Curriculum vitae

Personal information

First name, Surname:	Peter, Horvath
Date of birth:	11th October, 1980	Sex:	male
Nationality:	Hungarian
Researcher unique identifier(s) (ORCID, ResearcherID, etc.):	0000-0002-4492-1798
URL for personal website:	Peter Horvath Laboratory (u-szeged.hu)

Education

Year	Faculty/department - University/institution - Country
2023	DSc. - Hungary
2008	Ph.D. : Digital image analysis - University of Nice, Sophia Antipolis - France
2003	MSc: Computer Science, Mathematics - University of Szeged - Hungary

Positions - current and previous

Year	Job title – Employer - Country
2023-	Senior Researcher - Helmholtz Munich, AI4Health Institute, Germany
2018 -	Director – Institute of Biochemistry, Biological Research Centre (BRC) – Hungary
2017 -2023	Director – FIMM High-Content Analysis Facility (FIMM-HCA HELMI) – Finland
2014 -	Distinguished Professor Fellow – FIMM, University of Helsinki – Finland
2014 -	Research group leader – Biological Research Center, Szeged – Hungary
2007- 2013	Senior Scientist, docent – ETH, Zurich – Switzerland

Project management experience

Year	Project owner - Project - Role - Funder
2019 - 2023	BRC - Artificial intelligence driven machines for biological discoveries – PI role – HAS Lendulet Grant

2019 - 2022	BRC - CZI Deep Visual Proteomics Image guided cell characterization - coPI - Chan Zuckerberg Initiative
2021 -2022	BRC - Nerve cell phenotyping and examining their communication using artificial intelligence and the automated patch clamp system – PI role – ELKH Consortium
2021 - 2023	BRC -The proteogenomic map of tumour cell division – PI role - ELKH Excellence Programme
2021 - 2024	BRC - Intelligent inference system to support biological discovery and its application in cancer research – coPI - OTKA SNN, NRDIO
2022 - 2025	BRC - Artificial intelligence-based single cell analysis - from basic research to the bedside – PI role - Thematic Excellence Programme Grant
2022 - 2025	BRC - Discovering the cellular landscape of the airways and the lung (DisvovAIR) – coPI role - H2020 HCA Seeding
2022 - 2026	BRC - Deep learning-based methods for automatically performing patch-clamp recording on multiple neurons – coPI- NAP3 NRDIO
2022 - 2025	BRC - BIALYMP (Bispecific antibodies in Lymphoma: Microenvironmental profiling to predict treatment response and uncover immunogenic resistance mechanisms)- coPI - EU Horizon 2020, TRANSCAN2021
2022 - 2025	BRC- Fast Infrared Coherent Harmonic Microscopy (FAIR CHARM)– coPI - EU Horizon 2020
2023 - 2026	BRC - Swept laser enabled non-invasive Diagnostic tools (SWEEPICS) – coPI - EU Horizon

Supervision of students

Master's students	Ph.D. students	University/institution - Country
3	7	Institute of Biochemistry, Biological Research Centre (BRC) – Hungary

Other relevant professional experiences

Year	Description - Role
2018	Organized the NEUBIAS 2018 Szeged conference (250 participants, the largest bioimage informatics conference worldwide)
2014 – 2016	Councillor (Member of the Board of Directors) for the Society of Biomolecular Imaging and Informatics (SBI2
2010 –	Chair of the European Cell-based Assays Interest Group (EUCAI)
2008 –	Organizer and Session chair of numerous conferences, meetings, and workshops

Track record

- Peter Horvath has published 128 peer reviewed scientific articles, with an h-index of 44, cumulative impact factor of 1346, 564 and 13339 citations (Google scholar – [Peter Horvath](#)).
- Selected publications in major national or international peer-reviewed journals:

  - *An integrated cell atlas of the lung in health and disease; Sikkema, L., Ramírez-Suástegui, C., Strobl, C.D., Gillett, T. E., Zappia, L., Madissoon, E., ..., HCA Lung Biological Network* **(Horvath, P.),** *..., Nawijn, M.C., Luecken, M.D., Theis, F.,* **Nature Medicine** 29, 1563-1577, 2023

  - *Predicting compound activity from phenotypic profiles and chemical structures; Moshkov, N., Becker, T., Yang, K.,* **Horvath, P.,** *Dancik, V., ..., Carpenter, A. E., Caicedo, J. C.,* **Nature Communications 14,** 1967, 2023

