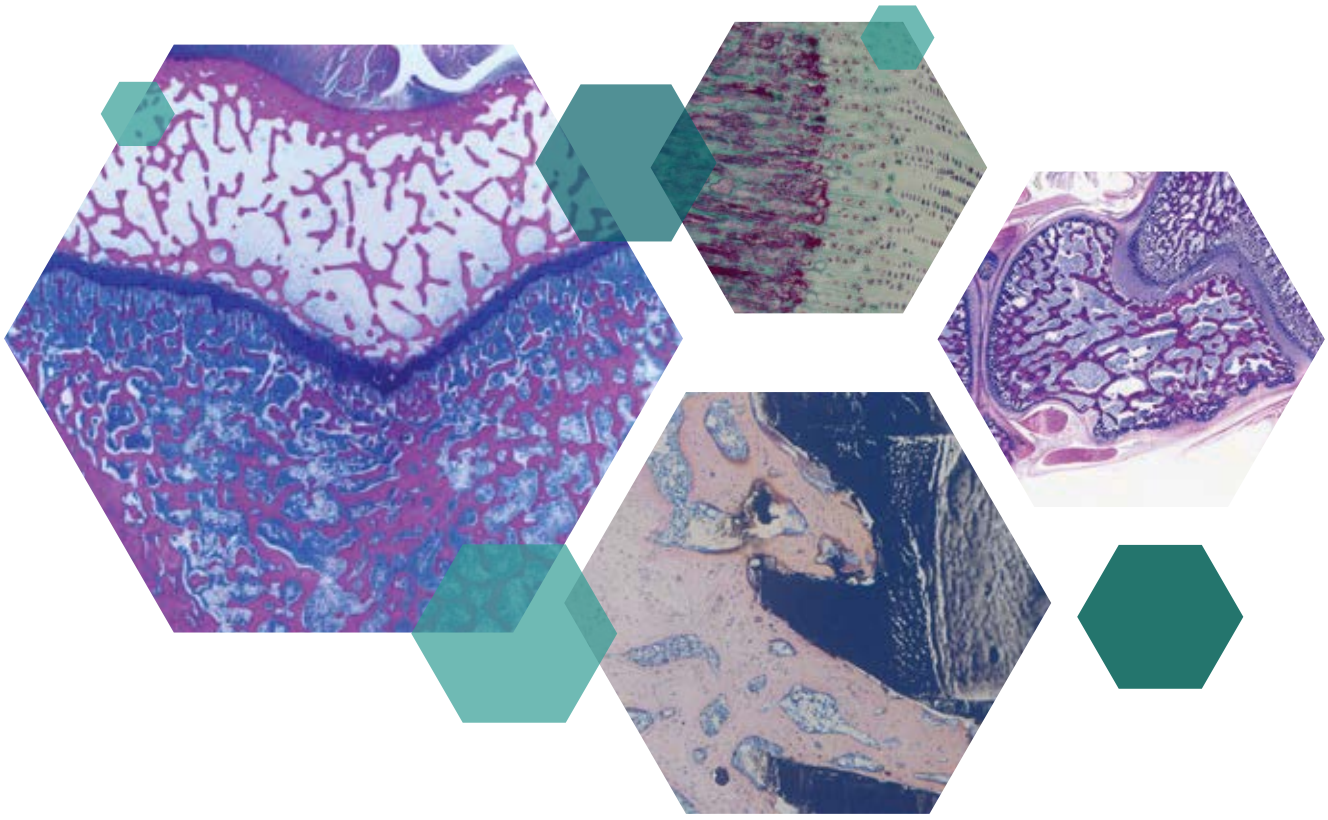
PATHO-LOGICA Ltd
Experimental Pathology Laboratory Services

PLASTIC EMBEDDING FOR CALCIFIED TISSUES AND MEDICAL DEVICE IMPLANTATION

Advanced Laser-Based Preparation of Biological Tissue and Materials

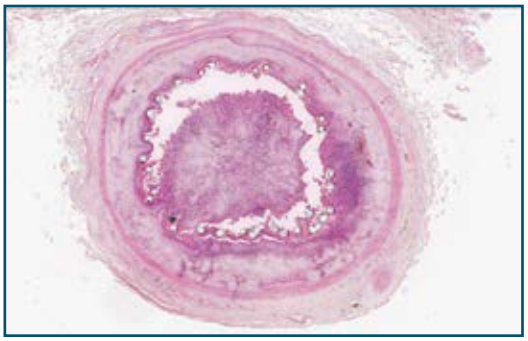
Dr. Emmanuel Loeb

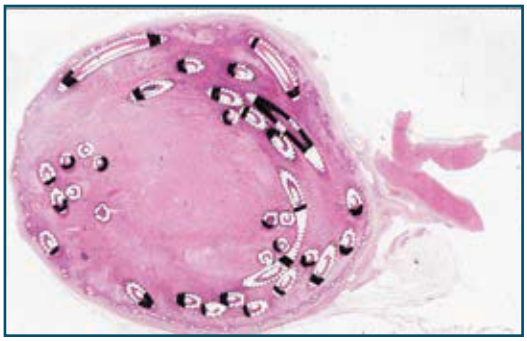


Introduction:

