

Curriculum vitae, Carolina Wahlby

PERSONAL INFORMATION

Born January 31, 1974. Swedish citizen. Married (Linnman prior to marriage), three children, born 2001, 2005 and 2007.

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CURRENT POSITIONS

20140401 – **Professor** in Quantitative Microscopy, Dept. of Information Technology, Uppsala University (UU), Sweden

20170101 – **Facility director**, National SciLifeLab BioImage Informatics facility.

<https://www.scilifelab.se/facilities/bioimage-informatics/>

20180101 – **Professor, Head of research Program** (PAP), Visual Information and Interaction (including research subjects Computerized Image Processing and Human Computer Interaction), Dept. IT, UU, Sweden (http://www.it.uu.se/research/visual_information_and_interaction?lang=en)

20210201 – **Head of Research, Dept Information Technology, UU**

EDUCATION and PREVIOUS POSITIONS

1998 MSc in Molecular Biotechnology, UU

2003 PhD in Computerized Image Analysis, Dept. IT, UU

2005-2009 Postdoctoral fellow (50%) at the Dept. of Genetics & Pathology, UU

2004-2009 Assistant Professor in Digital Image Analysis (50%) the Centre for Image Analysis, UU

2009 Docent in Digital Image Processing at the Dept. of IT, UU

2009-2014 Principal Investigator, Imaging Platform, Broad Institute of Harvard and MIT, Cambridge, MA, USA (full time 20090501-20110630, part time 20110701-20141231).

2011-2014 Associate Professor (univesitetslektor) at the Div. of Visual Information and Interaction, Dept. of Information Technology, UU (part time 20110801-20140401)

2015-2017 Subject responsible Professor (FUAP), PhD studies in Computerized Processing and Analysis

2017-2020 Chairman of the Board of the Centre for Image Analysis (www.cb.uu.se), UU

COMMISSIONS OF TRUST

- Member of the Royal Academy of Engineering Sciences (IVA) www.iva.se, 2017-
- Member of the The Royal Society of Sciences at Uppsala, www.vetenskapssocietetenuppsala.se 2017-
- Member of the Scientific Advisory Board to the Wallenberg Centre for Molecular Medicine at Umeå University. 2020-
- Head of research Program (PAP), Visual Information and Interaction, Dept. IT, 2018-
- Professor responsible for research education (FUAP), Digital Image Processing and Analysis, Dept IT, 2015-2017
- Chairman of the electoral board (elektorsförsamlingen) of the faculty of Science and Technology 2019-
- Chairman of the board of the Centre for Image Analysis www.cb.uu.se, 2017-2020
- Member of the [Steering Group for the national Wallenberg](#) DDLS (Data-Driven Life Science) program, 2021-
- Board member of AIDA, a national arena for research and innovation in artificial intelligence, AI, for medical image analysis, funded through Medtech4Health and Vinnova medtech4health.se/aida, 2017-
- Board member of Swedish Bioimaging www.bioimaging.se. 2015-2018
- Board member of the National Microscopy Infrastructure, nmi.scilifelab.se, 2016-
- Board member of Upptech (Uppsala School of Technology) <http://www.upptech.uu.se>, 2016-
- Board member of the Uppsala node of SciLifeLab, www.scilifelab.se, 2016-
- Member of the Docent committee of the Faculty of Science and Technology, UU, 2017-

- Member of the scientific advisory board of EU H2020 EU MULTIMOT project (multimot.org) 2015-2018
- Member of the IEEE Bio Imaging and Signal Processing Technical Committee (BISP-TC) 2015-2017 and 2018-2020 (among other tasks, area editor and reviewer for ICASSP, ISBI and ICIP).
- Member of the scientific advisory board of French Bioimaging 2016-2018.
- Member of the scientific advisory board of Leibniz-ScienceCampi (LSC) [InfectoOptics](#), Germany
- Swedish representative of the Management Committee for COST Action CA15124, NEUBIAS on bioimage analysis, [neubias.org](#), 2016-
- Board member of the Nobel family association 2012-
- Scientific Program Chair at [BioImage Informatics 2015](#), at NIST, Gaithersburg, MD, USA.
- Associate Editor at the [IEEE International Symposium on Biomedical Imaging, ISBI 2016](#) in Prague, Czech Republic, 2016.
- Organizer of a [Special Session on Advances in Computer-Aided Histopathology](#) at [ISBI 2014](#) in Beijing, China, 2014.
- Thesis opponent (C. Stadler, KTH, F. Nellros, LTH, Q. Mahmood, Chalmers, A. Lehmussola, TUT, V. Kovacheva, University of Warwick, UK, B. Mayurathan, University of Peredeniya, Sri Lanka, Eero Lihavainen, Tampere University of Technology, Hanna Källén, Lund University, Frida Danielsson, KTH, Ali Sharif Razavian, KTH, Virginie Uhlmann, EPFL).
- Member of thesis grading committee of approximately 4 PhD thesis/year since 2011.
- Evaluator of junior- and project grant applications for the Swedish Research Council VR-NT19, 2015-2016. Vice chairman and evaluator VR-NT19 2019-2020.
- Occasional evaluator of grants of the Wallenberg foundation, Wellcome Trust and The Austrian Science Fund (FWF).
- Reviewer for a number of journals and conferences, including BMC Bioinformatics, Cytometry, Journal of Microscopy, Nature Methods, PlosONE, ICPR, ISBI, IEEE TMI, IEEE PRL.

