Supervisor Portfolio for the Doctoral Programme in Biosciences and Drug Research

Cell Biology

Guillaume Jacquemet
Silvia Gramolelli

Pharmacy

Outi Salo-Ahen
Tapani Viitala
Kuldeep Bansal

Marine Biology

Riikka Puntila-Dodd
Conny Sjöqvist
Christian Pansch-Hattich
Christoffer Boström

Biochemistry

Peter Mattjus

Guillaume Jacquemet

Group: Cell Migration Lab
Subject: Cell Biology
University: Åbo Akademi University
Lab Website: https://cellmig.org/
CRIS profile: https://research.abo.fi/en/persons/guillaume-jacquemet

Areas of Expertise

- Cancer cell biology
- Cell adhesion and migration
- Microscopy and live imaging
- Image analysis

Research Projects

- The role of filopodia during breast cancer progression
- Cancer cell communication via filopodia trans- endocytosis
- Deciphering the mechanisms of pancreatic cancer metastasis
- The role of mechanosensitive calcium channels in melanoma
- The role of TLNRD1 in endothelium homeostasis
- Democratising deep learning for microscopy with ZeroCostDL4Mic

Special Methodologies & Techniques

- Microscopy (super-resolution microscopy, live imaging, traction force microscopy)
- Image analysis, deep learning and computer vision
- Cell and molecular biology
- Mass spectrometry (identification of protein-protein interactions using pull-downs and biotinylation-based strategy)
- Zebrafish embryo to study cancer biology
- Flow and perfusion chambers

Funding & Networks

- Sigrid Juselius Foundation
- Wellcome Trust
- Academy of Finland
- Finnish Cancer Foundation
- Inflames
- Turku Bioscience

Selected Publications

- TLNRD1 is a CCM complex component and regulates endothelial barrier integrity. J Cell Biol. 2024 Sep 2; 223(9): e202310030. DOI: 10.1083/jcb.202310030
- CellTracksColab is a platform that enables compilation, analysis, and exploration of cell tracking data. PLOS Biol. August 8, 2024. DOI: 10.1371/journal.pbio.3002740
- MYO10-filopodia support basement membranes at preinvasive tumor boundaries. Dev Cell. 2022; 57 (20), 2350- 2364. E7. DOI: 10.1016/j.devcel.2022.09.016
- TrackMate 7: Integrating state-of-the-art segmentation algorithms into tracking pipelines. Nat. Methods. 2022; 19 829832. DOI: 10.1038/s41592-022-01507-1
- Democratising Deep Learning for Microscopy with ZeroCostDL4Mic. Nat Commun. 2021; 4:15;12(1): 2276. DOI: 10.1038/s41467-021-22518-0

Outi Salo-Ahen

Group: Computer-aided drug design (CADD) group
Subject: Pharmacy
University: Åbo Akademi University
Lab Website: https://www.pharmscilab.fi/computer-aided-drug-design
CRIS profile: https://research.abo.fi/sv/persons/outi-salo-ahen

Areas of Expertise

- Computer-aided drug design
- Molecular modeling
- Biomolecular simulations
- Computational chemistry/biology and computational pharmaceutics
- Structural bioinformatics
- Immunoinformatics

Research Projects

- Discovery and design of novel antivirulence agents / antimicrobial compounds / anticancer drugs
- Computational analysis of pharmaceutical materials (e.g., nanoparticles, polymers)

Special Methodologies & Techniques

- Comparative protein modeling
- Molecular docking
- Molecular dynamics simulations
- Molecular interaction analysis
- Materials science modeling

Funding & Networks

- Tor, Joe & Pentti Memorial Fund
- Svenska Kulturfonden
- Research Council of Finland
- EU-OPENSCREEN

Selected Publications

- Microfluidics-Enabled Core/Shell Nanostructure Assembly: Understanding Encapsulation Processes via Particle Characterization and Molecular Dynamics. Adv Colloid Interface Sci 338, 103400, 2025. DOI: 10.1016/j.cis.2025.103400
- Insights Into Molecular Interactions and Biological Effect of Natural Stilbenoids at the TRPA1 ion channel. ChemMedChem, e202400501, 2024. DOI: 10.1002/cmdc.202400501
- Development of Aptamer-DNAzyme based metal-nucleic acid frameworks for gastric cancer therapy. Nat Commun 15(1):3684, 2024. DOI: 10.1038/s41467-024-48149-9.
- Isolation and functional analysis of phage-displayed antibody fragments targeting the staphylococcal superantigen-like proteins. MicrobiologyOpen, 12, e1371, 2023. DOI: doi.org/10.1002/mbo3.1371
- The discovery of Zika virus NS2B-NS3 inhibitors with antiviral activity via an integrated virtual screening approach. Eur J Pharm Sci 2022, 106220. DOI: 10.1016/j.ejps.2022.106220

