Tissue Bank of the National Center of Tumor Diseases (NCT) Heidelberg
At the Institute of Pathology, University Hospital Heidelberg

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Leiterin der Gewebebank des NCT
Aspects

- **Structural Decisions**
- Ethical Aspects and Data Protection
- Finances and Sustainability
- Sampling and Platform Activities
- Project Management
- Quality Management and Accreditation
- Parameters of Performance and Statistics
- Interaction of Tissue Banks
Aims

• Central and comprehensive **tissue bank structure**

• **Research not collective-orientated:** ’Making research possible‘

• Comprehensive **ethical/legal frame**

• **Quality assessment:** ’Good scientific practice‘; quality management

• **Integration** of clinical and pathological experts; support of CCC/NCT-concept; role model

• **Technology platform and development**
Tasks

• Pro- und retrospective collection of tissues; optimal scientific use of tissues

• Compilation of tissue collectives, links to clinical data (Data Pool)

• Technology-platform (Multi-Tissue Arrays, Virtual Microscopy; IHC)

• Quality management (controls [good scientific practice], accreditation)

• Project management (broker funktion; management; training)
Structural Association

• Affiliation
  Section of the NCT

• Operators
  University Hospital Heidelberg
  German Cancer Research Center (DKFZ)
  Thoracic Hospital Heidelberg

• Curator
  Institute of Pathology, University Hospital Heidelberg

• Association
  Biomaterialbank Heidelberg (BMBH)
Participating Units:

University Hospital Heidelberg
• Pathology
• Gynaecology
• Haematology (Plasmacytoma)
• ENT
• Neurosurgery
• Orthopedics
• Urology
• Visceral Surgery
• ZMK

German Cancer Research Center

Thoracic Hospital Heidelberg Rohrbach
Regulatory Activities

- Standing orders (2005)
- Affiliation, Operation (2005)
- Fixed Personnel and hardware budget (2005)
- Standard Operating Procedures (2005-7)
- Quality Management (since 2006)
- Accreditation DIN/ISO 17020 (since 2009)
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Ethical/Legal Issues

• Review of ethical issues
  • Comprehensive ethical vote (2005; project independent)
  • Open use of retrospective tissue collective (2005)

• Informed consent
  • Uniform informed consent form (2006)
  • Hospital contract (2009) (automatic negative information)
  • Eigenforschungsvorbehalt (BW)

• External/Research foundations
  • Acceptance by DFG, Krebshilfe (2006)

• Data safety issues
  • Access regulations
  • Pseudonymisation
  • Data safety rules (Pis, Standing orders)
  • Data safety reviews
Biobank - Safety Concept

Pseudonymisation
  • Coded for user
  • Can be broken by tissue bank
• Separated data banks and –storage
• Admission control
• Regulations of standing orders
• Instructions of personnel
• Material Transfer Agreement (Instruction user)
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- Future Directions
Sustainability

- Key issue of all tissue banks; value increases with time!

- Should be mandatory *ab initio* for all tissue banks/collectives! Mostly unsolved!

- Aspects (financial and organisational)
  - Sustained Financing
  - Governing Institution; Accession Rules
  - Policy of Termination

Financing

- Permanent budget by NCT
- Free service for participants
- Add-on funding
  - Pathology
  - Grant participation (core functions)
  - Special fees (TMAs)
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Paraffin Tissues

- Paraffin archive, Institute of Pathology
- >30y, RT, organized, designated rooms
- 16y full searchable (IT)
- Specified ethical vote (Institute of Pathology)
- Project-based access for Tissue Bank (contract)
- Primary blocks remain part of Tissue Bank (fully retrieveable)
Storage Conditions
Frozen tissues

- Specified -80° C freezers
- Climatized freezer rooms
- Regular daytime check (7 d; documented)
- Individual freezer alarm
- 24 h automatic centralized alarm system for all freezers
- Designated on-call person (schedule)
- 2 stand-by running freezer; -20° C room
- Emergency electricity supply
Storage Locations

- Institute of Pathology (Core Unit)

