

PARTICIPANTS CATALOGUE

May 2021

Thomas Jefferson University (Jefferson) <https://www.jefferson.edu/> is an international leader in interdisciplinary, professional education. Founded in 1824 as school of medicine, in 2017, it combined with Philadelphia University, carrying the nomenclature Jefferson in its branding. Today's Jefferson represents the unification of two renowned legacies of innovation, education, research and professional excellence.

Jefferson offers undergraduate and graduate education through 10 colleges and 4 schools with programs in architecture, business, design, engineering, fashion and textiles, health, medicine and social science. More specifically, we are home of the Sidney Kimmel Medical College, the Jefferson College of Humanities & Sciences, Jefferson College of Life Sciences, Jefferson College of Rehabilitation Sciences, Jefferson College of Nursing, Jefferson College of Pharmacy, Jefferson College of Health Professions, Jefferson College of Population Health, Jefferson College of Biomedical Sciences, Kanbar College of Design, Engineering & Commerce; the School of Continuing and Professional Studies, the College of Architecture and the Built Environment, and the College of Science, Health and the Liberal Arts. The Jefferson College of Population Health is the first such designated College in the country.

We have approximately 8,200 students enrolled in more than 160 programs.

As far as medicine and clinical activity is concerned, Jefferson includes 14 hospitals, 7 urgent care centers, 19 outpatient centers, and over 40 outpatient testing & imaging centers. We treat nearly 43,000 inpatients and 1.3 million outpatients annually.

Our fashion design programs are ranked among the best in the world.

We have formed international partnerships across the globe and are working to form further sustainable, high-impact collaborations with leading Italian academic institutions.



Ignazio R. Marino

Ignazio R. Marino, MD, ScD

Professor of Surgery, Sidney Kimmel Medical College, Thomas Jefferson University
Executive Vice President for Jefferson International Innovative Strategic Ventures
Thomas Jefferson University and Jefferson Health
Executive Director, Jefferson Italy Center

1. Diane J. Abatemarco



Title & Webpage

Professor

<https://www.jefferson.edu/academics/colleges-schools-institutes/skmc/departments/obstetrics-gynecology/faculty-staff/faculty/abatemarco.html>

Organization Department

Obstetrics & Gynecology. Maternal Addiction Treatment, Education and Research (MATER)

Email

Diane.Abatemarco@jefferson.edu

Expertise/competencies/technologies/keywords

Maternal child health- implementation science, epidemiology, health services research, substance abuse, mindfulness parenting and mindfulness leadership

Horizon Europe – R&I theme of interest

Cluster 1 - Health

Specific areas/topics of interest

- Maternal child health

Which kind of contribution could we give to the areas/topics of our interest?

Dr. Abatemarco has implemented a stress reduction program among clinical and research staff. Mindfulness Dialogue for Life is a program to reduce work stress and life stress by connecting, exploring and discovering. The weekly sessions focus on work life balance, leaning in to co-workers when home life is difficult, innovative strategies to help patients engage in treatment and much more. She also conducted research in Croatia preventing early alcohol use among adolescents

Additional information (research team/useful web-links/references)

Dr. Vanessa Short (epidemiology), Dr. Meghan Gannon (maternal child health), Dr. Dennis Hand (Opioid, tobacco, pharmacotherapy). The team has implemented pediatric group well childcare including abuse and neglect prevention, mindfulness-based parenting and doula support to disadvantaged women. They also initiated family engagement in women's drug treatment. Tobacco cessation within substance use treatment and abuse disorder.

2. Parviz Ayazi-Shamlou



Title & Webpage

Vice President & Executive Director, Jefferson Institute for Bioprocessing

https://www.jefferson.edu/academics/colleges-schools-institutes/kanbar-college-of-design-engineering-commerce/research-and-innovation/institute-for-bioprocessing.html?utm_source=vanity&utm_medium=general

Organization Department

Kanbar College of Design, Engineering and Commerce, Thomas Jefferson University

Email

Parviz.ayazi-shamlou@jefferson.edu

Expertise/competencies/technologies/keywords

- Bioprocessing of:
 - Cell therapy products
 - Bioprocessing of gene therapy products
 - Bioprocessing of viral vectors
 - Bioprocessing of recombinant antigen vaccines
 - Virus like particles (VLP) vaccines
 - Monoclonal antibody therapeutics
- Biopharmaceuticals and biologics manufacture
- Bioprocess scale up, modelling, integration and intensification
- Bioprocess definition, optimization and characterization
- Process tech transfer and validation
- cGMP operations
- Computational fluid dynamics
- Process and product development
- Upstream operations
- Downstream operations
- Mammalian and microbial cell culture processes
- Preparative chromatography
- Tangential flow filtration
- Viral safety operations
- High viscosity protein formulation and stability
- Freezing and thawing of bio-therapeutics
- Analytical
- Regulatory and analytical of bio-therapeutics

Horizon Europe – R&I theme of interest

Cluster 1 - Health

Specific areas/topics of interest

- HORIZON-HLTH-2022-DISEASE-06-03-two-stage: Vaccines 2.0 - developing the next generation of vaccines
- HORIZON-HLTH-2021-DISEASE-04-07: Personalised medicine and infectious diseases: understanding the individual host response to viruses (e.g., SARS-CoV-2)

Which kind of contribution could we give to the areas/topics of our interest?

Jefferson Institute for Bioprocessing (JIB) provides education, training, process development and clinical material to support phase I and II studies that are focused on biopharmaceuticals and biologic therapeutics including:

- Legacy proteins and monoclonal antibodies
- Cell therapy
- Gene therapy
- Advanced vaccines including mRNA platform, VLPs and subunit vaccines

JIB's services are provided through a dedicated, multi-million dollar, 65,000 ft² state-of-the art facility that includes 5000 ft² of multi-modality cGMP capability, currently under construction. JIB is managed by a team of subject matters experts with considerable industry and academic experience. JIB applies first principle methods and techniques including computational process modelling, process integration and digital bioprocessing to create the scientific and engineering foundation for production of advanced bio-therapeutics. JIB's work informs and advances the strategic bioprocessing decisions needed to produce these medicines more rapidly and cost effectively, making them more affordable and accessible to large patient populations across the world to reduce the burden of human disease

Additional information (research team/useful web-links/references)

JIB Website:

https://www.jefferson.edu/academics/colleges-schools-institutes/kanbar-college-of-design-engineering-commerce/research-and-innovation/institute-for-bioprocessing.html?utm_source=vanity&utm_medium=general

JIB Scientific and technical leadership faculty and team members:

7. Dr. Cameron Bardliving – Bioprocessing operation, modelling
7. Dr. Jasbir Arora – Regulatory, Analytical and Quality Assurance
7. Thiago De Amorim Millen, MS – Downstream Process Development
7. Geoffrey Toner, MS – Vector Engineering
7. Xin Li, MS – Process Modeling and Analytics

Recent (selected) publications by JIB team members:

1. Parker, S., Bardliving, C.L., Coffman, J., Godfrey, S., Orozco, R. (2020) A novel continuous flow reactor for low pH viral inactivation, *WIPO No. WO2020076681A1*

2. Aponte-Ubillus JJ, Barajas D, Peltier J, Sterling H, Aghajanirefah A, Bardliving C, Shamlou P, Roy M, Gold D. Proteome profiling and vector yield optimization in a recombinant AAV-producing yeast model. *Microbiology Open*, 2020, 09 Nov. <https://doi.org/10.1002/mbo3.1136>
3. Burns AB, Doris C, Vehar K, Saxena V, Bardliving C, Shamlou P; Phillips MI. Novel low shear 3D bioreactor for the scaled production of high purity human mesenchymal stem cells. *PLOS ONE* (submitted)
4. Svay, K., Urrea C., Ayazi Shamlou, P., Zhang, H. CFD analysis of mixing and gas-liquid mass transfer in wave bag bioreactor, *Biotech Progress*, 2020, 18 July <https://doi.org/10.1002/btpr.3049>
5. Amadi IM, Agrawal V, Christianson T, Bardliving C, Shamlou P, LeBowitz JH. Inhibition of endogenous miR-23a/miR-377 in CHO cells enhances difficult-to-express recombinant lysosomal sulfatase activity. *Biotechnol Prog.* 2020;36(3): e2974. doi:10.1002/btpr.2974
6. Aponte-Ubillus JJ, Barajas D, Peltier J, Bardliving C, Shamlou P, Gold D. A rAAV2-producing yeast screening model to identify host proteins enhancing rAAV DNA replication and vector yield. *Biotechnol Prog.* 2019;35(1): e2725. doi:10.1002/btpr.2725
7. Aponte-Ubillus JJ, Barajas D, Peltier J, Bardliving C, Shamlou P, Gold D. Molecular design for recombinant adeno-associated virus (rAAV) vector production. *Appl Microbiol Biotechnol.* 2018;102(3):1045-1054. doi:10.1007/s00253-017-8670-1
8. Radoniqi F, Zhang H, Bardliving CL, Shamlou P, Coffman J. Computational fluid dynamic modeling of alternating tangential flow filtration for perfusion cell culture. *Biotechnol Bioeng.* 2018;115(11):2751-2759. doi:10.1002/bit.26813
9. Lim, A., Doyle, B.L., Kelly, G.M., Reed-Bogan, A.M., Breen, L.H., Shamlou, P.A., lambooy, P.K., Characterization of a cathepsin D protease from CHO cell-free medium and mitigation of its impact on the stability of a recombinant therapeutic protein, 2018, *Biotech Prog.*, 34(1),120-129
10. Cortines JR, Lima LM, Mohana-Borges R, Millen T de A, Gaspar LP, Lanman JK, Prevelige PE Jr, Silva JL. Structural insights into the stabilization of the human immunodeficiency virus type 1 capsid protein by the cyclophilin-binding domain and implications on the virus cycle. *Biochim Biophys Acta.* 2015 May;1854(5):341-8. doi: 10.1016/j.bbapap.2014.12.008.