Riikka Puntila-Dodd

Group: Marine ecosystem ecology
Subject: Marine Biology
University: Åbo Akademi University
CRIS profile: https://research.abo.fi/en/persons/riikka-puntila-dodd

Areas of Expertise

- Ecosystem modelling
- Ecopath with Ecosim
- Species distribution modelling
- Future scenarios
- Baltic Sea
- Cumulative pressures

Research Projects

- GES4SEAS
- MIMOSA
- Identifying changes in coastal ecosystems – implications to
- Recovery trajectories (RCoF)
- SEADITO

Special Methodologies & Techniques

- Ecopath with Ecosim
- Bayesian networks
- Species distribution modelling
- Integrated trend analysis
- Multivariate analyses

Funding & Networks

- RCoF
- Horizon Europe ICES WGIAB
- Marine modelling network
- Ecopath Consortium
- Beyond shifting baselines-consortium

Selected Publications

- Novelty, variability, and resilience:exploring adaptive cycles in a marine ecosystem under pressure. Ambio. DOI: doi.org/10.1007/s13280-025-02181-1
- Food web robustness depends on the network type and threshold for extinction. Oikos. DOI: doi.org/10.1111/oik.11139.
- Modelling Framework to Evaluate Societal Effects of Ecosystem Management STOTEN. DOI: doi.org/10.1016/j.scitotenv.2023.165508
- Integrating diverse model results into decision support for good environmental status and blue growth. STOTEN. DOI: doi.org/10.1016/j.scitotenv.2021.150450.
- Food-web modeling in the Maritime Spatial Planning Challenge Simulation Platform: Results from the Baltic Sea. Proc Int Simulation and Gaming Ass Conf. DOI: doi.org/10.1007/978-3-030-72132-9_25

Peter Mattjus

Group: Lipid Transfer Protein Research
Subject: Biochemistry
University: Åbo Akademi University
Lab Website: https://users.abo.fi/pmattjus/
CRIS profile: https://research.abo.fi/sv/persons/peter-mattjus

Areas of Expertise

- The role of glycolipid transfer proteins in cells
- Glycosphingolipid biosynthesis
- Intracellular glycosphingolipid transport events

Research Projects

- Glycolipid transfer protein, GLTP interaction with VAP-proteins in the ER exit sites
- The role GLTP in demyelination
- Intracellular localization of GLTP
- Inhibitors for glycolipid binding proteins

Special Methodologies & Techniques

- Lipid biochemistry
- Quantitative and qualitative glycosphingo- and phospholipid analysis by high performace TLC
- Cell and molecular biology
- Fluorescence spectroscopy, steady-state and life-time
- Radioisotope labeling and lipid metabolism techniques

Funding & Networks

- Medicinska understödsföreningen Liv och hälsa
- Borgs stiftelse
- COST action SPHINX member

Selected Publications

- Glycolipid transfer protein knockout disrupts vesicle trafficking to the plasma membrane. Journal of Biological Chemistry 2023. DOI: 10.1016/j.jbc.2023.104607
- Who moves the sphinx? An overview of intracellular sphingolipid transport. BBA Molecular and Cell Biology of Lipids. DOI: 10.1016/j.bbalip.2021.159021
- Glucosylceramide acyl chain length is sensed by the glycolipid transfer protein. PLoS ONE. DOI: 10.1371/journal.pone.0209230
- Alternation in the Glycolipid Transfer Protein Expression Causes Changes in the Cellular Lipidome. PLoS ONE. DOI: 10.1371/journal.pone.0097263
- Vesicular and non-vesicular transport feed distinct glycosylation pathways in the Golgi. Nature. DOI: 10.1038/nature12423

Conny Sjöqvist

Group: Molecular Ecology Lab
Subject: Marine Biology
University: Åbo Akademi University
Lab Website: www.connysjoqvist.com
CRIS profile: https://research.abo.fi/en/persons/conny-sj%C3%B6qvist

