Scientific Interests of Node Partners:

Bartha-Doering Group
Universitätsklink für Kinder- und Jugendheilkunde
- Development of language localization during childhood
- Language localization and reorganization in neuropediatric diseases
- Development of sleep-wake cycles in infants
- Predictors of neurodevelopmental outcome

Baumann Lab
Center for Medical Physics and Biomedical Engineering
- Development of optical methods for non-invasive small animal imaging
- Multifunctional OCT imaging for high speed and high resolution imaging
- Longitudinal studies in small animal models
- Correlation to histomorphological analysis with Core Facility Imaging (M. Gröger)

Berger Lab
Institute for Cancer Research
- Short- and long-term Life-cell imaging of tissue culture cells.
- Investigation of drug induced cell behavior & dynamic cellular events with different spatial and temporal resolution.

Blumer Lab
Centre for Anatomy & Cell Biology
- Analyses of the proprioceptive organs in mammalian including human extraocular muscles

Breuss Lab
Institut für Gefäßbiologie und Thromboseforschung
- Development of parallel, long term cell culture time lapse recording
- Endothelial senescence (propagation and stress induced)and NFkB
- Tumor angiogenesis in mouse models
- Restenosis studies (murine femoral artery cuff model) and inflammation

Drexler Lab
Center for Medical Physics and Biomedical Engineering
- Development of ultrafast and super continuum laser technologies
- Multispectral, ultrahigh resolution, high speed OCT
- Adaptive optics OCT (cellular resolution retinal OCT) with PircherLab
- Development of multimodal optical imaging (hybrid OCT/photoacoustic tomography/microscopy; hybrid OCT/nonlinear optical microscopy (CARS, SHG, THG, FWM); hybrid OCT/multiphoton microscopy / tomography; hybrid OCT/Raman spectroscopy)
- Integrated diagnostics / optics (miniaturization of OCT; OCT on a chip)

Doth Lab
Center for Brain Research
- Lichtblattmikroskopie großer, durchsichtiger Präparate

Dolak Group
Universitätsklinik für Innere Medizin III
- Confocal laser endomircroscopy of gastrointestinal diseases (e.g. tumors, inflammatory diseases, pathogens) and metabolic changes (e.g. intestinal barrier interactions)
- Video capsule endoscopy (e.g. external magnetic control studies)
- Biliary interventions (e.g. metal stents, endoluminal radiofrequency ablation, photodynamic therapy)

Eferl Lab
Institute for Cancer Research
- Development of methods for histomorphometric analysis of IHC- and IF-stained tumor tissue sections (nuclear and cytoplasmic staining intensities; vessel density and vessel size distribution in tumor tissues; TMAs) using a slidescanner for bright field and fluorescent scans & Definiens Tissue Studio and Developer software for quantitative histomorphometry.

Ellinger Lab
Centre for Anatomy and Cell Biology
- Electron microscopy, immune electron microscopy, high pressure freezing
Correlative light – electron microscopy – 3D-electron tomography
Development of combinations of cryo- and labelling techniques
- Scientific focus on cell biological aspects of membrane dynamics: secretion, endocytosis, Golgi apparatus, autophagy/apoptosis, cellular stress, exosomes

Filipits Lab
Institute for Cancer Research
- Identification of prognostic and predictive Biomarkers in malignant diseases.
- Imaging, analysis and quantification of protein expression in tissue samples.

Grusch Lab
Institute for Cancer Research
- Growth factor-induced signals in cancer cells and tissues; development of light-activated growth factor receptors as optogenetic tools.

Hainfellner Lab
Institute of Neurology
- Histology and immunohistochemistry-based investigation of neurological diseases
- Confocal laser scanning microscopy
- Virtual microscopy, digital image analysis of histology slides
- Scientific focus on brain tumors, neurodegenerative diseases, neuorimmunological conditions, orphan diseases

Hitzenberger Lab
Center for Medical Physics and Biomedical Engineering
- Development of novel OCT technologies
- Polarization sensitive OCT, Doppler OCT, multibeam OCT
- Development and application of ophthalmic imaging techniques

Kittler Lab
Universitätsklinik für Dermatologie
- Dermatoscopy of neoplastic and inflammatory skin diseases
- Sequential digital dermatoscopy of melanocytic lesion
- *In vivo* confocal microscopy of the skin
- Image analysis and computer assisted diagnosis of melanoma
- Full body photography
- Virtual pathology
- Teledermatology

Lassmann Lab
Center for Brain Research
- Development and application of methods for immunocytochemistry, confocal laser microscopy, immune electron microscopy and in situ hybridization for the use on archival brain tissue from animal studies and human autopsies and biopsies.
- Scientific focus on immunopathology of inflammatory diseases of the nervous system.

Leitgeb Lab
Center for Medical Physics and Biomedical Engineering
- Functional Tissue Imaging with OCT (microangiography, elastography)
- Development of swept source lasers for parallel OCT
- Quantitative blood flow assessment using Doppler OCT with Schmetterer Lab
- Quantitative phase microscopy and dispersion contrast imaging
- Ocular Biometry system development
- Development of digital adaptive optics and refocusing algorithms
- Wavefront engineering using Bessel beams
- Ocular holography

Mikulits Lab
Institute for Cancer Research
- Crosstalks of growth factor receptors in hepatocellular carcinoma progression and metastasis.
- Development of novel tumor models to study the dissemination of liver cancer cells during the progression of hepatocellular carcinoma.
- Mechanisms of post-transcriptional control of liver metastasis.