3. Adam Bailis



Title & Webpage

Associate Dean of Research, Jefferson College of Health Professions, PhD
<http://profiles.jefferson.edu/display/20098720>

Organization Department

Jefferson College of Health Professions

Email

adam.bailis@jefferson.edu

Expertise/Competencies/technologies/Keywords

Scientific expertise in genetics, molecular biology, cell biology, biochemistry, microbiology and model systems

Horizon Europe – R&I theme of interest

Cluster 1 – Health

Specific areas/topics of interest

- Inter-professional team science in healthcare, exploiting synthetic lethality in cancer therapeutics

Which kind of contribution could we give to the areas/topics of our interest?

Educational program development, discuss use of non-human models to investigate the basis and treatment of human disease

Additional information (research team/useful web-links/references)

INTERESTS: Genetics, Molecular Biology, DNA Repair, Homologous Recombination, Cancer Genetics, Targeted Therapeutics, Chimeric Model Systems in Human Biomedical Research. I have worked extensively in the development of scientific education programs that have advanced classroom and experiential components.

4. Alok Bhushan



Title & Webpage

Professor

Chair, Department of Pharmaceutical Sciences

<https://www.jefferson.edu/academics/colleges-schools-institutes/pharmacy/faculty-staff/faculty/bhushan.html>

Organization Department

Department of Pharmaceutical Sciences

Email

alok.bhushan@jefferson.edu

Expertise/competencies/technologies/keywords

Our department has the following areas of interest: dose response, pharmacology, medicinal chemistry and pharmaceuticals including pharmacokinetics, formulation, nanotechnology and several aspects of drug development, metabolism, angiogenesis, synthesis and design of drugs, NMR and LC-MS analysis, signal transduction, cancer, SeaHorse, PCR.

Faculty work in the area of cancer and cardiac diseases including blood brain barrier and bioactive compounds from natural sources

Horizon Europe – R&I theme of interest

Cluster 1 - Health

Specific areas/topics of interest

- Drug development
- Target assessment
- Preclinical and basic analysis in clinical studies

Which kind of contribution could we give to the areas/topics of our interest?

Synthesis of analogs, pharmacology of drugs for targeted mechanism of action, LC-MS, Fluorescent Imaging, NMR, Rheometric analysis, metabolism, cell cycle analysis, PCR, pharmacokinetics, pharmacodynamics, angiogenesis.

5. Richard Derman



Title & Webpage

Associate Provost for Global Affairs

Director, Global Health Research

Professor of Obstetrics & Gynecology

<https://www.jefferson.edu/university/provost/leadership/Derman.html>

Organization Department

Office of Global Affairs

Email

richard.derman@jefferson.edu

Expertise/competencies/technologies/keywords

- Postpartum hemorrhage
- Hypertensive disorders of pregnancy
- Sepsis (maternal, infant/child)
- Exclusive breastfeeding
- Postpartum depression
- Use of mobile health tools and point of care testing
- Pandemic preparedness and surveillance
- MCH care in migrant and displaced populations
- Imaging for the early detection of TB, COVID 19 and other IDs
- Nutrition/micronutrients and in neonatal/infant neurocognitive development
- Iron deficiency anemia and adverse clinical outcomes
- Neonatal resuscitation
- Reducing the rates of unnecessary cesarean section deliveries
- Cervical, bladder and ovarian cancer prevention and early diagnosis
- Integrative medicine approaches to optimize health

Horizon Europe – R&I theme of interest

Cluster 1 - Health

Specific areas/topics of interest

Postpartum Hemorrhage, improving perinatal health outcomes, approaches for reduction of preterm births and adverse pregnancy outcomes, anemia in pregnancy

Which kind of contribution could we give to the areas/topics of our interest?

Building upon our base of successful research, we would welcome the opportunity of forming collaborations with other interested academic partners within the European Union

Additional information (research team/useful web-links/references)

Richard Derman is a Principal Investigator for the Global Network for Women's and Children's Health Research, funded by the National Institute of Child Health and Human Development; actively participated in a dozen completed Global Network trials as well as 4 which are ongoing (two having supplemental COVID-19 components). Additionally, his involvement in studies supported by the World Health Organization, the Bill and Melinda Gates Foundation, the Thrasher Research Fund, and the Children's Investment Fund Foundation has resulted in over 100 publications relative to these trials. Since the membership of the Global Network includes US-foreign partners, Dr. Derman has actively sought to promote research capacity-building at institutional partner such as Jawaharlal Nehru Medical College (JNMC), Belagavi, India and KLE University together with Thomas Jefferson University.

OTHER TEAM MEMBERS:

Dr. Patricia Henwood (Associate Professor, Emergency Medicine and Director, Global Strategic Partnerships, Office of Global Affairs)

Dr. Rupsa Boelig (Assistant Professor, Division of Maternal Fetal Medicine, Department of Obstetrics & Gynecology)

Dr. Zubair Aghai (Professor, Neonatology)

Dr. Vanessa Short (Assistant Professor, Obstetrics-Gynecology)

Dr. Patricia Kelly (Professor of Nursing)

Dr. Lauri Romanzi (Associate Clinical Professor, Department of Obstetrics & Gynecology)

Dr. Benjamin Leiby (Associate Professor, Director Biostatistics Division Pharmacology & Experimental Therapeutics)

Dr. Stephen Peiper (Professor and Chair, Pathology, Anatomy and Cell Biology)

Dr. Viraj Patwardhan (VP Academic Digital Learning)

Chris Harnish (Associate Professor, Architecture Program; Director, Health and Design Collaborative; Director, Jefferson Consortium of African Partnerships)

Dr. Amy Szjana (Professor of Nursing)

Dr. Elizabeth Krebs (Assistant Professor, Department of Emergency Medicine)

6. Robert J. Diecidue



Title & Webpage

Chair, Oral and Maxillofacial Surgery
The Cohen Reichlin Professor of Dental Biosciences
<https://hospitals.jefferson.edu/find-a-doctor/d/diecidue-robert-j.html>

Organization Department

Oral and Maxillofacial Surgery, Sidney Kimmel Medical College, Thomas Jefferson University

Email

Robert.diecidue@jefferson.edu

Expertise/competencies/Technologies/keywords

- Population Health
- Health Care Disparities
- Obstructive Sleep Apnea
- Orthognathic Surgery
- Implantology
- Maxillofacial reconstruction and bone regeneration techniques

Horizon Europe –R&I theme of interest

Cluster 1 - Health

Specific areas/topics of interest

Areas related to population health. Specifically, social economic disparities in health and healthcare, injury prevention, inequalities in access to care health disparities, obstructive sleep apnea, bone biology and reconstruction techniques of the jaw

Which kind of contribution could we give to the areas/topics of our interest?