FELLOWSHIPS, AWARDS, AND RESEARCH GRANTS (selected)

Awards:

- [Thuréus Prize 2015](#) from the Royal Society of Sciences at Uppsala. Personal prize of 0.1M SEK
- ISAC (International Society for the Advancement of Cytometry) Scholar 2014-2018
- President's Innovation award 2014, Society of Biomolecular Imaging and Informatics

Research grants as PI:

- SSF Big Data grant on 'Hierarchical Analysis of Temporal and Spatial Image Data - From intelligent data acquisition via smart data-management to confident predictions', 2017-2022. Role: PI (29M SEK). Industrial partners: Astra Zeneca and Vironova AB.
- ERC consolidator grant 'TissueMaps' 2016-2020. Role: PI (16M SEK). Focus: Integrating spatial and genetic information via automated image analysis and interactive visualization of tissue data.
- Swedish Research Council Young Investigator grant 'A flexible automated cell tracking system optimized on an application basis by user-controlled feedback' (2013-2017). Role: PI (2.452M SEK)
- Grant from eSENCE 'Large-scale analysis of live cells' (2012-2014). Role: PI (1M SEK)
- NIH, NIGMS, grant 1R01 GM095672-01 'Image analysis for high-throughput C. elegans infection and metabolism assays' (2011-2015). Role: PI (10M SEK)
- 'Strategic recruitment' of SciLifeLab Sweden (2011-2015). Role: PI (9 MSEK)
- NordForsk PrivatePublicPartnership PhD Program Grant. (2009-2012) Role: Academic PI, Industrial partner Visiopharm a/s Denmark

Research grants as co-PI:

- SSF Agenda 2030 Research Centers (ARC) grant 'Ultrafast bacterial species identification and antibiotic susceptibility testing', (2021-2025) Role: co-PI with Dan I Andersson (50M SEK)

- Swedish Research Council project grant 'Discovery of novel immune-regulatory mechanisms through spatial and functional characterization of immune cells and PDGFR-defined subsets of fibroblasts' (2021-2024). Role: Co-PI with A. Östman.
- Swedish Research Council project grant 'Enabling Systematic Phenotypic Cell Profiling in Safety Pharmacology' (2021-2023). Role: Co-PI, with O.Spjuth.
- Karolinska Institutet block grant 'Functional characteristics of cervical mucosal CD8+ tissue resident memory T cells with different antigenic specificities' (2020-2023). Role: co-PI with A.Tjernlund (1.24M SEK)
- Swedish Research Council project grant 'The prostate cancer image epidemiology project: development and validation of model-based histopathology' (2019-2023). Role: co-PI with M.Rantalainen (4.8M SEK)
- Formas - future research leaders grant 'Exploring toxicity mechanisms for environmental contaminants using an AI-controlled automated laboratory' (2019-2021). Role: co-PI, with Ola Spjuth.
- SSF Systems Biology grant 'Development and application of systems microscopy for cancer cell migration' (2017-2022). Role: co-PI, with S. Strömblad, KI (35M SEK). Industrial partners: Olink Bioscience AB and Sprint Bioscience AB.
- Swedish Research Council Collaboration Grant 'Sparse modelling and deep learning for improved Fourier ptychographic microscopy with biomedical applications' (2017-2021). co-PI, with J. Lindblad.
- Vinnova Analytic Imaging Diagnostic Arena (AIDA), 2017-2019 + 2020, Role: board member and key contributor, PI: Claes Lundström, LiU/Sectra (20+16MSEK) + co-PI of sub-project 'Image- and AI-based cytological cancer screening', with PI J. Lindblad (0.4 MSEK). Industrial partners: Sectra AB, Spectronic Medical AB. Focus: To approach today's care challenges within imaging diagnostics by use of modern AI technology aiming for broad benefit for healthcare.
- Swedish Research Council project grant 'Sparse modelling and deep learning for improved Fourier ptychographic microscopy with biomedical applications' (2017-2021). Role: co-PI with J. Lindblad (3.84M SEK)
- Swedish Research Council 'Regional Orthogonal Moments for Texture Analysis: Applications in Microscopy Image Analysis' (2015 – 2018) co-Pi with I-M. Sintorn (3.643 MSEK)
- AstraZeneca/SciLifeLab-Research Collaboration Grant 'The SciLifeLab cancer stem cell program: systems-scale analysis and prospective modeling of cancer stem cells from patients' (2013-2019). co-PI, with S. Nelander (32.5M SEK)
- Swedish Research Council 'Medical image analyser for cervical cancer prescreening' (2012-2014) co-PI with E. Bengtsson (0.654M SEK)
- Swedish Research Council '3D analysis of chromatin texture in cell nuclei to improve cervical cancer screening' (2009-2011) co-PI, with E. Bengtsson (2.1M SEK)
- Swedish Research Council Collaboration Grant (2001-2010). co-PI, with M. Nilsson & NG. Larsson

SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS

Main supervisor for

- Amalka Pinidiyaarachchi, PhD 2009, ["Digital Image Analysis of Cells"](#)
- Amin Allalou, PhD 2011, ["Methods for 2D and 3D Quantitative Microscopy of Biological Samples"](#)
- Milan Gavrilovic, PhD 2011, ["Spectral Image Processing with Applications in Biotechnology and Pathology"](#)
- Omer Ishaq, PhD 2016 (nominated for Best Nordic thesis 2015-2016), ["Image Analysis and Deep Learning for Applications in Microscopy"](#)
- Sajith Kecheril Sadanandan, PhD 2017, ["Deep Neural Networks and Image Analysis for Quantitative Microscopy"](#)
- Gabriele Partele, PhD 2020 ["Image and Data Analysis for Spatially Resolved Transcriptomics: Decrypting fine-scale spatial heterogeneity of tissue's molecular architecture"](#)
- Leslie Solorzano, PhD planned 2021
- Håkan Wieslander, PhD planned 2022
- Nicolas Pielawski, PhD planned 2022
- Ankit Gupta, PhD Planned 2023
- Axel Andersson, PhD planned 2023

- Erik Holmström, PhD planned 2024
- Eduard Chelebian, PhD planned 2024
- Andrea Behanova, Ph planned 2024

Co-supervisor for

- Patrick Karlsson, PhD 2008 "[Methods and models for 2D and 3D image analysis in microscopy, in particular for the study of muscle cells](#)", main supervisor: Ewert Bengtsson
- Magnus Gedda, PhD 2010 "[Contributions to 3D Image Analysis using Discrete Methods and Fuzzy Techniques: With Focus on Images from Cryo-Electron Tomography](#)", main supervisor: Ewert Bengtsson
- Ali Korshidi (Dept. of Nano-biotechnology, KTH) PhD 2013 "[Live Single Cell Imaging and Analysis Using Microfluidic Devices](#)", main supervisor Helene Andersson-Svahn
- Andreas Kårsnäs, PhD 2014 "[Image Analysis Methods and Tools for Digital Histopathology Applications Relevant to Breast Cancer Diagnosis](#)", main supervisor: Robin Stand
- Amit Suveer, PhD 2019 "[Methods for Processing and Analysis of Biomedical TEM Images](#)", main supervisor: Ida-Maria Sintorn
- Xiaoyan Qian (Dept. of Biochemistry and Biophysics, SU) PhD 2019 "[Towards comprehensive cellular atlases: High-throughput cell mapping by in situ sequencing](#)", main supervisor Mats Nilsson
- Damian Matuszewski, PhD 2019, "[Image and Data Analysis for Biomedical Quantitative Microscopy](#)", main supervisor: Ida-Maria Sintorn
- Gabriella Edfeldt (Dept of Medicine, Karolinska Institutet) PhD 2020 "[Epithelial barrier protection : implications for HIV susceptibility](#)", main supervisor Annelie Tjernlund
- Michele Simonetti (Dept of Medical Biochemistry and Biophysics at Karolinska Institutet), PhD planned 2021, main supervisor Nicola Crosetto
- Philip Harrison (Dept of Pharmaceutical Biosciences, UU, PhD planned 2022, main supervisor Ola Spjuth)
- Ebba Bergman (Dept of Pharmaceutical Biosciences, UU), PhD planned 2024, main supervisor Ola Spjuth

Main supervisor for postdoctoral fellows

- Martin Simonsson, 2011-2013
- Alexandra Pacureanu, 2012-2014
- Marco Mignardi, 2015-2017
- Maxime Bombrun 2016-2018
- André Liebscher 2016
- Anindya Gupta 2018-2020

TEACHING ACTIVITIES AND MERITS

Lecturer and administrator of graduate and PhD-level courses and workshops in digital image analysis, application oriented image analysis, and quantitative microscopy, in Sweden and abroad on a regular basis. A large part of the teaching includes invited lectures and workshops in courses organized by others, as part of our outreach activities within SciLifeLab and the BioImage Informatics facility (<https://www.scilifelab.se/facilities/bioimage-informatics/>), and organizing training sessions for early career bioimage analysis via the EU COST project NEUBIAS (<http://eubias.org/NEUBIAS>) and the [SOFOSKO](#) summer school.

