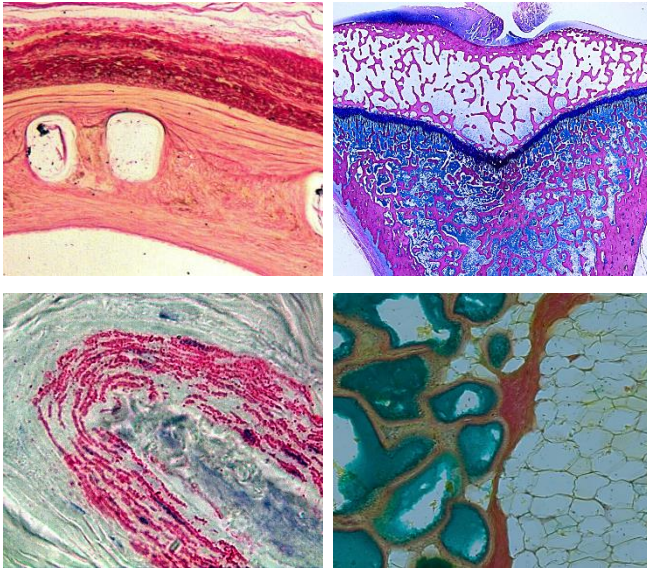


Advanced Histology Services



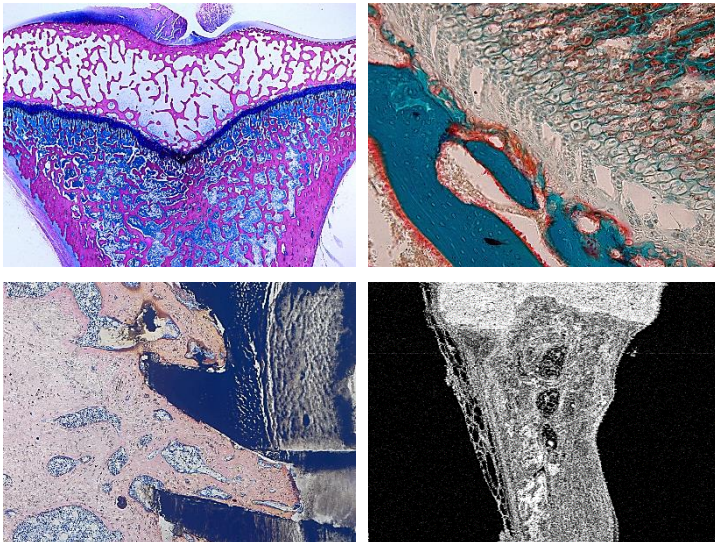
Orthopedics
Osteology
Oro-facial research
Cardio-Vascular Medicine
Regenerative Medicine
Tissue Engineering

Hard Tissue
Implants
Biomaterials

Laser Microtomy

Laser microtomy can overcome fundamental limits of classical (hard tissue) microtomy and ground sectioning technology required for histological analysis in medical device and implant development:

- **Fast and easy** cutting of **undecalcified** hard tissue and a broad range of implants and biomaterials
- **Semi-serial sectioning** based on minimal material loss possible
- Minimization of sectioning artefacts due to **contact free cutting**
- Preservation of the implant-tissue interface
- **Quality control** of sectioning via Optical Coherence Tomography



Upper left: Dog tibia, McNeal

Upper right: Rat knee, Masson Goldner

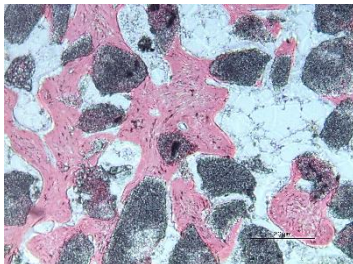
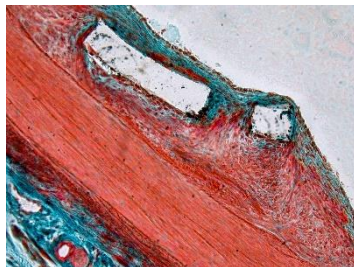
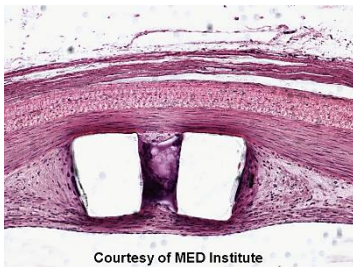
Lower left: Rat tibia with dental screw, SRS/van Gieson