Oral and Maxillofacial Surgery at Jefferson consists of several areas of interest with fellowship trained physicians including Obstructive Sleep Apnea, Dental Implantology, Maxillofacial Reconstruction and Bone Regeneration, Head and Neck Surgery, Conservative and Surgical Techniques for Treatment of Temporomandibular Joint Disorders, Orofacial Pain, Population Health and Health Disparities. Collaborative research in these areas with the European Union would offer a step towards generalization to the world's population

Additional information (research team/useful web-links/references)

Jefferson OMFS team members and email addresses:

Robert J Diecidue DMD MD PhD MPH MBA, Professor and Chair, robert.diecidue@jefferson.edu

Daniel Taub DDS MD, Vice Chair and Associate Professor, daniel.taub@jefferson.edu

Allen Champion DDS, Assistant Professor, allen.champion@jefferson.edu

Daniel Choi DDS MD, Assistant Professor, Fellowship in TMJ Disorders,
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Joli Chou DMD MD, Associate Professor, Fellowship in Craniofacial Surgery,
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James Gates DMD MD, Assistant Professor, Fellowship in Head and Neck Surgery,
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Shachika Khanna DDS, BDS, Assistant Professor, shachika.khanna@jefferson.edu

Alan Stiles, DMD, Assistant Professor, Fellowship in Orofacial Pain, alan.stiles@jefferson.edu

Andrew Yampolsky DDS MD, Assistant Professor, Fellowship in Head and Neck Surgery,
Andrew.yampolsky@jefferson.edu

7. Adam Dicker



Title & Webpage

Chair, Department of Radiation Oncology
Director, Jefferson Center for Digital Health

https://www.jefferson.edu/university/jmc/departments/radiation_oncology/faculty/dicker.html

Organization Department

Radiation Oncology / Center for Digital Health

Email

adam.dicker@jefferson.edu

Expertise/competencies/technologies/keywords

We have a University-wide effort in Digital Health and Data Science and founded the Jefferson Center for Digital Health & Data Science (www.jefferson.edu/digitalhealth) using the convergence of mobile technology, platforms, networks, and machine learning to improve the lives of patients and pharmaceuticals including pharmacokinetics, formulation, nanotechnology and several aspects of drug development, metabolism, angiogenesis, synthesis and design of drugs, NMR and LC-MS analysis, signal transduction, cancer, SeaHorse, PCR.

Faculty work in the area of cancer and cardiac diseases including blood brain barrier and bioactive compounds from natural sources

Horizon Europe – R&I theme of interest

Cluster 1 - Health

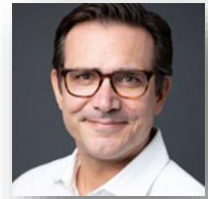
Specific areas/topics of interest

- Oncology
- Digital Health /mHealth

Which kind of contribution could we give to the areas/topics of our interest?

- Deep knowledge of oncology trials
- Machine learning tools and collaborative projects
- Extensive experience in Digital Health.

8. Robert Fryer



Title & Webpage

Associate Professor

<https://www.jefferson.edu/academics/colleges-schools-institutes/architecture-and-the-built-environment/faculty/fryer.html>

Organization Department

College of Architecture and the Built Environment

Email

Robert.fryer@jefferson.edu

Expertise/competencies/technologies/keywords

Sustainable design, adult and senior care, affordable housing, biophilic design, high performance, resilient cities, resilient communities, high performance buildings

Horizon Europe – R&I theme of interest

Cluster 5 - Climate, Energy and Mobility

Specific areas/topics of interest

- C5-D2-CS-08-2021 Zero-pollution cities
- C5-D2-CS-09-2021 Rights of persons with disabilities to participate in the life of communities and cities on equal basis with others
- C5-D2-CS-13-2022 Integrated and inclusive human-centered urban planning and design for a just, sustainable, and climate neutral cities
- C5-D2-CS-15-2022 Positive energy districts
- C5-D4-BEE-05-2022 Renewable-intensive, energy positive homes
- C5-D4-BEE-06-2022 Smarter buildings for better energy performance
- C5-D4-B4P-08-2021: More sustainable buildings with reduced embodied energy / carbon, high life-cycle performance and reduced life-cycle costs
- C5-D4-B4P-09-2021: Cost-effective, sustainable multi-functional and/or prefabricated holistic renovation packages, integrating RES and including re-used and recycled materials
- C5-D4-B4P-10-2022: Designs, materials and solutions to improve resilience, preparedness & responsiveness of the built environment for climate adaptation
- C5-D4-B4P-11-2022: Solutions for the sustainable, inclusive and accessible regeneration of neighborhoods enabling low carbon footprint lifestyles and businesses
- C5-D4-B4P-12-2022: Sustainable and resource-efficient solutions for an open, accessible, inclusive, resilient and low-carbon cultural heritage: prevention, monitoring, management, maintenance, and renovation

Which kind of contribution could we give to the areas/topics of our interest?

On C5-D2-CS-08-2021 Zero-pollution cities:

- Design of net-zero buildings
- Systems thinking applied at regional, urban, and building scales
- Material science and selection
- Affordability of residential sector

On C5-D2-CS-09-2021 Rights of persons with disabilities to participate in the life of communities and cities on equal basis with others:

- Senior care facility design

On C5-D2-CS-13-2022 Integrated and inclusive human-centered urban planning and design for a just, sustainable, and climate neutral cities

- Design of net-zero buildings
- Senior care facility design

On C5-D2-CS-15-2022 Positive energy districts:

- Design of net-zero buildings
- Systems thinking applied at regional, urban, and building scales
- Material science and selection

On C5-D4-BEE-05-2022 Renewable-intensive, energy positive homes:

- Design of net-zero homes
- Systems thinking applied at regional, urban, and building scales
- Material science and selection
- Affordability of residential sector

On C5-D4-BEE-06-2022 Smarter buildings for better energy performance:

- Design of net-zero homes
- Systems thinking applied at regional, urban, and building scales
- Material science and selection
- Affordability of residential sector
- Aging in place

On C5-D4-B4P-08-2021: More sustainable buildings with reduced embodied energy / carbon, high life-cycle performance and reduced life-cycle costs:

- Design of net-zero buildings
- LCAs
- Systems thinking applied at regional, urban, and building scales
- Material science and selection

On C5-D4-B4P-09-2021: Cost-effective, sustainable multi-functional and/or prefabricated holistic renovation packages, integrating RES and including re-used and recycled materials:

- Prefab homes
- Renovations and adaptive reuse
- Material science and selection

On C5-D4-B4P-10-2022: Designs, materials and solutions to improve resilience, preparedness & responsiveness of the built environment for climate adaptation:

- Design of net-zero and resilient buildings
- Systems thinking applied at regional, urban, and building scales
- Material science and selection

On C5-D4-B4P-11-2022: Solutions for the sustainable, inclusive and accessible regeneration of neighborhoods enabling low carbon footprint lifestyles and businesses:

- Design of net-zero and resilient buildings
- Systems thinking applied at regional, urban, and building scales
- Material science and selection
- Senior care facility design
- Aging in place

On C5-D4-B4P-12-2022: Sustainable and resource-efficient solutions for an open, accessible, inclusive, resilient and low-carbon cultural heritage: prevention, monitoring, management, maintenance, and renovation

- Renovations and adaptive reuse
- Material science and selection
- Design of net-zero buildings

Additional information (research team/useful web-links/references)

RESEARCH TEAM:

Robert Fryer, Architect, LEED AP – Sustainable architecture, urban sustainability, senior care centers, aging in place, affordable housing, reuse, renovation

Christopher Pastore, PhD – Textiles and materials science

Dave Kratzer, AIA – Architecture, senior care centers, ageing in place, social service facilities, affordable housing, reuse, renovation

Gulbin Ozcan-Deniz, PhD – Construction management, cost estimating, affordable housing

Rob Fleming, AIA, LEED AP – Sustainable architecture, urban sustainability.

9. Barbara Klinkhammer



Title & Webpage

Executive Dean, College of Architecture and the Built Environment
Professor, Le Corbusier and Color Theory

<https://www.jefferson.edu/academics/colleges-schools-institutes/architecture-and-the-built-environment/faculty/klinkhammer.html>

Organization Department

College of Architecture and the Built Environment

Email

Barbara.Klinkhammer@Jefferson.edu

Expertise/competencies/technologies/keywords

Sustainability modeling and studies, energy efficiency modeling and studies, urban design, building design, GIS, mapping, parametric designing and modeling, smart cities, materials and technologies for sustainable design

Horizon Europe – R&I theme of interest

Cluster 5 - Climate, energy and mobility

Specific areas/topics of interest

Smart and Healthy Cities:

Destination 2 – Cross-sectoral solutions for the climate transition:

- Designing inclusive, safe and sustainable urban mobility and design
- Balancing between smart, traditional and nature-based solutions and promoting justice in the urban climate transition
- Zero-pollution cities
- Rights of Persons with disabilities to participate in the life of communities and cities on equal basis with others
- Integrated and inclusive human-centered urban planning and design for a just, sustainable and climate neutral cities

Destination 4 – Efficient, sustainable and inclusive energy use:

- Advanced energy performance assessment and certification
- Renewable-intensive, energy positive homes
- Smarter buildings for better energy performance
- More sustainable buildings with reduced embodied energy /carbon, high life-cycle performance and reduced life-cycle costs

- Designs, materials and solutions to improve resilience, preparedness & responsiveness of the built environment for climate adaptation
- Solutions for the sustainable, inclusive and accessible regeneration of neighborhoods enabling low carbon footprint lifestyles and businesses
- Sustainable and resource-efficient solutions for an open, accessible, inclusive, resilient and low-carbon cultural heritage: prevention, monitoring, management, maintenance, and renovation

Which kind of contribution could we give to the areas/topics of our interest?

