WHAT WE DO

We operate as a team of four research histologists and one comparative pathologist to provide a diverse portfolio of services for processing and analyzing a multitude of tissues from various model organisms and systems. In doing so, we enable researchers to insightfully evaluate the morphological manifestations of normal and perturbed biological functions.

**Bone remodeling mediators have promising potential for cancer therapy**

The tumor necrosis factor receptor superfamily member 11A (TNFRSF11A / RANK) and its ligand, the tumor necrosis factor superfamily member 11 (TNFSF11 / RANKL) is a key mediator of bone remodeling as well as immune signaling. Researchers in the group of Dr. Josef Penninger (IMBA) along with their collaborators, demonstrated that TNFRSF11a signaling modulates malignancy in breast and lung cancer models associated with specific genetic mutations. They showed that genetic ablation or pharmacologic inhibition of RANK signaling hampers malignant progression in these cancers. Consequently, explorations on the preventative and therapeutic applications of RANK/RANKL inhibitors in such cancers are underway. Evaluation of tissue phenotypes and quantification of lesional parameters were important components of these studies and were enabled by pre-analytical and analytical support provided by our facility.

**Brain tissue grown entirely in a dish can model aspects of brain cancer**

“Three-dimensional multicellular stem-cell-derived constructs that mimic in vivo tissue,” also called organoids, were named Method of the year 2017 (Nat. Methods. 2018 Jan; 15(1): 1). Researchers in the group of Dr. Jürgen Knoblich (IMBA) had been instrumental in establishing human cerebral cortical organoid models. They then sought to study whether these organoids could recapitulate aspects of human brain cancers. With the introduction of specific mutations, the organoids did indeed mimic certain molecular and histologic features of brain cancers and retained their neoplastic growth potential on in vivo implantation. The necessary histologic characterizations and comparative analysis of neoplastic features were enabled by pre-analytical and analytical support from our facility.
SERVICES AND METHODOLOGIES

Our services encompass tissue processing, routine histologic stains, a growing repertoire of immunostaining and *in situ* hybridization methods, and comprehensive analyses. We adopt a customized project-specific approach to the provision of our services which include:

- **Experimental design and protocol planning**
- **Preanalytical procedures**
  - Sample collection, fixation, and processing
  - Cryo- and paraffin embedding and sectioning
  - Staining
- **Analytical services**
  - Consultations and reviews
  - Microscopic analyses of morphological features
  - Documentation (image panels and texts)
  - Digital quantification (in collaboration with the Biooptics Facility, IMP)
  - Manuscript support

EQUIPMENT

- **Automatic immunostainer - Bond III** is a fully automated immunostainer with the capacity for 30 slides per run. It can perform immunohistochemistry on with the DAB or AP-red detection systems with running times as short as 3 hours to deliver consistent staining output.
- **Intavis Insitu Pro** is a fully automated stainer for *in situ* hybridization and immuno-histochemistry on whole mounts, vibratome sections, thin sections on slides, and cells on coverslips.
- **Tissue dehydrator LOGOS Microwave Hybrid Tissue Processor** performs automatic tissue dehydration, clearing, and paraffin infiltration and can process 210 tissue blocks per run, with any kind of tissue up to 6 mm in thickness.
- **CryoStar™ NX70 Cryostat** is a microtome to section frozen or cryo-embedded tissues allowing a section thickness range from 0.5 to 100 µm. The temperature for the specimen clamper is controlled and ranges from 10°C to -35°C.
- **Rotary microtomes (MICROM HM 355 and MICROM HM 355S)** are heavy duty microtomes used for paraffin sectioning, allowing a section thickness range from 0.5 to 100 µm.

CONTACT AND LOCATION

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