  - *Cell Segmentation and Representation with Shape Priors, Hirling, D.,* **Horvath, P.,** **Computational and Structural Biotechnology Journal** 21, 742-750, 2023

  - *Fisheye transformation enhances deep-learning-based single-cell phenotyping by including cellular microenvironment, Toth, T., Bauer, D., Sukosd, F.,* **Horvath, P., Cell Reports Methods** 2, 12, 100371, 2022

  - *Nucleus segmentation: towards automated solutions; Hollandi, R., Moshkov, N., Paavolainen L., Tasnadi, E., Piccinini, F.,* **Horvath, P.** *;* **Trends in Cell Biology,** (32) 4, 2022

  - *Deep Visual Proteomics defines cell identity and heterogeneity ; Mund, A., Coscia, F., Hollandi, R., Kovacs, F., Kriston, A., Brunner, A-D., Bzorek, M., Naimy, S., Gjerdrum, L. M. R., Dyring-Andersen, B., Bulkescher, J., Lukas, C., Gnann, C., Lundberg, E.,* **Horvath, P.,** *Mann, M.,* **Nature Biotechnology** 40, 1231-1240**,** 2022

  - *Regression plane concept for analysing continuous cellular processes with machine learning*; A Szkalisity, F Piccinini, A Beleon, T Balassa, IG Varga, E Migh, C Molnar, ..., **P. Horvath**; *Nature communications* 12 (1), 1-9, 2021

  - *Chronic lung diseases are associated with gene expression programs favoring SARS-CoV-2 entry and severity; Bui, L. T., Winters, N. I., Chung, M. I., Joseph, C., Gutierrez, A. J., ..., HCA Lung Biological Network (***P. Horvath***)* **Nature communications** 12: 4314, 2021

  - *Single-cell meta-analysis of SARS-CoV-2 entry genes across tissues and demographics*; C Muus, MD Luecken, G Eraslan, L Sikkema, A Waghray, G Heimberg, ... , **P. Horvath**, ...; *Nature medicine* 27 (3), 546-559 188* 2021

  - *Automatic deep learning-driven label-free image-guided patch clamp system*; K Koos, G Oláh, T Balassa, N Mihut, M Rózsa, A Ozsvár, E Tasnadi, ... **P. Horvath**; *Nature communications* 12 (1), 1-11 2*, 2021

  - *The Human Melanoma Proteome Atlas—Complementing the melanoma transcriptome*; LH Betancourt, J Gil, A Sanchez, V Doma, M Kuras, JR Murillo, ... , **P. Horvath**, ***...; Clinical and Translational Medicine*** 11 (7), 2021

  - *The human melanoma proteome atlas—Defining the molecular pathology*; LH Betancourt, J Gil, Y Kim, V Doma, U Çakır, A Sanchez, JR Murillo, ... , **P. Horvath**, ...; ***Clinical and Translational Medicine*** 11 (7), 2021

- o *A quantitative metric for the comparative evaluation of optical clearing protocols for 3D multicellular spheroids*; A Diosdi, D Hirling, M Kovacs, T Toth, M Harmati, K Koos, K Buzas, **P. Horvath**; *Computational and structural biotechnology journal* 19, 1233-1243 2021

  o *Neuropilin-1 is a host factor for SARS-CoV-2 infection*; JL Daly, B Simonetti, K Klein, KE Chen, MK Williamson, C Antón-Plágaro, **...P. Horvath**, …; *Science* 370 (6518), 861-865, 2020

  o *AnnotatorJ: an ImageJ plugin to ease hand annotation of cellular compartments*; R Hollandi, Á Diósdi, G Hollandi, N Moshkov, **P Horváth**; *Molecular biology of the cell* 31 (20), 2179-2186, 2020

  o *SARS-CoV-2 receptor ACE2 is an interferon-stimulated gene in human airway epithelial cells and is detected in specific cell subsets across tissues*; CGK Ziegler, SJ Allon, SK Nyquist, IM Mbano, VN Miao, CN Tzouanas, ...**P. Horvath**, …; *Cell* 181 (5), 1016-1035. e19, 2020