PUBLICATIONS (selected, a full linked list can be found at http://user.it.uu.se/~cli05194/carolina_publications.html)

- *N. Pielawski, E. Wetzer, J. Öfverstedt, J. Lu, C. Wählby, J. Lindblad, and N. Sladoje. CoMIR: Contrastive Multimodal Image Representation for Registration. In proceedings of [Neural Information Processing Systems 2020 \(NeurIPS 2020\)](#), Nov. 2020.*

- *G. Partel, M.M. Hilscher, G. Milli, L. Solorzano, A.H. Klemm, M. Nilsson, and C. Wählby.* **Automated identification of the mouse brain's spatial compartments from in situ sequencing data.** [BMC Biology](#), doi.org/10.1186/s12915-020-00874-5, Oct 2020.
- *G. Partel and C. Wählby.* **Spage2vec: Unsupervised representation of localized spatial gene expression signatures.** [FEBS Journal](#), doi: 10.1111/febs.15572, Sept 2020.
- *G. Edfeldt, J. Lajoie, M. Röhl, J. Oyugi, A. Åhlberg, B. Khalilzadeh-Binicy, F. Bradley, M. Mack, J. Kimani, K. Omollo, C. Wählby, K. R. Fowke, K. Broliden, A. Tjernlund.* **Regular use of depot medroxyprogesterone acetate causes thinning of the superficial lining and apical distribution of HIV target cells in the human ectocervix.** [The Journal of Infectious Diseases](#), doi: 10.1093/infdis/jiaa514 Aug 2020.
- *G. Partel and C. Wählby.* **Graph-based image decoding for multiplexed in situ RNA detection.** To appear in the proceedings of the International Conference on Pattern Recognition (ICPR), 2020. A pre-publication with similar content can be found here; Permanent [arXiv identifier: 1802.08894](#).
- *L. Solorzano, C. Pereira, D. Martins, R. Almeida, F. Carneiro, G. Almeida, C. Oliveira and C. Wählby.* **Towards automatic protein co-expression quantification in immunohistochemical TMA slides.** [IEEE Journal of Biomedical and Health Informatics](#), doi:10.1109/JBHI.2020.3008821, July 2020.
- *H. Wieslander, P. J Harrison, G. Skogberg, S. Jackson, M. Friden, J. Karlsson, O. Spjuth, and C. Wählby.* **Deep learning and conformal prediction for hierarchical analysis of large-scale whole-slide tissue images.** [IEEE Journal of Biomedical and Health Informatics](#), doi:10.1109/JBHI.2020.2996300, June 2020.
- *L. Solorzano, G. Partel, and C. Wählby.* **TissUMaps: Interactive visualization of large-scale spatial gene expression and tissue morphology data.** [Bioinformatics](#), doi:10.1093/bioinformatics/btaa541, May 2020.
- *N. Pielawski and C. Wählby.* **Introducing Hann windows for reducing edge-effects in patch-based image segmentation.** [PLoS One](#) 15(3):e0229839. Mar 12, 2020, doi:10.1371/journal.pone.0229839.
- *N. Pielawski, J. Hu, S. Strömblad, and C. Wählby.* **In silico prediction of cell traction forces.** Proc [IEEE Int Symp Biomed Imaging 2020](#), April 2020, doi:10.1109/ISBI45749.2020.9098359
- *A. Gupta, V. Larsson, D. Matuszewski, S. Strömblad, and C. Wählby.* **Weakly-supervised prediction of cell migration modes in confocal microscopy images using bayesian deep learning.** Proc [IEEE Int Symp Biomed Imaging 2020](#), April 2020, doi:10.1109/ISBI45749.2020.9098548
- *A. Andersson, G. Partel, L. Solorzano, and C. Wählby.* **Transcriptome-supervised classification of tissue morphology using deep learning.** Proc [IEEE Int Symp Biomed Imaging 2020](#), April 2020, doi:10.1109/ISBI45749.2020.9098361
- *P. Ström, K. Kartasalo, H. Olsson, L. Solorzano, B. Delahunt, D.M. Berney, D.G. Bostwick, A.J. Evans, D.J. Grignon, P.A. Humphrey, K.A. Iczkowski, J.G. Kench, G. Kristiansen, T.H. van der Kwast, K.R.M. Leite, J.K. McKenney, J. Oxley, C-C. Pan, H. Samaratunga, J.R. Srigley, H. Takahashi, T. Tsuzuki, M. Varma, M. Zhou, J. Lindberg, C. Bergström, P. Ruusuvoori, C. Wählby, H. Grönberg, M. Rantalainen, L. Egevad and M. Eklund.* **Artificial intelligence for diagnosis and grading of prostate cancer in biopsies: a population-based, diagnostic study,** [Lancet Oncology](#) doi: [https://doi.org/10.1016/S1470-2045\(19\)30738-7](https://doi.org/10.1016/S1470-2045(19)30738-7) Jan 8 2020.
- *Gupta, P.J. Harrison, H. Wieslander, N. Pielawski, K. Kartasalo, G. Partel, L. Solorzano, A. Suveer, A. H. Klemm, O. Spjuth, I-M. Sintorn, and C. Wählby.* **Deep Learning in Image Cytometry: A Review.** [Cytometry A](#). doi: 10.1002/cyto.a.23701, Dec 19 2018.
- *K. Holzwarth, R. Köhler, L. Philipsen, K. Tokoyoda, V. Ladyhina, C. Wählby, R.A. Niesner, and A.E. Hauser.* **Multiplexed fluorescence microscopy reveals heterogeneity among stromal cells in mouse bone marrow sections.** [Cytometry A](#) 2018 Jul;93(9):876-888. doi: 10.1002/cyto.a.23526, Aug 14 2018.
- *D.J. Matuszewski, C. Wählby, C. Krona, S. Nelander, and I-M. Sintorn.* **Image-based detection of patient-specific drug-induced cell-cycle effects in glioblastoma.** [SLAS Discovery](#) 2018 Dec;23(10):1030-1039. doi: 10.1177/2472555218791414, Aug 3 2018.
- *N. Schizas, S. Perry, B. Andersson, C. Wählby, K. Kullander, and N.P. Hailer.* **Differential Neuroprotective Effects of Interleukin-1 Receptor Antagonist on Spinal Cord Neurons after Excitotoxic Injury.** [Neuroimmunomodulation](#). doi: 10.1159/000484607, Jan 2018.
- *A. Gibbs, M. Buggert, G. Edfeldt, P. Ranefall, A. Introini, S. Cheuk, E. Martini, L. Eidsmo, T.B. Ball, J. Kimani, R. Kaul, A. Karlsson, C. Wählby, K. Broliden, and A. Tjernlund.* **HIV-infected women have high numbers of CD103-CD8+ T cells residing close to the basal membrane of the ectocervical epithelium.** [Journal of Infectious Diseases](#) doi: 10.1093/infdis/jix661, Dec 2017.