Areas of Expertise

- Plankton ecology and evolution
- Experimental and molecular ecology
- Paleo- and resurrection biology

Research Projects

- Temperature adaptation in European diatom populations - AWARE
- Hotspots for biodiversity shifts in the Archipelago Sea - BIOSHIFT
- Modeling advanced primary production scenarios in coastal seas - MIMOSA
- Geochemical Dynamics of Seawater-Submarine Aquifer Interactions: Impacts on Coastal Sediments and Ecosystems
- Switching functional roles gene expression of feeding trait plasticity in a marine key species - GeneMac

Special Methodologies & Techniques

- Cell cultivation
- Microscopical analyses
- DNA and RNA sequencing
- Population genomics
- Transcriptomics
- Bioinformatics

Funding & Networks

- Centre for Sustainable Ocean Science
- Swedish Cultural Foundation
- European Molecular Biology Laboratory (EMBL)
- Traversing European Coastlines (TREC)
- Estonian Research Council

Selected Publications

- Biodiversity of microorganisms in the Baltic Sea: The power of novel methods in the identification of marine microbes. FEMS Microbiology Reviews (2024). 48, 5, fuae024. DOI: 10.1093/femsre/fuae024
- Temperature optima of a natural diatom population increases as global warming proceeds. Nature Climate Change (2024). 14, 5, p. 518-525. DOI: 10.1038/s41558-024-01981-9
- Toward phytoplankton parasite detection using autoencoders. Machine Vision and Applications (2023). 34, 6, p. 101 6. DOI: 10.1007/s00138-023-01450-x
- Strain-specific transcriptional responses overshadow salinity effects in a marine diatom sampled along the Baltic Sea salinity cline. ISME Journal (2022). 16, 7, p. 1776-1787. DOI: 10.1038/s41396-022-01230-x
- Ecologically coherent population structure of uncultivated bacterioplankton. ISME Journal (2021). 15, pages 3034–3049. DOI: 10.1038/s41396-021-00985-z

Silvia Gramolelli

Group: Viral Oncogenesis
Subject: Cell Biology
University: Åbo Akademi University
Lab Website: https://viraloncor.wordpress.com/
CRIS profile: https://research.abo.fi/sv/persons/silvia-gramolelli/publications/

Areas of Expertise

- Gene expression
- Chromatin remodelling
- Viral reactivation from latency
- Cellular transformation

Research Projects

- Role of somatic mutations in Epstein-Barr virus-induced oncogenesis and drug resistance
- Role of stress-related transcription factors in oncogenic herpesvirus persistence and gene expression
- New diagnostic tools based on DNA nanotechnology to detect viral genomic sequences

Special Methodologies & Techniques

- Patient-derived organoids
- Lentiviral production and transduction
- Chromatin IP
- Proteomics

Funding & Networks

- Research Council of Finland
- Sigrid Juselius
- Finnish Cultural Foundation
- Mary & George Ehrnrooth Foundation
- Suomen Tiedeseura
- InFLAMES

Selected Publications

- Heat shock factor 2 regulates oncogenic gamma-herpesvirus gene expression by remodeling the chromatin at the ORF50 and BZLF1 promoter. PLoS Pathog. 2025
- DLL4/Notch3/WNT5B axis mediates bidirectional prometastatic crosstalk between melanoma and lymphatic endothelial cells. JCI Insight. 2024
- Oncogenic Herpesvirus Engages Endothelial Transcription Factors SOX18 and PROX1 to Increase Viral Genome Copies and Virus Production. Cancer Res. 2020
- Kaposis Sarcoma-Associated Herpesvirus Lytic Replication Is Independent of Anaphase-Promoting Complex Activity. Journal of Virology 2020
- High tissue MMP14 expression predicts worse survival in gastric cancer, particularly with a low PROX1. Cancer Medicine 2019

Christian Pansch-Hattich

Group: Experimental Ecology - Stress Ecology & Ecophysiology
Subject: Marine Biology
University: Åbo Akademi University
Lab Website: https://pansch-research.com
CRIS profile: https://research.abo.fi/en/persons/christian-pansch-hattich