- Software Tools
  - o Advanced Cell Classifier v1.0 (Horvath et.al.), v2.0 (Balassa et.al.), v3.0 (Szkalisity et.al.)
    www.cellclassifier.org
  - o CellTracker v0.6 (Kiss et.al.), v1.1 (Piccinini et.al.)
    www.celltracker.website
  - o FindMyCells v1.0 (Suleymanova et.al.)
    www.findmycells.org
  - o NucleAIzer (Hollandi et.al.)
    www.nucleAIzer.org
- Patents
  - o PHASECIRCLE – software deposited to the APP under the number IDDN-FR-001-280029-000-S-C-2007-000-21000, and transferred to the Joint Research Center (JRC) of the European Union.
  - o MINI-IFA – a deep learning-based fast and cheap SARS-CoV-2 serology test. *Patent filed*
  - o BIAS (Biological Image Analysis Software) – software developed by Single-Cell Technologies Inc. for single cell image analysis. *Patent filed*

- Teaching merits
  - o Overall 16 years academic teaching experience.
  - o Courses: Programming, Image Processing, Algorithms and data structures, programming languages, introduction to informatics, MatLab, Image analysis for Biologists, Protein and cell dynamics, Microscopy image analysis.
  - o Institutions: ETH Zurich, University of Harvard, Max Planck Institute, Trinity College Dublin, University of Helsinki, University of Szeged.

- Awards and honours
  - o Szent-Györgyi Talentum Prize (2019)
  - o Bolyai plaquette (2018); Bolyai Fellowship (2014)
  - o Various scientific grants by the NRDIO (National Research Development and Innovation Office)
  - o Pfizer Research Award (2016, Banerjee etal. Science)
  - o Selected and nominated by the HBS for the EBSA (European Biophysical Societies' Association) Young Investigators' Medal and Prize (2015)
  - o NAP-B brain research grant for research group establishment (4 years, Szeged, BRC)
  - o Finland Distinguished Professor award and fellowship for research group establishment (5 years, University of Helsinki, Finland)
  - o CEEPUS - Central European Exchange Program (2002, 6 months, Johannes Kepler University, Linz, Austria)

- o Marie Curie Fellowship (2007, 6 months PhD scholarship, Sophia Antipolis, France)

- International roles:
  - o Chair of the European Cell-based Assays Interest Group (EUCAI)
  - o Councilor (Board of Directors Member) for the Society of Biomolecular Imaging and Informatics (SBI2)
  - o Organizer and Session chair of numerous conferences, meetings, and workshops
  - o Main organizer of the NEUBIAS 2018 Szeged conference

- Major collaborations:
  - o ETH Zurich (Prof Ulrike Kutay, Prof Ari Helenius, Prof Yves Barral, Prof Jean-Pierre Bourquin)
  - o INRIA (Prof Josiane Zerubia, Dr Ian Jermyn)
  - o Harvard University/Broad Institute (Prof Anne Carpenter, Prof Matthias Mann)
  - o Trinity Dublin (Dr Anthony Davies)
  - o FIMM University of Helsinki (Prof Olli Kallioniemi, Prof Johan Lundin, Prof Päivi Ojala, Dr Vilja Pietiäinen, Dr Päivi Östling, Dr Caroline Heckman)
  - o BRC (Prof Laszlo Vigh, Dr Csaba Pal, Dr Balazs Papp, Dr Lajos Haracska)
  - o University of Szeged (Prof Gabor Tamas, Prof Zoltan Kato)
  - o DKFZ (Dr. Sina Oppermann)
  - o Lund University (Prof Dr Marko- Varga György)
  - o UCPH Novo Nordisk Foundation Center (Prof. Andreas Mund)

- COMMISSIONS OF TRUST
  Scientific journal and conference reviews (frequency article/year)
  - o Nature Methods (2), Nature Communications (2), eLife (1), BMC Bioinformatics (2), Oxford J. of Bioinformatics (1), Frontiers in BioEngineering (2), J. of Biomolecular Screening (3-4), J. of Microscopy (2), PLoS One (2-3), Pattern Recognition (2), IEEE Transactions in Medical Imaging (1)
  - o IEEE ICPR (3), KEPAF (3), IEEE ISBI (3)

- Grant proposal reviews
  - o Cancer Research UK, Israel Science Foundation, Sciex, Various Hungarian Grants