- *D.J. Matuszewski, A. Hast, C. Wählby, and I.-M. Sintorn* **A short feature vector for image matching: The Log-Polar Magnitude feature descriptor.** [PLoS One](#). 12(11) doi: 10.1371/journal.pone.0188496, Nov 2017.
- *J. Carreras-Puigvert, M. Zitnik, A.-S. Jemth, M. Carter, J.E. Unterlass, B. Hallström, O. Loseva, Z. Karem, J.M. Calderon-Montano, C. Lindskog, P.-H. Edqvist, D.J. Matuszewski, H. Ait Blal, R.P.A. Berntsson, M. Häggblad, U. Martens, M. Studham, B. Lundgren, C. Wählby, E.L.L. Sonnhammer, E. Lundberg, P. Stenmark, B. Zupan, and T. Helleday.* **A comprehensive structural, biochemical and biological profiling of the human NUDIX hydrolase family.** [Nature Communications](#) 8:1541 doi:10.1038/s41467-017-01642-w, Nov 2017.
- *H. Zhang, M. Ericsson, M. Virtanen, S. Weström, C. Wählby, A. Vahlquist and H. Törmä.* **Quantitative image analysis of protein expression and colocalization in skin sections** [Experimental Dermatology](#) doi: 10.1111/exd.13457, Nov 2017.
- *M. Bombrun, H. Gao, P. Ranefall, N. Mejhert, P. Arner and C. Wählby.* **Quantitative high-content/high-throughput microscopy analysis of lipid droplets in subject-specific adipogenesis models** [Cytometry A](#) doi: 10.1002/cyto.a.23265, Oct 2017.
- *H. Wieslander, G. Forslid, E. Bengtsson, C. Wählby, J.-M. Hirsch, C. Runow Stark and S.K. Sadanandan.* **Deep Convolutional Neural Networks For Detecting Cellular Changes Due To Malignancy** [Proceedings of the IEEE International Conference on Computer Vision \(ICCV\), Bioimage Computing Workshop, pp. 82-89, 2017, Venice, Oct 2017.](#)
- *S.K. Sadanandan, P. Ranefall, S. Le Guyader and C. Wählby.* **Automated Training of Deep Convolutional Neural Networks for Cell Segmentation.** [Nature Scientific Reports](#) 7:7860 doi:10.1038/s41598-017-07599-6, August 2017.
- *N. Talebizadeh, N. Zhou Hagström, Z. Yu, M. Kronschläger, P. Söderberg, and C. Wählby* **Objective automated quantification of fluorescence signal in histological sections of rat lens.** To appear in *Cytometry* doi: 10.1002/cyto.a.23131, May 2017.
- *M. Bombrun, P. Ranefall, J. Lindblad, A. Allalou, G. Partel, L. Solorzano, X. Qian, M. Nilsson, and C. Wählby* **Decoding gene expression in 2D and 3D.** Published at SCIA 2017, Lecture Notes in Computer Science LNCS June 2017.
- *S.K. Sadanandan, P. Ranefall, and C. Wählby.* **Feature Augmented Deep Neural Networks for Segmentation of Cells.** [Lecture Notes in Computer Science](#) Computer Vision - ECCV 2016 Workshops, Volume 9913, pp 231-243, Sept 2016.
- *O. Ishaq, S.K. Sadanandan, and C. Wählby.* **Deep Fish: Deep Learning-Based Classification of Zebrafish Deformation for High-Throughput Screening.** [Journal of Biomolecular Screening](#) pii: 1087057116667894 (2016) doi:10.1177/1087057116667894, Sept 2016.
- *C. Wählby.* **The quest for multiplexed spatially resolved transcriptional profiling.** [Nature Methods](#) 13, 623-624 (2016) doi:10.1038/nmeth.3924, July 2016.
- *M. Mignardi, O. Ishaq, X. Qian, and C. Wählby.* **Bridging Histology and Bioinformatics - Computational Analysis of Spatially Resolved Transcriptomics.** [Proceedings of the IEEE](#) 99, doi: 10.1109/JPROC.2016.2538562, April 2016.
- *D. J. Matuszewski, C. Wählby, J. C. Puigvert, and I.-M. Sintorn.* **PopulationProfiler: A Tool for Population Analysis and Visualization of Image-Based Cell Screening Data.** [PLoS ONE](#) 17;11(3):e0151554. doi: 10.1371/journal.pone.0151554, March 2016.
- *P. Ranefall and C. Wählby.* **Global gray-level thresholding based on object size.** [Cytometry A](#), online version DOI: 10.1002/cyto.a.22806, Jan 2016.
- *C. Wählby.* **Image Segmentation, Processing and Analysis in Microscopy and Life Science.** Book chapter, pages 1-16, in [Mathematical Models in Biology: Bringing Mathematics to Life](#), Springer December 2015, Editors: V. Zazzu, M.B. Ferraro and M.R. Guarracino, ISBN 978-3-319-23496-0.
- *S.K. Sadanandan, Ö. Baltekin, K.E.G. Magnusson, A. Boucharin, P. Ranefall, J. Jaldén, J. Elf, and C. Wählby.* **Segmentation and track-analysis in time-lapse imaging of bacteria.** [IEEE Journal of Selected Topics in Signal Processing](#), October 15, 2015, 10(1):174-184
- *C.-M. Clausson, L. Arngården, O. Ishaq, A. Klaesson, M. Kühnemund, K. Grannas, B. Koos, X. Qian, P. Ranefall, T. Krzywkowski, H. Brismar, M. Nilsson, C. Wählby and O. Söderberg.* **Compaction of rolling circle amplification products increases signal integrity and signal-to-noise ratio.** [Nature Scientific Reports](#) 5, 12317, June 2015.