Areas of Expertise

- Climate change impacts on marine systems; environmental variability & extreme climatic events, heatwaves, climate change refugia, thermal microclimates
- Area; Ecophysiology, thermal ecology, acclimation & adaptation, species interactions e.g. facilitation, mesocosm food webs, invasion ecology, macrophyte-grazer interactions
- Systems; Bivalves, macrophytes (seagrass, Fucus), associated epi- and infauna, crustaceans (Gammarus, Idotea, mudcrabs), phytoplankton

Research Projects

- PhD S. Rühmkorff; Resilience of Seagrass Ecosystems through Habitat Heterogeneity & Genetic Diversity
- ÅA Stiftelse; SOS - Centre for Sustainable Ocean Science
- Horizon; SEA-Quester - Blue Carbon production, export, & sequestration in emerging polar ecosystems
- Res. Counc. Norway; NORSE - Biodiversity in Northern European Seagrass meadows – drivers, responses, & resilience
- PhD L. Kraufvelin; Impacts of Heatwaves on the Functioning of Temperate Coastal Ecosystems

Special Methodologies & Techniques

- Combine ecophysiology, acclimation and adaptation experimental studies with simplified community assessments in mostly experimental approaches
- Using high-throughput incubation units and mesocosms
- Simulating multiple and fluctuating climate change drivers
- High-resolution coastal environmental monitoring

Funding & Networks

- Funders; EU, Research Council Fi, Svenska Kulturfonden, Stiftelse Åbo Akademi, City of Turku
- Collaborations; Tvärminne Zoological Station at Helsinki University, Turku, University of Applied Sciences – TUAS, Tjärnö Marine Laboratory at Gothenburg University, GEOMAR – Helmholtz Centre for Ocean Research Kiel, Alfred Wegener Institute for polar and marine research (AWI) – Wadden Sea Station Sylt, Leibniz Institute for Baltic Sea Research Warnemünde – IOW

Selected Publications

- Small-scale thermal habitat variability may not determine seagrass resilience to climate change. Limnology and Oceanography
- The interplay of co-occurring ecosystem engineers shapes the structure of benthic communities – a mesocosm experiment. Frontiers in Marine Science 11:1304442
- Marine heatwaves and hypoxic upwelling shape stress responses in a keystone predator. Proceedings of the Royal Society Biological Sciences 290:20222262
- Environmental variability in aquatic ecosystems: avenues for future multifactorial experiments. Limnology and Oceanography – Letters 8:247-266
- Editorial: Influence of environmental variability on climate change impacts in marine ecosystems. Frontiers in Marine Science 9:994756

Christoffer Boström

Subject: Marine Biology
University: Åbo Akademi University
CRIS profile: https://research.abo.fi/sv/persons/christoffer-bostr%C3%B6m/projects/

Areas of Expertise

- Marine ecology

Research Projects

- Digital Waters

Special Methodologies & Techniques

- Marine field sampling, mesocosm experiments, field experiments

Funding & Networks

- Doctoral Pilot
- Svenska Kulturfonden
- networks Zostera Experimental Network
- Nordic collaboration

Selected Publications

- Marine biodiversity loss in coastal waters: evidence and implications for management in Finnish sea areas, northern Baltic Sea, AMBIO 2025. in press.
- Shallow coastal bays as sediment carbon and nutrient reservoirs in the Baltic Sea. Estuaries and Coasts 2024 in press
- Assessing the success of marine ecosystem restoration using meta-analysis. 2025. Nature Communications.
- The methylome of clonal seagrass shoots shows age-associated variation and differentiation of roots from other tissues. Biochimica et Biophysica Acta. 2025. Vol. 1869, Issue 2. DOI: 10.1016/j.bbagen.2024.130748.
- Global effects of ecosystem and climate on long-term belowground decomposition in wetlands. Environmental Science & Technology DOI: 10.1021/acs.est.4c02116

Tapani Viitala

Group: Pharmaceutical Biophysics
Subject: Pharmacy
University: Åbo Akademi University
CRIS profile: https://research.abo.fi/fi/persons/tapani-viitala

Areas of Expertise

- pharmaceutical nanotechnology
- surface and colloid chemistry
- physico-chemical characterization
- drug delivery and targeting
- biomolecular interactions
- real-time label-free living cell sensing
- 3D printing