Building and urban design, energy performance assessment, GIS, Lidar, parametric modeling etc.

Additional information (research team/useful web-links/references)

<https://www.jefferson.edu/institute-for-smart-and-healthy-cities.html>

Also interested in Erasmus+ collaborations.

10. Elizabeth Krebs



Title & Webpage

Assistant Professor

<https://www.elizabethkrebs.com>

Organization Department

Department of Emergency Medicine; Global Affairs; School of Design and Engineering
Sidney Kimmel Medical College, Thomas Jefferson University

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Expertise/competencies/technologies/keywords

Rwanda, Africa, low- and middle- income countries, LMIC, capacity building, health equity, international development, resource constrained settings

Road safety, road traffic injury, road traffic crash, road traffic accident, collision analysis, crash reconstruction, crash prediction, crash modeling, crash prevention, powered two-wheeler safety, motorcycle crash/injury prevention, head injury biomechanics, road safety management, speed management, road safety infrastructure, safe road users, safe vehicles, post-crash care, mechanical engineering, biomedical engineering, civil engineering, industrial engineering, computer engineering, data science, artificial intelligence, machine learning, textiles design/analysis, helmet manufacturing.

Emergency care, critical care, trauma, head injury, traumatic brain injury, health systems strengthening, medical education, injury registries, point-of-care ultrasound, medical imaging, public health, population health, disaster management, Covid-19 pandemic response, vaccine effectiveness

Horizon Europe – R&I theme of interest

Cluster 1 – Health

Cluster 5 - Climate, energy and mobility

Specific areas/topics of interest

Cluster 1 - Health:

- HORIZON-HLTH-2021-DISEASE-04-03: Innovative approaches to enhance poverty-related diseases research in sub-Saharan Africa another option
- HORIZON-HLTH-2022-STAYHLTH-01-04-two-stage: Trustworthy AI tools to predict the risk of chronic non-communicable diseases and/or their progression

- HORIZON-HLTH-2021-CARE-05-01: Enhancing quality of care and patient safety
- HORIZON-HLTH-2021-CARE-05-02: Data-driven decision-support tools for better health and care delivery and policymaking

Cluster 5, Climate, energy and mobility:

- C5-D6-SAFE-03-2021: Radical improvement of road safety in low- and medium-income countries in Africa.
- C5-D3-RES-01-2021: AU-EU Water Energy Food Nexus
- C5-D3-RES-27-2022: Digital solutions for defining synergies in international renewable energy value chains
- C5-D3-RES-29-2022: AU-EU Energy System Modeling

Which kind of contribution could we give to the areas/topics of our interest?

Our research team represents broad diversity in engineering, health and social science disciplines that have come together around the critical need to reduce death and disability by improving road safety in LMICs. Within the documents linked below we have organized the myriad opportunities we see in Rwanda specifically, where the bulk of our experience and stakeholders converge.

<https://drive.google.com/file/d/1FGn9mtWHXXpKdaRf0PIb1prESbArBpFZ/view?usp=sharing>

<https://drive.google.com/file/d/1esjfV2Qg0ODOSst07S1MDMswXKQQAf3/view?usp=sharing>

Moving into Cluster 5 and mobility the document linked below describes the enormous potential held in Rwanda to achieve independence from imports, generate revenue through domestic manufacturing and export to other African countries while saving lives and preventing disability through improved prevention of head injuries among powered two-wheeler and bicycle users; all by becoming the first African country to locally produce helmets. Directly addressing Sustainable Development Goal 3.6 and dovetailing with more recent international commitments from institutions like FIA and the UNRSF, we have a fully-formed proposal that will be highly competitive for C5-D6-SAFE-03-2021, especially with integration of Italian partners.

<https://drive.google.com/file/d/1OAXg2vGRJUCv-30Lo53BGztv9S9o2oW6/view?usp=sharing>

Additional information (research team/useful web-links/references)

Jefferson has a 15-year history of Rwandan connections that Dr. Krebs has most recently focused on road traffic crash and injury prevention initiatives along with supporting emergency medicine capacity development in the country as a Fulbright Scholar.

Dr. Krebs Fogarty fellowship work while at Duke University included designing and operationalizing a head injury registry at a Kigali emergency department that considered data collection in the context of resource constraints and developing health systems. As an emergency physician she is a World Health Organization Basic Emergency Care course instructor and has written proposals with Rwandan colleagues to implement training and mentorship schemes. Apart from her global health work, domestically she has led Centers for Disease Control funded projects aimed at understanding risk of SARS-Cov-2 infection in emergency departments and real-world vaccine effectiveness evaluations

RESEARCH TEAM & PARTNERS:

Jefferson colleagues, Dr. [Chris Pastore](#) and Dr. [Efrat Kean](#), have specific competencies in:

- Design and analysis of textile materials, including structural composites and sustainability
- Development of functional textiles for a wide range of industry, including biomedical,

automotive, aerospace, architecture and athletics

- Disaster management and the Covid-19 pandemic response

Full publications of Engineer Dr. Chris Pastore

<http://orcid.org/0000-0003-4272-3808>

The Centers for Disease Control and Prevention (CDC) supported work led collaboratively by Drs. Krebs and Kean can be found at <http://prevent-project.org/> and <http://covered-study.org/>

Partners:

Healthy People Rwanda (HPR, <http://www.hprwanda.org>)

The Traffic Injury Research Foundation (TIRF, <http://www.tirf.ca>)

Motion+Momentum Forensics (<https://www.mmforensics.com>)

Insightiv (<https://insightiv.ai>)

Protec (<http://www.protec.com.vn>)

Also interested in other programmes with respect to African development and opportunities for training (masters, doctoral or fellowship programs).

11. Kihong Ku



Title & Webpage

Associate Professor, Design Technology and Architectural Innovation, Adaptive Envelopes Program Director, PhD in Architecture and Design Research

<https://www.jefferson.edu/academics/colleges-schools-institutes/architecture-and-the-built-environment/faculty/ku.html>

Organization Department

College of Architecture and the Built Environment

Email

kihong.ku@jefferson.edu

Expertise/competencies/technologies/keywords

Building technology, design technology, computational design and fabrication, building simulation, prototyping, adaptive building envelopes and human comfort

Horizon Europe – R&I theme of interest

Cluster 1 – Health

Cluster 5 - Climate, Energy and Mobility

Specific areas/topics of interest

Cluster 1 – Health:

- HORIZON-HLTH-2021-ENVHLTH-02-02: Indoor air quality and health.
- HORIZON-HLTH-2021-ENVHLTH-02-03: Health impacts of climate change, costs and benefits of action and inaction

Cluster 5 - Climate, energy and mobility:

- Climate based design strategies, energy-efficient building technology and design strategies
- C5-D4-BEE-05-2022: Renewable-intensive, energy positive homes
- C5-D4-BEE-03-2021: Advanced data-driven monitoring of building stock energy performance

Which kind of contribution could we give to the areas/topics of our interest?

Building envelope systems related innovations that enhance human health, energy efficiency, climate-based design and construction strategies, and human comfort

CLUSTER 1

HORIZON-HLTH-2021-ENVHLTH-02-02. My relevant research focuses on designing and developing adaptive building envelope systems which directly or indirectly impact interaction between indoor and outdoor air quality. I am interested in developing cost-effective, environment-friendly and scalable building envelope technologies to improve indoor air quality.

HORIZON-HLTH-2021-ENVHLTH-02-03. I am interested in developing tools for health impact and cost-benefit assessment of climate-change and mitigation measures at the urban and building scale, which integrate with various design tools including building information modeling and geospatial analysis tools

CLUSTER 5

C5-D4-BEE-05-2022. One example is design and development of an ETFE (ethylene tetrafluoroethylene) double-skin envelope for a novel energy positive residential building for the Solar Decathlon China 2021 competition. Working in cross-disciplinary multi-national, multi-university, interdisciplinary student and faculty team, I can contribute to developing a workforce program that enhances design skills and competencies for energy positive buildings in the residential sector. This encompasses aesthetic, technical, constructability, cost, human comfort and health aspects of passive and active, sustainable design and integrated design and construction of adaptive building envelopes. Solar Decathlon Project in Zhangjiakou, Hebei, China, will be completed in September 2021 and can potentially provide opportunities for a case study project

C5-D4-BEE-03-2021. Case study research on campus buildings, Solar Decathlon Project in Zhangjiakou, Hebei, China, can provide opportunities for performance monitoring

Additional information (research team/useful web-links/references)

Also interested in Erasmus+ collaborations, involving our PhD in Architecture and Design Research program.