- B. Koos, M. Kamali-Moghaddam, L. David, M. Sobrinho-Simões, A. Dimberg, M. Nilsson, C. Wählby, and O. Söderberg. **Next generation Pathology - surveillance of tumor microecology.** [J Mol Biol.](#), 2015 June 5, 427(11):2013-22.
- C. Wählby, A.L. Conery, M.A. Bray, L. Kamentsky, J Larkins-Ford, KL Sokolnicki, M Veneskey, K Michaels, A.E. Carpenter, and E.J. O'Rourke. **High- and low-throughput scoring of fat mass and body fat distribution in *C. elegans*.** [Methods](#), 2014 Aug 1;68(3):492-9.
- M.A. Khorshidi, P.K. Periyannan Rajeswari, C. Wählby, H.N. Joensson, and H. Andersson Svahn. **Automated analysis of dynamic behavior of single cells in picoliter droplets.** [Lab on a Chip](#), 2014 (14), 931-937.
- R. Ke, M. Mignardi, A. Pacureanu, J. Svedlund, J. Botling, C. Wählby, and M. Nilsson. **In situ sequencing for RNA analysis in preserved tissue and cells.** [Nature Methods](#), 2013 (10), 857-860.
- N.V. Kirienko, D.R. Kirienko, J. Larkins-Ford, C. Wählby, G. Ruvkun, and F.M. Ausubel. **Pseudomonas aeruginosa disrupts Caenorhabditis elegans iron homeostasis, causing a hypoxic response and death.** [Cell Host and Microbe](#), 2013 Apr 17;13(4):406-16.
- C. Pardo-Martin, A. Allalou, J. Medina, P.M. Eimon, C. Wählby, and M.F. Yanik. **High-throughput hyperdimensional vertebrate phenotyping.** [Nature Communications](#), 2013 Feb 12; 4:1467.
- M. Gavrilovic, J.C. Azar, J. Lindblad, C. Wählby, E. Bengtsson, C. Busch, and I.B. Carlbom. **Blind color decomposition of histological images.** [IEEE Transactions on Medical Imaging](#), 2013 Jun; 32(6):983-94.
- A.K. Raap, R.S. Jahangir Tafrechi, F.M. van de Rijke, A. Pyle, C. Wählby, et al. **Non-random mtDNA segregation patterns indicate a metastable heteroplasmic segregation unit in m.3243A>G cybrid cells.** [PLoS One](#), 2012, 7(12):e52080.
- C. Wählby, L. Kamentsky L, Z.H. Liu, T. Riklin-Raviv, A.L. Conery, E.J. O'Rourke, K.L. Sokolnicki, O. Visvikis, V. Ljosa, J.E. Irazoqui, P. Golland, G. Ruvkun G, F.M. Ausubel, and A. E. Carpenter. **An image analysis toolbox for high-throughput *C. elegans* assays.** [Nature Methods](#), 2012 Apr 22; 9(7): 714-716.
- T.Y. Chang, C. Pardo-Martin, A. Allalou, C. Wählby and M.F. Yanik. **Fully automated cellular-resolution vertebrate screening platform with parallel animal processing.** [Lab on a Chip](#), 2012 Feb 21;12(4):711-6
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- Weibrecht, M. Gavrilovic, L. Lindbom, U. Landegren, C. Wählby and O. Söderberg. **Visualising individual sequence-specific protein-DNA interactions *in situ*.** [New Biotechnology](#), 2012 Jun 15;29(5):589-98.
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PATENT APPLICATION