Research Projects

- NAP4DIVE; Non-Animal Platform for Nanoparticle-Based Delivery Across the Blood-Brain Barrier Interface with Vehicle Evolution - EU Horizon RIA
- Nordic Pharmaceutical Translation and Innovation - Nordforsk
- MADNESS; Centre of Excellence in Materials-driven solutions for combatting antimicrobial resistance - Åbo Akademi Foundation
- Data integrated platforms for the design, production, and testing of therapeutics (project in Helsinki) - Business Finland

Special Methodologies & Techniques

- Multi-Parametric Surface plasmon resonance
- Impedance-based Quartz Crystal Micorbalance
- LigandTracer
- Waveguide scattering microscopy

Funding & Networks

- EU Horizon RIA
- NordForsk
- Åbo Akademi Foundation
- Business Finland

Selected Publications

- M. Bahman, N. Sandler Topelius, Tapani Viitala*. European Journal of Pharmaceutical Sciences (2025) 107122. DOI: 10.1016/j.ejps.2025.107122
- R.A. Mustafa, P. Parkkila, J.M. Rosenholm, H. Zhang, Tapani Viitala*. Smart Medicine 2 (2023) e20230012. DOI: 10.1002/SMMD.20230012
- E. Scurti, J. Pedro Martins, C. Celia, P. Palumbo, F. Lombardi, D. Iannotta, L. Di Marzio*, H. A. Santos*, T. Viitala*. Langmuir 39 (2023) 8255–8266. DOI: 10.1021/acs.langmuir.3c00728
- P. Parkkila*, K. Härkönen, P. Ilvonen, S. Laitinen, T. Viitala*. Colloids and Surfaces A: Physicochemical and Engineering Aspects 654 (2022), 130015. DOI: 10.1016/j.colsurfa.2022.130015
- O.K. Kari*, J. Ndika, P. Parkkila, A. Louna, T. Lajunen, A. Puustinen, T. Viitala*, H. Alenius and A. Urtti. Nanoscale 12 (2020) 1728-1741. DOI: 10.1039/C9NR08186K

Kuldeep Bansal

Group: Pharmaceutical Sciences Laboratory
Subject: Pharmacy
University: Åbo Akademi University
Lab Website: https://www.pharmscilab.fi/
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Areas of Expertise

- Functional Polymers
- Stimuli-Sensitive Polymers
- Targeted and Controlled Drug Delivery
- Polymeric Micelles
- Polymer-Drug Conjugates
- Microparticles
- Amorphous Solid Dispersions
- Polymeric Nanoemulsion

Research Projects

- Centre of Excellence in Materials-driven Solutions for Combatting Antimicrobial Resistance (MADNESS)
- Jasmine PRO; A versatile platform for drug delivery
- Non-Animal Platform for Nanoparticle-Based Delivery across the blood-brain barrier Interface with Vehicle Evolution

Special Methodologies & Techniques

- Polymer Synthesis and Characterization (NMR, FTIR, GPC, DSC),
- Nanoparticle Synthesis and Characterization (nanoprecipitation, microfluidics, DLS, HPLC, TEM),
- Cell Culture,
- Design of Stimuli-Sensitive Drug Delivery Platforms

Funding & Networks

- Funding Sources:
- Stiftelsen för Åbo Akademi
- Business Finland
- Academy of Finland
- International Networks:
- Copenhagen University
- NIPER, India
- UiT The Arctic University of Norway
- University College London

Selected Publications

- Reactive Oxygen Species-Regulated Conjugates Based on Poly (jasmine) Lactone for Simultaneous Delivery of Doxorubicin and Docetaxel, Pharmaceutics, 16(9), 1164, 2024.
- Poly-δ-decalactone (PDL) based nanoemulgel for topical delivery of ketoconazole and eugenol against Candida albicans, Nanoscale Advances, 6, 5322-5336, 2024.
- Utilizing the allyl-terminated copolymer methoxy (poly(ethylene glycol))-block-poly (jasmine lactone) in the development of amorphous solid dispersions: A comparative study of functionalized and nonfunctionalized polymer, International Journal of Pharmaceutics, 657, 124175, 2024.

- Functional block copolymer micelles based on poly (jasmine lactone) for improving the loading efficiency of weakly basic drugs, RSC advances, 12(41), 26763-26775, 2022.
- Synthesis and evaluation of novel functional polymers derived from renewable jasmine lactone for stimuli-responsive drug delivery, Advanced Functional Materials, 31(33), 2101998, 2021.