12. Andrej Lyshchik



Title & Webpage

Associate Professor, MD, PhD,
<https://www.jefferson.edu/academics/colleges-schools-institutes/skmc/departments/radiology/faculty-staff/faculty/Lyshchik.html>

Organization Department

Department of Radiology, Thomas Jefferson University Hospital

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andrej.lyshchik@jefferson.edu

Expertise/competencies/technologies/keywords

Ovarian cancer, Ultrasound, Contrast-Enhanced Ultrasound, Cancer Imaging

Horizon Europe – R&I theme of interest

Cluster 1 - Health

Specific areas/topics of interest

- Evaluating the risk of ovarian cancer before surgery using contrast-enhanced ultrasound: prospective multicenter study

Which kind of contribution could we give to the areas/topics of our interest?

Contrast-enhanced ultrasound can provide a safe and accurate imaging method for characterization of indeterminate and suspicious ovarian masses, especially in patients with contraindications to CT and/or MRI, such as renal insufficiency, allergic reactions to contrast, claustrophobia, metallic implants or foreign bodies

Additional information (research team/useful web-links/references)

RESEARCH TEAM:

Flemming Forsberg, PhD, Professor, Department of Radiology, Director of Ultrasound Physics, Head of Research, JUREI at Thomas Jefferson University Hospital.

Research interests and expertise: Contrast enhanced ultrasound imaging, in particular subharmonic imaging and subharmonic aided pressure estimation, as well as ultrasound image processing and Elastography. <https://www.jefferson.edu/academics/colleges-schools-institutes/skmc/departments/radiology/faculty-staff/faculty/forsberg.html>

John Eisenbrey, PhD, Associate Professor of Radiology, Thomas Jefferson University Hospital
Research interests and expertise: Contrast enhanced ultrasound imaging, Cancer Imaging
Interventional Oncology, as well as ultrasound image processing and Elastography.
<https://www.jefferson.edu/academics/colleges-schools-institutes/skmc/departments/radiology/faculty-staff/faculty/eisenbrey.html>

Lab websites:

<https://www.jefferson.edu/academics/colleges-schools-institutes/skmc/departments/radiology/research/ceus-projects.html>

<https://www.jefferson.edu/academics/colleges-schools-institutes/skmc/departments/radiology/research/contrast-enhanced-ultrasound.htm>

13. Vittorio Maio



Title & Webpage

Research Professor, Jefferson College of Population Health
Managing Director, Asano-Gonnella Center for Research in Medical Education & Health Care
Director, Health Economics and Outcomes Research Fellowship, Jefferson College of Population Health

<https://www.jefferson.edu/academics/colleges-schools-institutes/skmc/research/research-medical-education/team/maio.html>

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Expertise/competencies/technologies/keywords

Research interests are in the areas of outcomes analysis and medication usage and policy, mainly looking at the appropriateness of medication prescribing and the assessment of the quality of care in inpatient and outpatient settings. Key applied research: predictive modeling to identify patients at risk of hospitalization for diseases amenable to case/disease management programs

Horizon Europe – R&I theme of interest

Cluster 1 - Health

Specific areas/topics of interest

- HORIZON-HLTH-2022-STAYHLTH-01-04-two-stage: Trustworthy AI tools to predict the risk of chronic non-communicable diseases and/or their progression
- HORIZON-HLTH-2021-CARE-05-01: Enhancing quality of care and patient safety
- HORIZON-HLTH-2021-CARE-05-02: Data-driven decision-support tools for better health and care delivery and policymaking

Which kind of contribution could we give to the areas/topics of our interest?

Our group has expertise in the following:

- working with large administrative healthcare database in Italy and US
- strong methodological, statistical, and analytical skills in health services research
- developing instruments using administrative healthcare databases to assess quality of care in both inpatient and outpatient settings

- strong capabilities in predictive modeling to identify segment of the population at risk of higher healthcare resource utilization
- significant practical experience in transforming research findings in actionable activities for quality improvement initiatives in healthcare systems

Additional information (research team/useful web-links/references)

Competencies of the Research Center: Health services research, pharmacoepidemiology, outcomes research, quality of care, empathy in patient care.

Accustomed to work with large dataset and perform complex statistical analysis, including predictive modeling

SELECTED REFERENCES:

Alcusky M, Singer M, Keith S, Hegarty S, Lombardi M, Saccenti E, Maio V. Evaluation of Care Processes and Healthcare Utilization in Newly Implemented Medical Homes in Italy: A Population-Based Cross-Sectional Study. *American Journal of Medical Quality* 2020;35(3):265-273 DOI: 10.1177/1062860619860590

Louis DZ, Callahan CA, Robeson M, Liu M, McRae J, Gonnella JS, Lombardi M, Maio V. Predicting risk of hospitalisation: a retrospective population-based analysis in a paediatric population in Emilia-Romagna, Italy. *BMJ Open* 2018;8:e019454. doi:10.1136/bmjopen-2017-019454

Varga S, Alcusky M, Keith SW, Hegarty SE, Del Canale S, Lombardi M, Maio V. Hospitalization Rates During Potentially Inappropriate Medication Use in a Large Population-Based Cohort of Older Adults. *British Journal of Clinical Pharmacology* 2017;83: 2572–2580 DOI:10.1111/bcp.13365

Louis DZ, Robeson M, McAna J, Maio V, Keith SW, Liu M, Gonnella JS, Grilli R. Predicting Risk of Hospitalization or Death: A Retrospective Population Based Analysis. *BMJ open* 2014;4: e005223. doi:10.1136/bmjopen-2014-005223

Lopatto J, Keith SW, Del Canale S, Templin M, Maio V. Evaluating Sustained Quality Improvements: Long-term Effectiveness of a Physician Focused Intervention to Reduce Potentially Inappropriate Medication Prescribing in an Older Population *Journal of Clinical Pharmacy and Therapeutics* 2014, 39, 266–271

McAna JF, Crawford AG, Novinger BW, Sidorow J, Din FM, Maio V, Louis DZ, Goldfarb NI. A Predictive Model of Hospitalization Risk among Disabled Medicaid Enrollees. *American Journal of Managed Care* 2013;19(5):e166-e174

Yuen E, Louis DZ, Cisbani L, Rabinowitz C, DePalma R, Maio V, Grilli R. Using Administrative Data to Identify and Stage Breast Cancer Cases: Implications for Assessing Quality of Care. *Tumori* 2011;97:428-435.

14. Stanton Miller



Title & Webpage

Clinical Associate Professor of Surgery

Executive Director, Jefferson Center for Injury Research and Prevention

<https://www.jefferson.edu/academics/colleges-schools-institutes/skmc/departments/surgery/divisions/acute-care/faculty/index/miller.html>

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Expertise/competencies/technologies/keywords

The Jefferson Center for Injury Research and Prevention (JCIRP) is a full research entity of the Division of Acute Care Surgery/Trauma of the Department of Surgery. Thomas Jefferson University Hospitals is a Level 1 Trauma Center (highest designation in the US). JCIRP is dedicated to the formal IRB-approved scientific study of all unintentional and intentional injuries in society. The scientific findings of our research are meant to inform policy formulation and implement evidence-based interventional strategies into communities so as to save life. JCIRP is the formally designated injury control research center of the 14 hospital Jefferson Health System. We are involved in analysis of data that spans the entire health system so as to best inform intervention strategies. Our research engages students from across the schools of our university.

We have developed major efforts in:

1) Aging Research: We are dedicated to the study of how health systems can be most effectively involved in the communities they serve so as to enable patient populations to grow old in the community in a fulfilling and safe manner. Consequently, we have developed a major program area of research in geriatric injuries, most notably elderly fall injuries. We are also dedicated to research in issues such as elder abuse and suicide.

2) Traffic-related injury: We are the only health system and injury center in the City of Philadelphia formally charged with working with the City in the study of all aspects of traffic-related injury as part of Philadelphia's Vision Zero commitment. We are involved in all aspects of data analysis by cross-sharing of our health system data with that of the Philadelphia Police Department, the City of Philadelphia Department of Transportation, and the Pennsylvania Department of Transportation.

3) Firearm Violence: We are working closely with the City of Philadelphia in the study of firearm violence. Our research has involved data collection from within our own health system and then cross-sharing with the City so as to best inform the effectiveness of planned interventions.

4) Covid, Pandemic Response, acute and deleterious effects of Climate Change: We are researching the types of community injuries that have occurred during the time of the Covid pandemic so as to best inform disaster preparedness related to pandemics and climate change.

5) Engineering Technologies for the Prevention of Injury: We are launching efforts to develop engineering technologies for the prevention of injury. Present efforts include a) Design of helmet technologies for head protection in cycling, sports, and elderly falls; b) We are involved in technologies dedicated to the issue of early detection of vehicular driver fatigue.

