversa, L. Moroni, **A. Rainer**. Biofabrication of hepatic constructs by 3D bioprinting of a cell-laden thermogel: an effective tool to assess drug-induced hepatotoxic response. *Adv Healthcare Mater* 9(21) (2020) 2001163. doi: 10.1002/adhm.202001163.
6. E. Mauri, A. Salvati, A. Cataldo, P. Mozetic, F. Basoli, F. Abbruzzese, M. Trombetta, S. Bellucci, **A. Rainer**. Graphene-laden hydrogels: a strategy for thermally triggered drug delivery. *Mater Sci Eng C*. (2020). doi: 10.1016/j.msec.2020.111353.
7. S. Scarpino, S. Taccogna, G. Pepe, E. Papini, M. D'Angelo, F. Cascone, D. Nicoletti, R. Guglielmi, A. Palermo, M. Trombetta, **A. Rainer**, C. Taffon, A. Crescenzi. Morphological and molecular assessment in thyroid cytology using cell-capturing scaffolds. *Horm Metabol Res*. (2020) doi: 10.1055/a-1157-6419.
8. M. Gori, A. Altomare, S. Cocca, E. Solida, M. Ribolsi, S. Carotti, **A. Rainer**, M. Francesconi, S. Morini, M. Cicala, M.P.L. Guarino, Palmitic acid affects intestinal epithelial barrier integrity and permeability in vitro, *Antioxidants* 9 (2020) 417. doi:10.3390/antiox9050417.
9. S. Lorenzetti, G. Aquilina, F. Caloni, E.M. Coccia, P. Cozzini, G. Cruciani, A. Fouassier, A. Gissi, L. Goracci, T. Heinonen, P. Hubert, F. Madia, F. Nevelli, **A. Rainer**, C. Rovida, A. Vitale, I. De Angelis. Non animal methodologies (NAMs): Research, testing, assessment and applications - ecopa Symposium 2019. *ALTEX* 37(2) (2020) 317. doi:10.14573/altex.2003041
10. E. Mauri, A. Rossetti, P. Mozetic, C. Schiavon, A. Sacchetti, **A. Rainer**, F. Rossi, Ester coupling of ibuprofen in hydrogel matrix: a facile one-step strategy for controlled anti-inflammatory drug release. *Eur J Pharm Biopharm* 146 (2020) 143. doi:10.1016/j.ejpb.2019.11.002
11. **A. Rainer**, G. Forte, C. Gargioli. Editorial: Physico-chemical control of cell function. *Front Physiol* 10 (2019) 00355. doi: 10.3389/fphys.2019.00355.
12. F. Basoli, S.M. Giannitelli, M. Gori, P. Mozetic, A. Bonfanti, M. Trombetta, **A. Rainer**. Biomechanical Characterization at the Cell Scale: Present and Prospects. *Front Physiol* 9 (2018) 1449.
13. E. Nocita, A. Del Giovane, M. Tiberi, L. Boccuni, D. Fiorelli, C. Sposato, E. Romano, F. Basoli, M. Trombetta, **A. Rainer**, E. Traversa, A. Ragnini-Wilson. EGFR/ErbB Inhibition Promotes OPC Maturation up to Axon Engagement by Co-Regulating PIP2 and MBP. *Cells*. 8 (2019) 844. doi: 10.3390/cells8080844.
14. C. Taffon, I. Giovannoni, P. Mozetic, G.T. Capolupo, V. La Vaccara, C. Cinque, C. Caricato, **A. Rainer**, G. Zelano, A. Crescenzi. Seriate cytology vs molecular analysis of peritoneal washing to improve gastric cancer cells detection. *Diagn. Cytopatol.* 47 (2018) 670-4. doi:10.1002/dc.24165.
15. F. Maiullari, M. Costantini, M. Milan, V. Pace, M. Chirivì, S. Maiullari, **A. Rainer**, D. Baci, H.E. Marei, D. Seliktar, C. Gargioli, C. Bearzi, R. Rizzi. A multi-cellular 3D bioprinting approach for vascularized heart tissue engineering based on HUVECs and iPSC-derived cardiomyocytes. *Sci. Rep.* 8 (2018) 13532. doi:10.1038/s41598-018-31848-x
16. N. Ditaranto, F. Basoli, M. Trombetta, N. Cioffi, **A. Rainer**, Electrospun nanomaterials implementing antimicrobial inorganic nanoparticles. *Appl. Sci.* 8 (2018) 1643. doi:10.3390/app8091643.