Pircher Lab
Center for Medical Physics and Biomedical Engineering
- Development of adaptive optics OCT, adaptive optics SLO, Polarization sensitive OCT (together with Hitzenbeger Lab), coherence microscopy, contrast enhanced OCT

Scheinecker/Kiener Group
Klinik für Innerer Medizin III
- Study cell behavior in 3D micromass tissue cultures remodeling the synovial tissue

Schmid Lab
Institut für Gefäßbiologie und Thromboseforschung
- Laser scanning microscopy of live cells
- Live cell microscopy with fast monochromator, filter wheel and CCD camera
- Dynamics of signaling molecules: FRAP (fluorescence recovery after photobleaching); shuttling between subcellular compartments (by FLIP, fluorescence loss in photobleaching)

- Imaging protein interactions by FRET microscopy (fluorescence resonance energy transfer)
- Separation of overlapping fluorophores by spectral imaging
- 3D-microscopy by z-sectioning
- optimization and further development of fluorescent proteins (including photoactivation, photoconversion)
- Outlook: Establishing the CRISPR/Cas9 genome editing technology to label endogenous proteins (in the genomic locus) with fluorescent proteins
Tissue cytometry (single cell recognition and analysis using CellProfiler, ImageJ, TissueFAXS) – for fluorescence and IHC > conversion of analysis results into a fcs-file format allowing analysis, gating and statistics with flow cytometry software
Genetically engineered mice and patient samples
Imaging of inflammation and cancer processes
Inflammation and vascular diseases (atherosclerosis, thrombosis…)

Schmetterer Lab
Center for Medical Physics and Biomedical Engineering
- Ultra-high resolution OCT for imaging of the pre-corneal tear film and corneal pathologies
- Estimation of biomechanical tissue properties using Low Coherence Tissue Interferometry (LCTI)
- Doppler OCT for quantification of retinal perfusion in humans and rodents
- Doppler OCT for reconstruction of blood flow velocity vector fields in human retinal vessels
- Thermal light tear film imaging via FD OCT
- Assessment of red blood cell flux via a line illumination optical scheme

Schöfer Lab
Centre for Anatomy and Cell Biology
Epigenetic control of cell differentiation at cellular and at organism level. At cellular level we study the dynamics of nuclear architecture of cells undergoing differentiation or de-differentiation processes
- live cell imaging to study expression of one or several fluorescent molecules simultaneously (inverted microscope)
- 3-D imaging of fixed specimen: cells, small tissues and embryos ((whole-mount-) stained, transgenic)
- Transmission electron microscopy (molecular and genetic markers)
- Correlative microscopy
- Histology of human and vertebrate systems (serial sectioning, detection of genetic and molecular markers (IHC, hybridizations))
- Establishment of high-throughput embryo imaging

Sibilia Lab
Institute for Cancer Research
- Qualitative and quantitative analysis of immune cell infitrates (cancer and inflammatory disease models).
- Efficacy of anti-tumor therapies.
- Analyzing mechanisms in organ morphogenesis (skin, brain, liver, bone; model organism).

Sora Lab
Centre for Anatomy and Cell Biology
- Ultrathin slice plastination for mesoscopic anatomy (0.5 – 1.5 mm)
- 3D reconstructions of connective tissue pathways and gross anatomy specimens
- Morphometric evaluation of arthroscopic approaches using the plastination techniques

Stockinger Lab
Center for Hygiene and Applied Immunology
- Up to 18 parameter single cell analysis by flow cytometry for phenotyping and expression profiling of cells
- Imaging of cell functions (eg. Ca^{2+}, phagocytosis, oxidative burst, intracellular pH) by microscopy and flow cytometry
- Imaging of molecular interactions by FRET
- Multiplex analysis of immunoblots

Weninger Lab
Centre for Anatomy and Cell Biology
- Development of methods for imaging tissue samples (model organisms & human)
- Development of multimodal imaging pipelines
- Researching the mechanisms driving cardiovascular morphogenesis & remodeling
- Phenotyping mouse embryos
- Human gross anatomy & clinical cadaver studies

Gröger - Core Facility "Imaging"
We support projects with need of light microscopy from sample preparation to imaging and data analysis. Since the projects are widely divergent, we have to go into detail in every single project. We work out these projects together with our users and if necessary also with the help of cooperation partners and cooperating facilities. To screen for projects with scientific input of the facility, please refer to http://corefacilities.meduniwien.ac.at/imaging/publikationen/
Methods supported:
- Sample Preparation (Tissues, Cells)
- Confocal Laser Scan Microscopy (Tissue, Cells, Live Cell, 3D and 4D, FRET, FRAP, Ca^{2+}, Spectral Imaging)
- Bright field/ Fluorescence microscopy (Fixed Samples, Tissue, Cells, Tissue whole mount – long distance objectives)
- Flow chambers (Cultivation and Observation of Cells under physiological Flow)
- TissueFAXs (Fluorescence/ Bright field Slide and Plate Scanner) with analysis programs HistoQuest, TissueQuest and soon StrataQuest
- Data analysis (Arivis4D Browser; Coloc, FRET; Huygens Deconvolution; Fiji – Particle Tracking, Cell Counting, Coloc, …