

Jürgen Veeck¹, Philipp Leusmann¹, Jörg Jäkel¹, Cord Spreckelsen², Ruth Knüchel-Clarke¹ and Edgar Dahl¹

¹Institute of Pathology; ²Institute of Medical Informatics, University Hospital of the RWTH Aachen

Room Concept of cBMB Labs

The implementation of the biomaterial bank into the ISO17020 accredited Institute of Pathology warrants a high degree of operational functionality as well as optimal biobank security. The pre-analytics lab is situated directly attached to the intraoperative rapid sectioning lab (Figure 1A) facilitating fast processment of samples and reducing ischemia times. Two further labs are established in close proximity within the cBMB core unit. One lab is dedicated to quality management (QM) activities while the second lab will provide the opportunity to conduct own research activities on biospecimen quality. Finally, a large-sized (50 m²) central biospecimen storage (in construction) will contain all storage freezers and nitrogen tanks. Note that the core unit as well as the pre-analytics lab are entrance-secured and are only accessible to approved staff members.

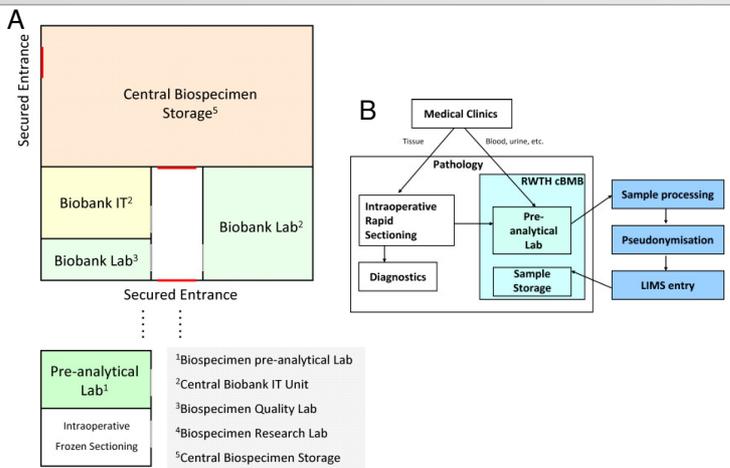


Figure 1. Infrastructure of the RWTH cBMB laboratory. (A) Room concept of the RWTH cBMB labs. Pre-analytics, QM and research labs are all in close proximity. (B) Workflow of the biomaterial from the clinics via the cBMB laboratory to the central storage.

Biomaterial Workflow

Tissue biomaterials are provided by the clinical departments to the intraoperative rapid sectioning for diagnostic purposes, where, in parallel, excess material is obtained and transferred to the pre-analytical lab (Figure 1B). Liquid biomaterials are transferred directly to the pre-analytical lab. Samples are immediately processed, pseudonymized, entered into StarLIMS. After obtaining storage information, samples are transferred to the central sample storage unit.

Biomaterial Processing

Solid tissue samples (e.g. tumor and corresponding normal tissue) at a preferred size of 1 cm³ are currently snap-frozen in liquid nitrogen and stored together with its pseudonym in plastic bags, providing a space- and time-efficient way to store and handle large sample numbers (Figure 2). Liquid biomaterials, such as blood and urine, are first centrifuged and then divided into 1 ml aliquots. Together with its pseudonyms, all samples are immediately transferred to the central biospecimen storage unit and kept at -80°C until use.

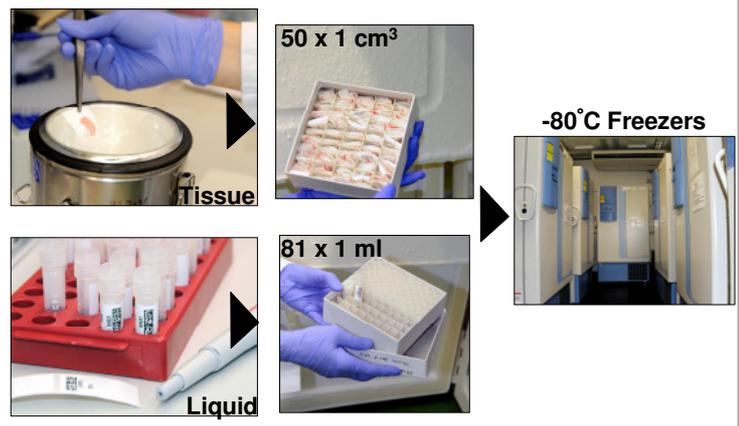


Figure 2. Biomaterial processing at RWTH cBMB. Snap-frozen solid tissues (upper part) are stored at 50 samples/box in plastic bags, while liquid samples are aliquoted at 1 ml and stored in cryotubes at 81 samples/box (lower part). All samples are transferred to freezers and stored at -80°C.

Standard Operation

All processes of handling biomaterial at RWTH cBMB are performed according to protocols defining standard operating procedures (SOPs). These SOPs describe in detail the protocols for tissue obtainment, sample pre-processing, data management, cryo-preservation, sample storage, and sample provision. SOPs are defined according to current guidelines and best-practice protocols, e.g. provided by the International Society for Biological and Environmental Repositories (ISBER). In addition, SOPs are constantly evolved and complemented according to own research activities on biospecimen quality.