- Pending European patent application (filed 20190118 by collaborator Q-Linea AB) on Analysis of images of biological material (17731862.3 – 1210).

POPULAR SCIENCE ACTIVITIES (selected)

- Chairman of organizing committee, full day popular science activity for celebrating the 100th birthday of the Royal Academy of Engineering Sciences (IVA) 'Upplev, upptäck, utforska – som en ingenjör' activity for 700 children in 7th grade at the Museum of Science, Stockholm, 20190917
- Participating as 'specialist' in 'The Lab', a 'lock in experiment' with five students discussing societal challenges and future developments; focus on AI in medicine, see [youtube](#) at 1:59:00.
- C. Wählby, speaker, "Kan AI ersätta en läkare?", Uppsala Science Slam, popular science activity for 9th graders, Uppsala 20190322
- C. Wählby, speaker, "Den digitala framtiden-AI i mänsklighetens tjänst", UPPTECH popular science breakfast for Uppsala University alumni, Stockholm 20190511
- C. Wählby "AI som verktyg för hälsa -Var står vi idag?" [ForskaSverige!](#) -dagen on on AI for health, November 28, 2018
- C. Wählby "[The British Science Festival](#)" – presentation and panel discussion on artificial intelligence in the clinic, [The robot will see you now](#). September 13, 2018.
- Main organizer of the 'Research school at Nobel's Karlskoga' (<http://www.fsik.se>) for college-level students on a yearly basis 1998-2001
- Lecturing at the Ångström teachers days for high school teachers 2009
- Organizing activities for children at TomTits experiments and Uppsala SciFest.
- Initiated the CYTO2017 Image Analysis Challenge, in collaboration with the Human Protein Atlas www.proteinatlas.org.

INVITED SCIENTIFIC TALKS (selected)

- C. Wählby, keynote, "Artificial intelligence in biomedical imaging" [SophIA Summit: 3rd Edition of an International Symposium on Artificial Intelligence and its applications](#). Nice, France, Nov. 18-20, 2020 (digital)
- C. Wählby, invited speaker, "Deep Convolutional Neural Networks as a tool in image based Systems Biology" [5th International Symposium on Image-based Systems Biology \(IbSB 2020\)](#), Jena, Germany (digital), October 1-2, 2020
- C. Wählby, invited speaker, "Analysis of time-series and large tissue samples; new possibilities with deep learning and spatially resolved analysis of gene expression" [NEUBIAS Conference](#), Luxemburg, 20190207
- C. Wählby, invited speaker, "Single cell analysis by digital image processing of tissue and time-lapse data." Single cell biology meets diagnostics, 12th International workshop on approaches to single cell analysis, Uppsala, 20190304