6) Data Science, Artificial Intelligence, Machine Learning and Injury Risk Factors: We utilize state of the art Data Science for the study of societal injury at a population health level. Principles of artificial intelligence and machine learning are utilized to identify social determinants and demographics that recognize risk factor patterns predisposing to injury

Horizon Europe – R&I theme of interest

Cluster 1 – Health

Cluster 5 – Climate, Energy and Mobility

Specific areas/topics of interest

- Horizon-Health-2021-DISEASE-04-06: Building a European partnership for pandemic preparedness
- Horizon-Health-2022-TOOL-11-02: New methods for the effective use of real-world data and/or synthetic data in regulatory decision-making and/or in health technology assessment

Which kind of contribution could we give to the areas/topics of our interest?

We are a center that is dedicated to the study of Injury Science. As such, we bring expertise in data collection related to all types of unintentional and intentional injury in society. The American College of Surgeons formally classifies injury as a surgical disease. Our center applies all concepts of disease management and control to the surgical disease of injury. Our findings then best inform strategic interventions in communities so as to reduce the human and economic burden of injury.

15. Edith Peterson Mitchell



Title & Webpage

Professor

https://www.jefferson.edu/university/jmc/departments/medical_oncology/faculty/mitchell.html

Organization Department

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Expertise/competencies/technologies/keywords

Precision Medicine in Cancer Treatment

Horizon Europe – R&I theme of interest

Cluster 1 - Health

Specific areas/topics of interest

- Improving cancer treatment outcomes

Which kind of contribution could we give to the areas/topics of our interest?

Utilizing tumor genomics and methodology

16. Timothy Mosca



Title & Webpage

Assistant Professor, Department of Neuroscience
<https://www.moscalab.org/people>

Organization Department

Department of Neuroscience, Vickie and Jack Farber Institute for Neuroscience

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Expertise/competencies/technologies/keywords

Developmental neurobiology, neuronal function, synaptic biology, neurodegenerative disease. We use state-of-the-art super-resolution microscopy, *in vivo* imaging, biochemistry, behavioral analysis, and model systems genetics to solve problems involving molecular, cellular, and developmental neuroscience in fruit fly models, cell culture, and mammalian systems

Horizon Europe – R&I theme of interest

Cluster 1 - Health

Specific areas/topics of interest

- Neurological and neuropsychiatric disorders
- Development of the brain
- Olfaction
- Behavioral coordination

Which kind of contribution could we give to the areas/topics of our interest?

In vivo work, Drosophila genetics, high resolution microscopy, biochemistry, behavioral analysis

Additional information (research team/useful web-links/references)

The Mosca Lab studies, broadly, how synaptic connections in the brain form during development and how that formation is disrupted in neurological and neurodevelopment disorders. Through understanding the fundamental aspects of how the brain is built, we can better grasp how its elegant structure is disrupted in disease and how better to repair it. Using state-of-the-art biological, genetic, and microscopic imaging technologies, we bring the power of basic science to bear on questions of translational and clinical importance. We provide an environment where science of the highest caliber can be done and where every member has the right to speak freely

and be judged on the quality of their work and their character.

We currently focus on 3 major aims:

Focus 1: Using the young brain to teach us about Alzheimer's disease

Focus 2: Sniffing out biology – using olfaction to study development and disease

Focus 3: Building new optical tools to see deeper into the functioning brain.

By combining these approaches, we can bring the best of both worlds – fundamental science and translational research - to bear on studying, understanding, and beating neurological disease.

Lab website: www.moscalab.org

17. Isidore Rigoutsos



Title & Webpage

Professor, Department of Pathology, Anatomy & Cell Biology
Director, Computational Medicine Center
<https://research.jefferson.edu/labs/researcher/rigoutsos-research.html>

Organization Department

Computational Medicine Center, Thomas Jefferson University

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Expertise/competencies/technologies/keywords

Genomics, genetics, cancer (triple negative, pancreatic, lung), health disparities, repetitive elements, short non-coding RNA (=miRNA, isomiRs, tRNA-derived fragments, rRNA-derived fragments), post-transcriptional regulation, long non-coding RNA, primate-specific RNA

Horizon Europe – R&I theme of interest

Cluster 1 - Health

Specific areas/topics of interest

- Destination 1: Staying healthy in a rapidly changing society | Provide new evidence, methodologies and tools to understand the transition from health to disease, preventing diseases and promoting health
- Destination 3: Tackling diseases and reducing disease burden | Patients should be diagnosed early and accurately and receive effective, cost-efficient and affordable treatment, including for rare diseases
- (to a lesser extent) Destination 5: Unlocking the full potential of new tools technologies and digital solutions for a healthy society)

Which kind of contribution could we give to the areas/topics of our interest?

Basic research skills and novel findings on the roles of sex-specific and ancestry-specific regulatory RNA that control mRNA abundance and are linked to diseases and disease disparities

Additional information (research team/useful web-links/references)

The Rigoutsos Lab studies the biogenesis and function of short regulatory non-coding RNAs. We discovered that the production of these RNAs, and the regulatory effect they have on messenger RNAs and protein production, depends on a person's sex, ancestry, and age, as well as on tissue type and disease type. We study how these dependencies predispose different people differently to external stimuli, in health and in disease. We also study how these short RNAs shape regulatory processes by leveraging the architecture of the human nuclear and mitochondrial genomes, the architecture of protein-coding DNA, and the numerous repetitive elements that riddle the nuclear genome. Of particular interest to the lab are non-coding RNAs that are primate-specific.

18. Matthias J. Schnell



Title & Webpage

Dr. V. Watson Pugh and Frances Plimpton Pugh Professor, PhD
Chair, Department of Microbiology and Immunology
Director Jefferson Vaccine Center

https://www.jefferson.edu/university/jmc/departments/microbiology/faculty_staff/faculty/schnell.html

Organization Department

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Expertise/competencies/technologies/keywords

Vaccines against emerging viral diseases: Rhabdovirus-based vectors as vaccines against other infectious diseases

Horizon Europe – R&I theme of interest

Cluster 1 - Health

Specific areas/topics of interest

- HORIZON-HLTH-2022-DISEASE-06-03-two-stage: Vaccines 2.0 - developing the next generation of vaccines

Which kind of contribution could we give to the areas/topics of our interest?

- We can provide several rabies-based vaccines against SARS-CoV-2, including new variants
- We have a large vaccine manufacturer in India working with us on the production of these new vaccines
- We have currently planned three-phase one studies for SARS-CoV-2, Sudan virus, and Lassa virus
- We have master virus seeds for the same platform for other emerging viruses
- Preclinical data are available for multiple vaccines
- The laboratory can produce new vaccines within 2 months
- Our vaccine is now an established platform easy to adjust to new pathogens

Additional information (research team/useful web-links/references)

The research interest of the laboratory is focused on two areas: 1) vaccine development and 2) viral pathogenesis.

Research Lab website: <https://research.jefferson.edu/labs/researcher/schnell-laboratory.html>.

Jefferson Vaccine Center: <https://research.jefferson.edu/jefferson-vaccine-center.html>.

19. Mijail Serruya



Title & Webpage

Assistant Professor, MD, PhD

<https://research.jefferson.edu/labs/researcher/serruya-research.html>

Organization Department

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Expertise/competencies/technologies/keywords

Medical device development, Neuroscience, Electrophysiology, Neurorehabilitation, Neurotechnology, Neurorestoration, Neurology, Neurosurgery, PM&R, Physical Therapy, Occupational Therapy, Industrial Design, Integrative Medicine

Horizon Europe – R&I theme of interest

Cluster 1 - Health

Specific areas/topics of interest

Our research aims to develop and test wearable and implantable neurotechnology for adults and children who live with weakness and paralysis from stroke or other neurological injury. In addition to device-based interventions, we also explore solutions based upon biological constructs such as living electrodes and neonerves

Which kind of contribution could we give to the areas/topics of our interest?

Medical device pilot trials, functional neurosurgery, neurorehabilitation

Additional information (bio sketch/research team/useful web-links/references)

RESEARCH TEAM:

Mijail Serruya, MD, PhD (Physician-scientist), Alessandro Napoli, PhD (AI Engineer), Mikael Avery, OTR/L, March (Industrial Designer, Occupational Therapist), Nicholas Satterthwaite, BS (Assistant Engineer, Software Developer), Erica Jones, BS (Trial Coordinator).

