

## SACHIKO HIROSUE, Sc.D.

Thrives in dynamic, transdisciplinary learning and growing environments.  
Enjoys hands-on methods development & teaching in academic and external laboratory practice.

A cross-pollinator, and kick-starter realizing ideas into practice.



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### Life Science Research Experience

2008-2016 Senior Scientist, Research Scientist in the laboratories of M.A. Swartz, J.A. Hubbell  
École Polytechnique Fédérale Lausanne (EPFL) Lausanne, Switzerland

#### **Developing Design Criteria of Nanoparticle Vaccines Role of Lymphatic Endothelium in Immunomodulation**

- Engineered biomaterials for nanoparticle antigen delivery in vaccination and tolerance contexts, and applied deep immunological analyses (7 publications, 4 in preparation, 1 patent in preparation)
- Demonstrated novel immunological roles of lymphatic endothelium using engineered tools (2 publications, 1 invited review, 1 manuscripts in preparation, 1 patent in preparation)
- Set up immunological methods up to immunologists' standards in an engineering laboratory
- Mentored researchers and students, Co-advisor of 2 PhD students.
- Co-wrote successfully funded 2 Swiss National Foundation (SNF) grants (194, 700k CHF 3Y each), Bill & Melinda Gates Foundation grant "Lymph Node-Targeted Biofunctionalized Nanoparticles as Adjuvants in Rationally-Designed Vaccines" (3M CHF 3Y)
- Managed the above Gates Foundation grant, 2 other projects with external collaborators
- Managed immunoengineering group of on peak average 40 people across 2 laboratories
- Trained for Animal Experiment Supervision Module 2 equivalent to FELASA Cat. C (2016)

2000-2007 Post-doctoral Fellow in the laboratory of T. Weber  
Mount Sinai School of Medicine New York, NY, U.S.A.

#### **Defining the Characteristics of Efficient Endosome Escape – gene therapy**

- Discovered and evaluated membrane active peptides by phage display
- Conjugated peptides to polycations for *in vitro* transfection
- Evaluated particle uptake and traffic *in vitro*, including Adeno-Associated Virus
- Redirected the peptide project focus from gene delivery to biochemistry (2 publications)

1994-2000 Doctoral Student in the laboratories of R.S. Langer, R.C. Mulligan  
Massachusetts Institute of Technology (MIT) Cambridge, MA, U.S.A.

#### **Development of Biodegradable Polymer Nanospheres for use in Gene Delivery**

- Developed phase inversion nanosphere formulations of plasmid DNA (1 publication)
- Obtained a currently licensed patent based on the thesis USPTO 6254890, 7/3/01
- Introduced molecular biology to the Langer Laboratory

1990-1992 Research Assistant in the laboratory of K.W. Leong  
The Johns Hopkins University Baltimore, MD, U.S.A.

#### **Phase diagram construction of streptomycin-loaded microspheres formed by complex coacervation of chondroitin-4-sulfate and gelatin – drug formulation**

1989-1990 *Research Assistant* in the laboratory of R.M. Kelly

#### **Metabolic sulfur removal from coal by thermophilic archaeobacteriae – bioremediation of coal**

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### Other Experience – in Open Science, Science & Society, Science & Art

2014.06 Session Co-Chair "The Openness Paradigm: How Synergies between Open Access, Open Data, Open Science, Open Source Hardware, Open Drug Discovery Approaches Support Development?"  
Tech4Dev International Conference UNESCO Chair in Technologies for Development What is Essential?  
Lausanne, Switzerland

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2014.06	Organizer Water Hackathon	Lausanne, Switzerland
	<ul style="list-style-type: none"> <li>-Launched a separate parallel event open and free to all especially non-academic participants</li> <li>-Negotiated full integration with the above conference</li> <li>-Kicked off a new Open Innovation space, by partnering with <a href="http://univercite.ch">univercite.ch</a> to host event</li> <li>-Successfully obtained SNF funding for presenter travel costs from the Global South (7k CHF)</li> <li>-Managed total budget (10k CHF)</li> </ul>	
2012-present	Founder, Principal Project Leader BIO-DESIGN for the REAL WORLD, EPFL <a href="http://biodesign.cc">biodesign.cc</a>	Lausanne, Switzerland
	<ul style="list-style-type: none"> <li>-Implemented a collaborative project with India and Indonesian partners and EPFL students</li> <li>-Obtained up to 20k CHF per year from the Cooperation and Development Office (2013, 2014)</li> <li>-Developed a Do-It-Yourself (DIY) prototype with an arsenic bioreporter approved for field use by the Swiss government: A120851-07</li> <li>-Organized and ran a 20 person Winter School for EU &amp; Swiss grants with UNIL collaborator</li> </ul>	
2010-present	Board Member, Active member <a href="http://hackeria.org">hackeria.org</a> : Open Source Biological Art, DIY Biology, Generic Lab Equipment International Hackeria Society	Zürich, Switzerland
	<ul style="list-style-type: none"> <li>-Developed community oriented alternative, transdisciplinary science education approaches</li> <li>-Organized open, international Do-It-Yourself (DIY) biology hack-a-thons (<math>\approx</math> 1x/year)</li> <li>-Fundraised for annual budget and individual events from cultural and industrial partners (approximately 10-30k CHF per year)</li> <li>-Active in developing content within the international network of projects in EU, US, S&amp;SE Asia</li> </ul>	
2009-2016	Course Director, Instructor Responsible Conduct in Biomedical Research, BIO664 EPFL	Lausanne, Switzerland
	<ul style="list-style-type: none"> <li>-Moderated an interactive class of 20-40 doctoral students, 2x/year</li> <li>-Selected topical case studies focusing on realistic scenarios and societal context (moodle)</li> <li>-Changed the focus on how to better the current life science research environment</li> </ul>	
2005-2008	Co-Chair, Executive Committee Member, Programming Curator Subtle Technologies Festival	Toronto, ON, Canada
	<ul style="list-style-type: none"> <li>-1 of 3 executive committee members of a 4 day international festival of Art and Science</li> <li>-Co-managed an annual budget, approximately 30k USD</li> <li>-Conceptualized and realized the scientific program of the themes: Responsive Architectures, <i>in situ</i> – art • body • medicine, and light, and managed electronic publicity campaigns</li> <li>-Structured the Program (25 speakers, including key note and round table discussions)</li> <li>-Festival publication editor (available on amazon.com &amp; pdf on <a href="http://biopoiesis.org">biopoiesis.org</a>)</li> </ul>	

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## Education

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2016	Certificate of Advanced Studies: Management of Biotech, Medtech & Pharma Ventures École Polytechnique Fédérale Lausanne	Lausanne, Switzerland
1992-2000	Sci.D, Medical Engineering and Medical Physics Massachusetts Institute of Technology, Harvard Medical School Harvard/MIT Division of Health Sciences and Technology	Cambridge, MA, U.S.A.
1988-1992	B.S., double major in Biomedical Engineering and Chemical Engineering The Johns Hopkins University	Baltimore, MD, U.S.A.

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## Interests

Volunteer public health outreach • Group facilitation • Reading • Space-making • Performance art

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