17. F. Vozzi, F. Logrand, M. Cabiati, C. Cicione, M. Boffito, I. Carmagnola, N. Vitale, M. Gori, M. Brancaccio, S. Del Ry, D. Gastaldi, E. Cattarinuzzi, P. Vena, **A. Rainer**, C. Domenici, G. Ciardelli, S. Sartori. Biomimetic engineering of the cardiac tissue through processing, functionalization, and biological characterization of polyester urethanes. *Biomed. Mater.* 13 (2018) 055006. doi: 10.1088/1748-605X/aaca5b.
18. M. Boffito, F. Di Meglio, P. Mozetic, S.M. Giannitelli, I. Carmagnola, C. Castaldo, D. Nurzynska, A.M. Sacco, R. Miraglia, S. Montagnani, N. Vitale, M. Brancaccio, G. Tarone, F. Basoli, **A. Rainer**, M. Trombetta, G. Ciardelli, V. Chiono, Surface functionalization of polyurethane scaffolds mimicking the myocardial microenvironment to support cardiac primitive cells. *PLoS One.* 13 (2018) e0199896. doi:10.1371/journal.pone.0199896.
19. P. Simone, C. Carusi, F. Segreto, R. Iannuzzi, S. Buscaglione, A. Gizzi, S.M. Giannitelli, **A. Rainer**, S. Filippi, P. Persichetti, Postbariatric Brachioplasty with Posteromedial Scar: Physical Model, Technical Refinements, and Clinical Outcomes. *Plast. Reconstr. Surg.* 141 (2018) 344–353. doi:10.1097/PRS.0000000000004060.
20. S.M. Giannitelli, M. Costantini, F. Basoli, M. Trombetta, **A. Rainer**, Electrospinning and microfluidics: An integrated approach for tissue engineering and cancer, in: V. Guarino, L. Ambrosio (Eds.), *Electrofluidodynamic Technol. Biomater. Med. Devices Princ. Adv.*, Woodhead Publishing, 2018: pp. 139–155. doi:10.1016/B978-0-08-101745-6.00008-6.
21. M. Costantini, J. Guzowski, P.J. Żuk, P. Mozetic, S. De Panfilis, J. Jaroszewicz, M. Heljak, M. Massimi, M. Pierron, M. Trombetta, M. Dentini, W. Świążkowski, **A. Rainer**, P. Garstecki, A. Barbetta, Electric Field Assisted Microfluidic Platform for Generation of Tailorable Porous Microbeads as Cell Carriers for Tissue Engineering. *Adv. Funct. Mater.* 28 (2018) 1800874. doi:10.1002/adfm.201800874.
22. F.R. Bertani, P. Mozetic, M. Fioramonti, M. Iuliani, G. Ribelli, F. Pantano, D. Santini, G. Tonini, M. Trombetta, L. Businaro, S. Selci, **A. Rainer**, Classification of M1/M2-polarized human macrophages by label-free hyperspectral reflectance confocal microscopy and multivariate analysis. *Sci. Rep.* 7 (2017) 8965. doi:10.1038/s41598-017-08121-8.
23. A. Gizzi, S.M. Giannitelli, M. Trombetta, C. Cherubini, S. Filippi, A. De Ninno, L. Businaro, A. Gerardino, **A. Rainer**, Computationally Informed Design of a Multi-Axial Actuated Microfluidic Chip Device. *Sci. Rep.* 7 (2017) 5489. doi:10.1038/s41598-017-05237-9.
24. S. Testa, C. Fuoco, M. Costantini, R. Belli, F. Fascetti Leon, L. Vitiello, **A. Rainer**, S. Cannata, C. Gargioli, Designing a 3D printed human derived artificial myo-structure for anal sphincter defects in anorectal malformations and adult secondary damage. *Mater. Today Commun.* 15 (2018) 120–123. doi:10.1016/j.mtcomm.2018.02.011.
25. F. Abbruzzese, F. Basoli, M. Costantini, S.M. Giannitelli, M. Gori, P. Mozetic, **A. Rainer**, M. Trombetta, Hyaluronan: an overview. *J. Biol. Regul. Homeost. Agents.* 31 (2017) 9–22. <http://www.ncbi.nlm.nih.gov/pubmed/29202559>.
26. S. Testa, M. Costantini, E. Fornetti, S. Bernardini, M. Trombetta, D. Seliktar, S. Cannata, **A. Rainer**, C. Gargioli, Combination of biochemical and mechanical cues for tendon tissue engineering. *J. Cell. Mol. Med.* 21 (2017) 2711–2719. doi:10.1111/jcmm.13186.
27. M. Costantini, S. Testa, E. Fornetti, A. Barbetta, M. Trombetta, S.M. Cannata, C. Gargioli, **A. Rainer**, Engineering Muscle Networks in 3D Gelatin Methacryloyl Hydrogels: Influence of Mechanical Stiffness and Geometrical Confinement. *Front. Bioeng. Biotechnol.* 5 (2017) 22. doi:10.3389/fbioe.2017.00022.
28. N. Celikkin, C. Rinoldi, M. Costantini, M. Trombetta, **A. Rainer**, W. Świążkowski, Naturally derived proteins and glycosaminoglycan scaffolds for tissue engineering applications. *Mater. Sci. Eng. C. Mater. Biol. Appl.* 78 (2017) 1277–1299. doi:10.1016/j.msec.2017.04.016.