20. Edgar Stach



Title & Webpage

Professor, PhD
Director, Institute for Smart and Healthy Cities
Joint Faculty, Oak Ridge National Laboratory – ORNL
www.jefferson.edu/institute-for-smart-and-healthy-cities

Organization Department

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Expertise/competencies/technologies/keywords

High performance building envelopes, sustainability modeling and studies, energy efficiency modeling and studies, urban design, building design, mapping, parametric designing and modeling, smart cities, materials and technologies for sustainable design

Horizon Europe – R&I theme of interest

Cluster 5 - Climate, energy and mobility
Cluster 1 - Health

Specific areas/topics of interest

CLUSTER 5 - Smart and Healthy Cities

Destination 2 – Cross-sectoral solutions for the climate transition:

- Designing inclusive, safe and sustainable urban mobility and design
- Balancing between smart, traditional and nature-based solutions and promoting justice in the urban climate transition
- Zero-pollution cities
- Integrated and inclusive human-centered urban planning and design for a just, sustainable and climate neutral cities

Destination 4 – Efficient, sustainable and inclusive energy use

- Renewable-intensive, energy positive homes
- Smarter buildings for better energy performance
- Designs, materials and solutions to improve resilience, preparedness & responsiveness of the built environment for climate adaptation
- Solutions for the sustainable, inclusive and accessible regeneration of neighborhoods

enabling low carbon footprint lifestyles and businesses

CLUSTER 1 - Health

- HORIZON-HLTH-2021-ENVHLTH-02-03: Health impacts of climate change, costs and benefits of action and inaction

Which kind of contribution could we give to the areas/topics of our interest?

INTERESTS: Building and urban design, energy performance assessment, parametric modeling etc., high performance building and urban design, energy performance assessment, parametric modeling etc., high performance building envelopes.

For health-related Horizon calls, our team has expertise in empirically validated virtual cities. The team represents leading experts in computer science, building energy science, engineering, transportation, city planning and public health all of whom can collectively identify linkages among health, energy and transportation and implement them into parametric models.

TJU researchers have a particular focus on the Social Determinants of Health (SDOH) and the interrelationship between economic strain, food insecurity, housing instability, and transportation challenges, all of them play a prominent role in poor health outcomes and extensive healthcare spending.

Additional information (research team/useful web-links/references)

<https://www.jefferson.edu/institute-for-smart-and-healthy-cities.html>

21. Les Sztandera



Title & Webpage

Professor of Computer Information Systems, PhD

<https://www.jefferson.edu/academics/colleges-schools-institutes/continuing-professional-studies/degree-options/doctor-of-management-strategic-leadership/faculty/sztandera.html>

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Expertise/competencies/technologies/keywords

Computational Intelligence, Data Analytics, Computational Chemistry

Horizon Europe –R&I theme of interest

Cluster 1 – Health

Cluster 5 - Climate, Energy and Mobility

Specific areas/topics of interest

For both clusters interested in partnering with regard to:

1. Water remediation impacts on public health and the environment [could be explored from the environmental as well as medical perspective (cancer and neurological diseases preventive measures, for example)].

Project 1: Removal of lead and mercury from contaminated water to both improve public health and reduce pressure on ecosystem.

Heavy metals are naturally occurring elements that have a high atomic weight and a density at least 5 times greater than that of water. Their multiple industrial, domestic, agricultural, medical and technological applications have led to their wide distribution in the environment; raising concerns over their potential effects on human health and the environment. Their toxicity depends on several factors including the dose, route of exposure, and chemical species, as well as the age, gender, genetics, and nutritional status of exposed individuals. Because of their high degree of toxicity, arsenic, cadmium, chromium, lead, and mercury rank among the priority metals that are of public health significance.

These metallic elements are considered systemic toxicants that are known to induce multiple organ damage, even at lower levels of exposure. They are also classified as human carcinogens (known or probable) according to the U.S. Environmental Protection Agency, and the International Agency for Research on Cancer. It is estimated that several million people are exposed to arsenic alone chronically throughout the world. Exposure to arsenic occurs via the

oral route (ingestion), inhalation, dermal contact, and the parenteral route to some extent.

- We propose a research project that will support both computational modeling as well as subsequent deployment of Alkali Ash Material Permeable Reactive Barrier (AAM-PRB) into actual contaminated sites. AAM-PRB is a material developed in our laboratory made with fly ash, alkali activating solution, and filler material
- According to the US Environmental Protection Agency, water contamination poses danger to both the ecosystem and the public, especially children, in the United States and around the world
- The most common type of contaminants are heavy metals, solvents, and petroleum products. Heavy metals form the largest class of contaminants
- There exists a large body of literature that indicates the exposure to toxic heavy metals causes long-term health problems in human populations. Although the acute and chronic effects are known for some metals, little is known about the health impact of mixtures of toxic elements. Research reports have pointed out that toxic elements might interfere metabolically with nutritionally essential metals such as iron, calcium, copper, and zinc. However, the literature is scarce regarding the combined toxicity of heavy metals. Simultaneous exposure to multiple heavy metals may produce a toxic effect that is either additive, antagonistic, or synergistic
- Elucidating the mechanistic basis of heavy metal interactions is essential for health risk assessment and management of chemical mixtures. Hence, research is needed to further explain the molecular mechanisms as well as public health impact associated with human exposure to mixtures of toxic metals
- This proposed research will focus on the removal of mercury (Hg), lead (Pb) and the mixture of the two from aqueous solution using AAM-PRB. During the AAM preparation process, the starting material initially decomposed to an amorphous form, and the nucleation process of the zeolite. This conversion process transforms fly ash into zeolite with the ability to react with Pb and Hg and allow the PRB to remove the contaminant from aqueous solution
- Subsequently, an investigation of mechanisms by which Pb and Hg are removed from contaminated water will be carried out
- Installation of AAM-PRB into actual contaminated site will follow
- Long-term evaluation of the AAM-PRB will be investigated
- We intend to disseminate the research results and publish the findings in peer-reviewed journals

2. Soil amendment to produce high quality crop as well as protecting the ecosystem [could be explored from the environmental as well as medical perspective (cancer and neurological diseases preventive measures, for example)]. Using fly-ash based zeolite to phytostabilize heavy metal contaminated soils.

Project 2. Utilization of Fly-Ash Based Zeolite to phytostabilize lead and mercury contaminated soils.

Soil contaminated with heavy metals poses significant risk to terrestrial and aquatic ecosystems as well as to humans. In the United States, soils contaminated with heavy metal occur in both rural areas and urban settings from a variety of sources. Mining and smelting of nonferrous metal ores are some sources of these contaminations. Currently, soil removal in populated areas is a commonly practiced remediation technique for soil laden with heavy metals. Soil removal is labor intensive, costly, disruptive to activities of the public and requires clean soil replacement. Recently, many researchers have investigated phytoremediation, which is using plants to remediate the soil. Phytoremediation is the direct use of living plants for the in-situ remediation of contaminated soil, sludge and sediments through degradation, removal or containment. Phytoremediation can be used to clean up heavy metals, pesticides, solvents,

crude oil, explosives, and landfill leachates. Phytoremediation is divided to the sub-fields containing: phytostabilization, phytoextracion, phytodegradation, phytovolatalization, rhizofiltration, and rhizodegradation.

Phytostabilization is the focus of this investigation; it is defined as the use of certain plant species and/or soil amendment to immobilize contaminants in the soil. Soil Stabilizing Fly Ash (SSFA) material has been developed to be used as soil amendment that chelates heavy metals from contaminated soil. The soil amendment will enhance the properties of heavy metal contaminated soils and sewage sludge reducing mobilization of heavy metals by plants and reducing the danger to the environment. SSFA can be manufactured from inexpensive raw materials and is economical for use as a soil amendment. Eventual applications include hazardous site revegetation, reduction of nitrate runoff, and an inexpensive ion exchange material for control of point sources and non-point sources of pollution. The goal of this project is to determine if fly ash-based soil stabilizer, made from an abundantly available waste material, is useful as a soil amendment to encourage and work synergistically with plants to phytostabilize heavy metal (lead and mercury) contaminated soil. The work will be carried out to evaluate the potential of using SSFA technology to stabilize a mercury and lead- contaminated soil obtained from site in Pennsylvania (Palmerton Site) or any site in Italy.

- Soil bears the largest burden of environmental pollution
- Contamination of soil represents a pressing problem because the contaminants are readily bioavailable to plants and to the biotic cycle
- Soil contamination commonly caused by: Petroleum hydrocarbons, Heavy metals, Pesticides, Solvents. the contaminants are bioavailable to plants and to the biotic cycle
- Soil pollution causes reduction in soil fertility, reduce nitrogen fixation, reduce crop yield, pollution of drinking water sources, change the makeup of the soil and the types of microorganisms and finally change the whole ecosystem
- In our laboratories, we developed a new class of material called Fly Ash Based Zeolite (FABZ) made with coal ash (waste product) and readily available activating chemicals
- FABZ will be used as a soil amendment to encourage and work synergistically with plants at a significant level to phytostabilize lead and mercury from contaminated soil
- FABZ is expected to chelate heavy metal contaminants in soil, allowing revegetation that will control erosion and leaching, halting further environmental harm
- An additional benefit of the proposed technology is the recycling of coal fly ash which must be landfilled into a high value material
- Investigation of mechanisms phytostablization of soil contaminated with Pb and Hg
- Publishing the findings

Which kind of contribution could we give to the areas/topics of our interest?