Plastic embedding was originally designed for bone histology, to avoid the decalcification process and later it was adjusted to solid, and implanted medical device research:

- Perfect method for rigid devices.
- Suitable for morphometric digital evaluation.
- Compatible with most staining procedures, including IHC.
- Laser microtomy – Advanced technique for delicate fine sections production. Relatively thin sections up to 8-15 micron
- High quality slides for documentation.
- Usually used for bone pathology, cardiac stents, tooth implants, orthopedic hard devices, regenerative medicine and tissue engineering (implants, scaffolds), preclinical studies of small to large animal models.





* An example of a medical device implantation in a goat vein.

The process:

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.

→

- Soft tissue reduction surrounding the device and the planning of the right position of the cross section(s) are critical for the analysis; allows getting a representative image of the implantate.

Sectioning

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

→

- Laser microtomy is very accurate method and should be planned in advance with care by the pathologist.

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.

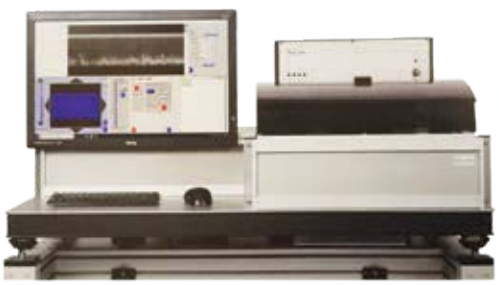
→

- We recommend to perform always the H&E stain for the general pathology and then consider other special stains or IHC for specific histological findings depends on the scientific hypothesis question.

The advanced laser dissection:

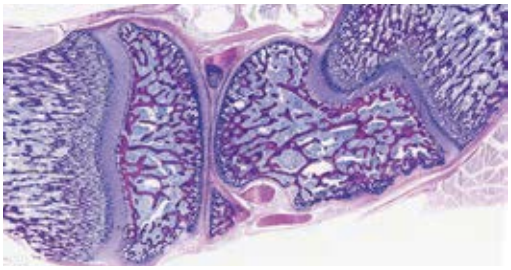
Laser microtomy can overcome fundamental limits of classical (hard tissue) microtomy and ground sectioning technology required for histological analysis in medical device and implant development.

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

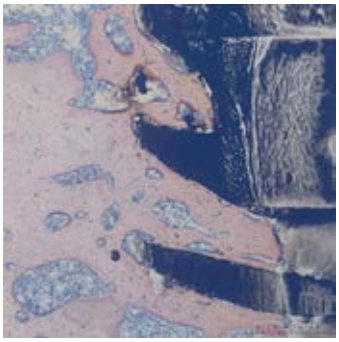


Some nice examples from our records

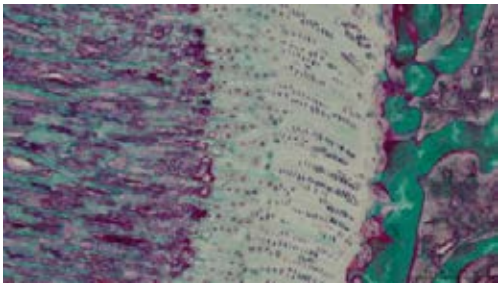
Rat knee, McNeal



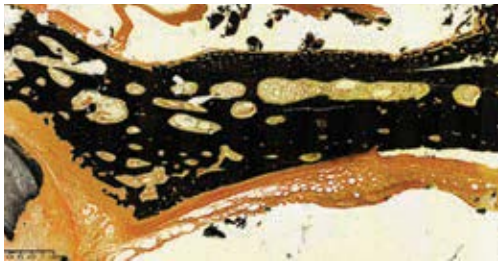
Rabbit femur with dental screw,
SRS/van Gieson



Rat knee, Masson Goldner



polymer bone, Von Kossa stain.



3 Golda Meir St. P.O. Box 4082 Scientific Park, Ness Ziona 7403648 Israel
info@patho-logica.com 972-8-6190100 www.patho-logica.com