29. P. Mozetic, S. Maria Giannitelli, M. Gori, M. Trombetta, **A. Rainer**, Engineering muscle cell alignment through 3D bioprinting., *J. Biomed. Mater. Res. A*. 105 (2017) 2582–2588. doi:10.1002/jbm.a.36117.
30. V. Lucarini, C. Buccione, G. Ziccheddu, F. Peschiaroli, P. Sestili, R. Puglisi, G. Mattia, C. Zanetti, I. Parolini, L. Bracci, I. Macchia, A. Rossi, M.T. D'Urso, D. Macchia, M. Spada, A. De Ninno, A. Gerardino, P. Mozetic, M. Trombetta, **A. Rainer**, L. Businaro, G. Schiavoni, F. Mattei, Combining Type I Interferons and 5-Aza-2'-Deoxycytidine to Improve Anti-Tumor Response against Melanoma. *J. Invest. Dermatol.* 137 (2017) 159–169. doi:10.1016/j.jid.2016.08.024.
31. C. Spadaccio, F. Nappi, F. De Marco, P. Sedati, C. Taffon, A. Nenna, A. Crescenzi, M. Chello, M. Trombetta, I. Gambardella, **A. Rainer**, Implantation of a Poly-L-Lactide GCSF-Functionalized Scaffold in a Model of Chronic Myocardial Infarction., *J. Cardiovasc. Transl. Res.* 10 (2017) 47–65. doi:10.1007/s12265-016-9718-9.
32. M. Costantini, S. Testa, P. Mozetic, A. Barbetta, C. Fuoco, E. Fornetti, F. Tamiro, S. Bernardini, J. Jaroszewicz, W. Świążkowski, M. Trombetta, L. Castagnoli, D. Seliktar, P. Garstecki, G. Cesareni, S. Cannata, **A. Rainer**, C. Gargioli, Microfluidic-enhanced 3D bioprinting of aligned myoblast-laden hydrogels leads to functionally organized myofibers in vitro and in vivo. *Biomaterials* 131 (2017) 98–110. doi:10.1016/j.biomaterials.2017.03.026.
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RESEARCH ACTIVITY

The research activity of Dr. Alberto Rainer is in the fields of biomaterials synthesis, tissue engineering, and disease modelling.

Biomaterials synthesis

Dr. Rainer has relevant expertise in the synthesis, functionalization and characterization of biomaterials. Specifically, Dr. Rainer's background is in the synthesis of nanostructured biomaterials, including nanotechnology-enabled advanced drug delivery systems.

Tissue engineering

Beside traditional scaffold-based tissue engineering approaches, Dr. Rainer has deepened the field of computer-aided tissue engineering through the development of additive manufacturing methods for 3D printing and bioprinting. Of note, he has contributed to the establishment of microfluidic enabled bioprinting systems that have been applied to iPSC-based tissue engineering strategies.

Disease modelling

In the field of disease modelling, Dr. Rainer is active in development of micro-engineered devices for recapitulating organ pathophysiology. These include the development of organ-on-chip devices via soft-lithographic techniques, also in combination with additive-manufacturing. These platforms represent advanced in vitro models as a potential alternative to animal models for e.g. drug prioritization testing, in line with the 3R requirements.

His achievements include the development of cancer/immune system disease models, liver pathophysiology models (specifically regarding non-alcoholic fatty liver disease), cardiac tissue models of hypoxia/reoxygenation, and intestinal barrier models.

I hereby state that the information contained in this document is correct to the best of my knowledge.

Alberto Rainer


February 16, 2021