We hypothesize that we will have successfully identified the first effective, economical method of removing heavy metals from water and/or soil, as well as a use for waste fly ash that otherwise would have been landfilled. The success of this new technology will affect every citizen as well as industry and government agencies

Additional information (research team/useful web-links/references)

RESEARCH TEAM:

Les Sztandera, PhD - Professor of Computer Information Systems in Jefferson's Kanbar College of Design, Engineering, and Commerce where he teaches graduate courses in competitive technical intelligence, new product development, market research, and data analytics.

As a researcher, his interests include technology and innovation management, knowledge management, computational intelligence, and neuroscience.

Dr. Sztandera specializes in research methods, data analytics, technology innovation and computational intelligence. He has successfully carried out research grants as PI, co-PI, or Senior Investigator, and subsequently published the results in peer-reviewed journals on Data Analytics and Computational Intelligence. Dr. Sztandera co-lead Artificial Intelligence and Computational Chemistry grant funded by National Science Foundation (NSF), as well as submitted proposal to North Atlantic Treaty Organization (NATO) Alliance with Dr. Rostami on Intelligent Design of Novel Reactive Barrier for Contaminated Waters, NATO Collaborative Linkage Grant.

Hossein Rostami, PhD - Professor of Materials Engineering - Areas of research interest and expertise: Environmental Science, Computational Chemistry.

He is an expert in designing permeable reactive barriers that provide efficient ways to remove heavy metals from soil and water. Dr. Rostami has been working on developing a permeable reactive barrier from fly ash that effectively removes lead and mercury. Prof. Rostami holds two environmental materials US patents: Patent # 5,601,643, "Chemically Activated Fly Ash Material", Patent # 5,454,751, "Particulate Rubber Included Concrete Compositions and has published extensively in the environmental engineering area".

A.M Rostami, MD, PhD - Dr. Rostami is an expert in diseases of the central nervous system and will contribute to the neurological diseases preventive measures path of the proposal, if it materializes.

<https://www.jefferson.edu/academics/colleges-schools-institutes/skmc/departments/neurology/faculty/rostami.html>

22. Alex Vaccaro



Title & Webpage

Richard Rothman Professor of Orthopaedic Surgery
Chair, Orthopaedic Department at Rothman Institute
President, Rothman Institute

<https://rothmanortho.com/physicians/alexander-r-vaccaro-md-phd>

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Rothman Orthopaedics Institute/ Orthopaedics

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emanuele.chisari@rothmanortho.com

Expertise/competencies/technologies/keywords

The Rothman Institute is made by professionals specialized in all areas of Orthopaedic Surgery (from Foot and Ankle, to Sports Medicine, to Spine surgery). It has worldly renowned expertise in periprosthetic joint infection prevention, diagnosis, and treatment. It is the orthopaedic department that has won more conference awards in the nation.

We managed a large consensus meeting involving over 200 nations and 800 delegates from around the world (ICM in Musculoskeletal Infections 2018). The Institute's investigators have received funding from multiple agencies, including AO, OREF, NIH, DoD, Arthritis Foundation.

250 papers are published every year in peer reviewed journals (always Q1 for orthopaedics)

KEYWORDS:

Periprosthetic joint infections

- Hip and knee replacement
- Spine surgery, Spine trauma
- Molecular diagnostic of infections
- Multiomics

Horizon Europe – R&I theme of interest

Cluster 1 - Health

Specific areas/topics of interest

- HORIZON-HLTH-DISEASE-2021-04-04: Advancing innovative Artificial Intelligence (AI)-based solutions for treatment
- HORIZON-HLTH-STAYHLTH-2022-01-two-stage-03: Personalised blueprint of chronic inflammation in Health-to-disease transition

- HORIZON-HLTH-DISEASE-2022-06-two-stage-04: Development of effective therapies for rare diseases with an unmet medical need

Which kind of contribution could we give to the areas/topics of our interest?

Full time research team experienced in preclinical, translational and clinical studies. Proven successful history in managing clinical trials, large cohort studies, and large collaboration with US and international centers. Multidisciplinary orthopaedic team, made of spine surgeons, hip and knee surgeons, shoulder surgeons, orthopaedic sports medicine surgeons, hand surgeons, F&A surgeons

Additional information (research team/useful web-links/references)

RESEARCH TEAM: Alex Vaccaro, Javad Parvizi, Chad Krueger, Yale Fillingham

Alex Vaccaro MD, PhD, MBA. <https://rothmanortho.com/physicians/alexander-r-vaccaro-md-phd>
Academic Title(s): Richard Rothman Professor of Orthopaedic Surgery, Chair of the Orthopaedic Department at Rothman Institute. President of Rothman Institute
Research interests and expertise: spine trauma, spine surgery, cervical spine

Javad Parvizi MD, FRCS. <https://rothmanortho.com/physicians/javad-parvizi-md>
Academic Title(s): James Edwards Professor of Orthopaedic Surgery, Vice Chair of Research at Rothman Institute.
Research interests and expertise: world key leader in periprosthetic joint infections, hip and knee arthroplasty, infection prevention, post-operative complications prevention

Chad Krueger, MD <https://rothmanortho.com/physicians/chad-a-krueger-md>.

Yale Fillingham, MD <https://rothmanortho.com/physicians/yale-a-fillingham-md>

Institutional website: JeffersonHealth.org/Ortho

23. Yajing Wang



Title & Webpage

Associate Professor

Director of Basic and Translational Research

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Emergency Medicine, Sidney Kimmel Medical College, Thomas Jefferson University

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Expertise/competencies/technologies/keywords

Conducted research on small animal cardiac ischemia-reperfusion surgery model and small animal cardiac microcirculatory flow evaluations

Horizon Europe – R&I theme of interest

Cluster 1 - Health

Specific areas/topics of interest

- HORIZON-HLTH-2022-STAYHLTH-01-05-two-stage: Prevention of obesity through the life course

Which kind of contribution could we give to the areas/topics of our interest?

Adipocyte dysfunction and diabetic cardiac injury: beyond metabolic dysregulation

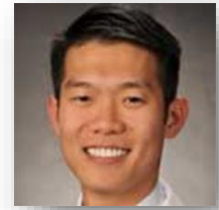
Additional information (research team/useful web-links/references)

Dr Wang is a Principal Investigator for cardiovascular research and disease therapeutic strategy program, funded by the National Institute of Health. Additionally, involved in studies supported by American Heart Association and American Diabetes Association, resulted in over 60 publications.

Dr. Wang have actively involved in research to promote research capacity-building with collaboration partners and advocate the voice for woman enrolled science in research community.

Research team included 2 cores: analytics (Dr. [Jianli Zhao](#) team leader) and protein synthesis (Dr. [Zhen Zhang](#) team leader).

24. Chengyuan Wu



Title & Webpage

Associate Professor, Co-Director, Integrated Magnetic Resonance Imaging Center
Fellowship Director for Stereotactic and Functional Neurosurgery, Division of Epilepsy & Neuromodulation Neurosurgery

<https://www.jefferson.edu/academics/colleges-schools-institutes/skmc/departments/neurosurgery/faculty/wu.html>

Organization Department

Department of Neurosurgery and Radiology

Email

Chengyuan.Wu@jefferson.edu

Expertise/competencies/technologies/keywords

Advanced MR Imaging, diffusion-based anatomical connectivity analysis, functional connectivity analysis, brain network analysis, machine learning (AI)

Horizon Europe – R&I theme of interest

Cluster 1 - Health

Specific areas/topics of interest

- HORIZON-HLTH-2022-STAYHLTH-01-04-two-stage: Trustworthy AI tools to predict the risk of chronic non-communicable diseases and/or their progression
- HORIZON-HLTH-2021-DISEASE-04-04: Clinical validation of AI solutions for treatment and care
- HORIZON-HLTH-2022-TOOL-12-01-two-stage: Computational models for new patient stratification strategies

Which kind of contribution could we give to the areas/topics of our interest?

Machine learning; AI techniques

Additional information (research team/useful web-links/references)

The Jefferson Integrated Magnetic Resonance Imaging Center is led by me and Dr. Feroze Mohamed (MR physicist). Our expertise is in advanced magnetic resonance imaging methods (such as diffusion imaging and functional imaging). Our research focuses primarily on patients with epilepsy and Parkinson's Disease. We also work with Chandrasekhar Nataraj (Villanova University) to apply machine learning and AI in the analysis of our clinical and imaging data.