- C. Wählby, invited speaker, “*AI in digital pathology and biomedicine - potential and limitations*”, Engineering Health, Göteborg, 20190320
- C. Wählby, invited speaker, “‘*Seeing is believing, measuring is knowing*’ - quantitative analysis in digital pathology”, The Swedish Tumor Microenvironment Meeting 2019, Umeå 20190411
- C. Wählby, invited speaker, “*In situ sequencing & tissue morphology; should we do segmentation?*” [Sanger Institute](#) workshop on Machine Learning, Cambridge, 20190501
- C. Wählby, member of organizing committee and introductory speaker “*Multiplexed Screening with Single Cell Resolution*”, [ELRIG 2019](#) – Advances in Cell Based Screening in Drug Discovery, AztraZeneca, Mölndal, 20190522-24
- C. Wählby, invited speaker “*In situ sequencing & tissue morphology; from images to compartments and cells*”, FIMM High Content Screening Symposium, Helsingfors, 20191021
- C. Wählby, member of organizing committee and introductory speaker “*Bioimage Analysis*“, [Women in Computational Biology](#), HHMI Janelia, Washington DC, 20191110-14
- C. Wählby, keynote, “*AI-tillämpningar inom universitetssjukvård och akademi*”, InFutrum, Göteborg, 20191118
- C. Wählby Panel discussion at [AIMed Europe](#), September 11-13, 2018, discussing “*How artificial intelligence can be implemented in the European Healthcare system*”, see [youtube clip](#).
- C. Wählby “*Tissue analytics and machine learning for pathology*” [14th European Congress on Digital Pathology and the 5th Nordic Symposium on Digital Pathology](#), Helsinki, Finland, May 29-June 1, 2018.
- C. Wählby “*Artificial Intelligence as a Tool in Image Cytometry: Potentials and Pitfalls*”, CYTO 2018 ISAC 33rd International Congress Prague, Czech Republic, April 27-May 3, 2018.
- C. Wählby “*Image-based chemical and genetic screening; What can a computer ‘see?’*” SciLifeLab Summit, Stockholm, Sweden, April 25, 2018.
- C. Wählby “*Deep learning for drug screening; hierarchical approaches for sparse image data of cells, model organisms and tissue*”, [BioImage Informatics Conference 2017](#), Banff, Canada, Sept 19-21, 2017
- C. Wählby “*Digital image analysis in microscopy; hierarchical approaches for sparse data of cells, model organisms and tissue*”, [17th Congress of the European Light Microscopy Initiative \(ELMI2017\)](#), in Dubrovnik, Croatia, May 23-26, 2017.
- C. Wählby “*Deep learning in life science and microscopy - challenges and possibilities*”, [The First Swedish Symposium on Deep Learning](#), Stockholm June 20-21, 2017.
- C. Wählby “*Untangling worms; high throughput worm phenotyping*” at the [2017 GENIE High Content Screening Workshop](#), Porto, Portugal, Feb 9-10, 2017.
- C. Wählby “*Digital image processing and analysis as a tool in life science - from drug screening to in situ sequencing*”, Carnegie-Mellon University, Pittsburgh, October 11, 2016.
- C. Wählby “*Combining image-based in situ RNA sequencing with quantitative analysis of cell and tissue morphology*”, in [London 3rd Digital Pathology Congress](#), December 1-2, 2016.
- C. Wählby “*From cultured cells to tissue samples; challenges and possibilities for digital image processing*”, International Workshop on Biomedical Image Informatics for Precision Medicine, EWHA, Seoul, South Korea, April 22, 2016.
- C. Wählby “*Possibilities and pitfalls in large-scale image-based screening*”, SciLifeLab Scientific Seminar: [New Approaches in Cell Based Assays – Getting More Out Of Less?](#) SciLifeLab, Solna, Sweden, May 31, 2016.
- C. Wählby “*Digital image analysis at microscopy resolution for better understanding of disease*” [5th International Symposium in Applied Bioimaging](#), Porto, Portugal, October 26-28, 2016
- C. Wählby “*From pretty picture to quantitative data – using digital image processing and analysis to improve microscopy experiments*”. Invited speaker at the [2nd Symposium on Bridging Nordic Imaging](#) in Gothenburg, Sweden, April 14-15, 2016.
- C. Wählby Invited speaker, “*Fishing out relevant information from large scale experiments*”. [Swiss Image-Based Screening Conference 2015](#), at the Novartis Learning Center Horburg, Basel, Switzerland, September 30-October 1, 2015.
- C. Wählby “*Image based drug discovery - challenges and opportunities at the microscopy scale*”. Invited speaker at the [19th Scandinavian Conference on Image Analysis](#), at the IT University of Copenhagen in Denmark, June 2015.
- C. Wählby “*Characterizing solid tumors by image-based high throughput screening of cancer stem cells*”. Invited speaker at the [2nd High Throughput Cell Biology: from screening to applications](#), at Institut Curie - Research Centre, Paris, France, November 2014.

- C. Wählby “*Image processing and analysis in microscopy and life science*”. Invited speaker on mathematics and biology at the [BMTL meeting](#) in Naples, Italy, October 2014.
- C. Wählby “*Combining image-based in situ RNA screening with quantitative analysis of cell and tissue morphology*”. Invited speaker at the 1st annual conference for the Society of Biomolecular Imaging and Informatics [SBI2](#), in Boston, MA, USA, September 2014.
- C. Wählby “*Quantitative microscopy: extracting relevant information from biomedical image data.*” Invited speaker at the [International Microscopy Congress](#) (IMC) in Prague, Czech Republic, September 2014.
- C. Wählby “*Extracting discoveries hidden in images*”. Invited speaker at the international conference on [Advances in Tissue Regeneration](#) in Lattorp, the Netherlands, November 2013.
- C. Wählby “*High throughput phenotyping of model organisms*”. Invited speaker at [Bioimage Informatics](#), Dresden, Germany, September 16 - 19, 2012.
- C. Wählby “*A toolbox for high-throughput C. elegans phenotyping*” Invited speaker at the [Automated Imaging & High-Throughput Phenotyping](#) conference at Cold Spring Harbour Laboratory, NY, USA, April 10 - 13, 2012.
- C. Wählby “*The WormToolbox: automated image analysis for high-throughput C. elegans assays*” Invited speaker at the [2012 NordForsk C. elegans network meeting](#) in Sigtuna, Sweden, March 2 - 4, 2012.
- C. Wählby. “*Digital Image Analysis of Cells: Informatics & Knowledge Extraction*” Invited plenary speaker of CYTO 2010: XXV Congress of the International Society for Advancement of Cytometry, Seattle, Washington, USA, May 8-12, 2010.