Lower right: OCT of rat tibia with polymer implant

Fields of Applications

Main applications of laser microtomy derive from:

- **Osteology and Orthopedics** (non-decalcified hard tissue and implant interface research).
- **Cardiology and Cardiovascular Research and Medicine** (soft tissue with biomaterials and stents, calcified plaques).
- **Regenerative Medicine and Tissue Engineering** (implants, scaffolds).
- **Oro-facial and Dental Medicine** (non-decalcified hard tissues with metal, ceramic or polymer implants).
- **Oto-laryngeology and Audiology** (e.g. cochlea, implants).
- **Preclinical studies** from mouse to large animal models.



Upper left: Pig artery with stent, H&E

Upper right: Rabbit artery, Masson Goldner

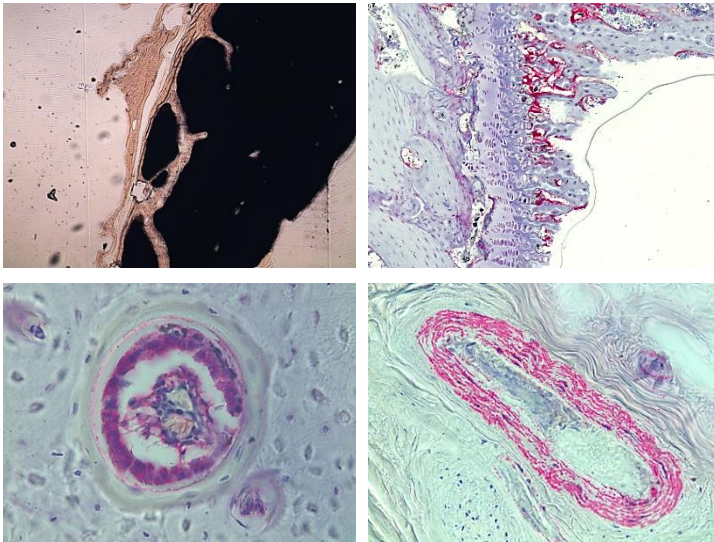
Lower left: Bone regeneration on TCP particle, SRS/van Gieson

Lower right: Mouse cochlea, SRS/van Gieson

Histology Services

We are your partner for advanced histology services performed with laser microtomy. We offer service, support and development in following fields:

- **Qualified consulting** for specimen hard to cut with mechanical methods.
- Histology services from **fixation, resin embedding, cutting** and **staining** including a broad range of histological, histochemical and immunohistochemical stainings.
- Development of **customized protocols** and **staining methods** for plastic embedded sections.
- **Customized sectioning** e.g. for synchrotron or μ CT analysis.
- **Customized specimen preparation** beyond histology, e.g. 3D cutting of native tissue



Upper left: Rabbit skull, von Kossa,
Upper right: Mouse tibia, TRAP,
Lower left: Dog mandible, Osteopontin IHC,
Lower right: Dog mandible, SMA IHC

Specimen Preparation and Imaging

Embedding



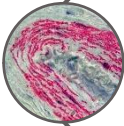
- Performing embedding in Methyl Methacrylate or Epoxy resins for routine sectioning of non-decalcified hard and soft tissue
- For special purposes (e.g. solvent sensitive implants or biomaterials), we choose and test alternative embedding materials and protocols.

Sectioning



- Laser microtomy generates thin sections of non-decalcified hard tissue in adequate thickness and quality as well as thin sections of implanted tissue

Staining



- A broad range of routine histological and histochemical stainings is available.
- Development and application of immunohistochemistry protocols for animal tissue and human tissue covering a range of immunohistochemical markers.

Imaging by Optical Coherence Tomography



- Integrated OCT-imaging technology provides navigated 2D- or 3D-imaging and cutting, facilitating analysis and dissection of samples.
- Assists in the definition of cutting pattern, assessment of the cutting quality or measurement of distances.

TissueSurgeon

OCT-image Guided Laser Microtome

The laser microtome **TissueSurgeon** is a multi-purpose sectioning instrument, which enables precise and **contact free cutting** of biological samples and a broad range of biomaterials and materials. Based on **femto-second laser technology**, it can be used for sectioning, structuring or gentle extraction of samples and materials in **2D and 3D** for analysis. Fundamental limits of mechanical tissue preparation can be overcome when it comes to **cutting of hard tissue, implanted tissue** or difficult to cut materials.



TissueSurgeon

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