- Decentralized Facilities
  - Thoracic Hospital/Thoracic Pathology
  - Neuropathology/Neurosurgery
  - Orthopedics
STARLIMS-Modul Scan/Reception

- Fast registration of **single samples** via **handheld scanners**
- **Automatic allocation** of collective, material, patient-ID, filling volume
- **Integrated error checking** via regular terms
- **Controlling streamlined for touchscreen**
Central Laboratories NCT Tissue Bank

- Paraffin- and frozen sections
- HE and special stains
- Multi-Tissue-Arrays (manual and \textit{automated})
- Immunohistology (automated)
- Registration and storage of frozen tissues
- Compilation of paraffin tissue collectives
- Reference service and training
Heidelberg TMA Facility at NCT Tissue Bank

- Single location core facility
- Instrumentation (2 manual; 1 semiautomated)
- Lab, archiving, trained personnel
- >150 TMAs; ~300 projects
- Documentation, image analysis, bioinformatics (VM platform)
- Collective oriented (clin. data, epidem. trials)
- Consortional center function (natl./international trials)
- Central TMA-management function; linked to VM core
- Future: automated work-flow
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<td>1. Tissue characterisation and quality control (entry/exit control)</td>
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<td>2. Regulations</td>
<td>2. Project evaluation and management</td>
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<td>3. Internal and external review system</td>
<td>3. Project tracking and documentation</td>
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# SOPs of NCT Tissue Bank

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<td>Exit control of requested material including expert pathological-anatomical report</td>
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<td>Withdrawal of consent</td>
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Accreditation NCT Tissue Bank

• Since 2005 SOPs, 1st generation
• Since 2006 SOPs 2nd generation
• Since 2006 defined quality management system
• Request to Sector Comitee of DAkkS by NCT Tissue Bank (2007)
• General approval by DAkkS (2007)
• Application of NCT Tissue bank for Accredition (2008)
• Inspection (November/December 2008) by Deutsche Akkreditierungsstelle according to DIN EN ISO/IEC 17020:2004
• Formal accreditation (04/09)
• Official Audit and extension of accreditation (6/10)
• Reaccreditation 01/2014
Quality Tissue Materials

- >50% of studies using homogenised human tissue derivatives relies on insufficiently characterized/documented starting material and is thus absolutely unreliable (→ Perren Nature 2011)
  - Expert-evaluation (diagnosis, quality, composition of collective)
  - Trial specific parameters
  - Standardized entry- and exit-controls
  - Standard reporting and documentation
  - Advice

- Good scientific practice in pre-experimental tissue assessment and selection is the decisive basis of work with human tissues

- Significant scientific contribution
Tissue quality

• Processing of material according to scientific questions

• Projects need different quality
  • Type of material (FFPE vs. Fresh Frozen)
  • Immunohistochemistry vs. Homogenisation

• Provision of pathological findings (exit control) = quality control

• Compilation of a delivery protocol which comprises a MTA (instructions for the proper use of samples, citation rules for publishing, etc.)
Tissue quality

Pathological-anatomical report
Continual improvement – „Error/fault“ management

- Active error/fault management
- Registration of faults
- Tracking: registration of criticism and customer satisfaction
- Implementation of corrective actions
- Training courses
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NCT Tissue Bank - Project management + Tracking

- Application standard form
  - Review (conformity, feasibility) by tissue bank; contact to PI
  - Review by Managing Board
  - Partners (Histo&Clinic)
  - Project work (TA&Med)
  - Material transfer (MTA)
  - Tracking (90/180 d)

Herpel et al., Der Pathologe (2008)
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Project status

• Projects: 1568 (02/2015)
  • Completion rate: 95%

• Multi-Tissue-Arrays: >130

• Frozens: 30.000 (without aliquots)
  • Access to paraffin archive (>500.000)
Statistics

- Publications with tissue material until 2014: >180 + ~10
- Participation at various conferences (poster, presentations, chairman, expert activities)

Feedback of project leaders

Tracking bis 11/2014

- positiv: 920
- weniger gut: 6
- negativ: 4
- keine Antwort: 135
Consent – a Problem?

• Analysis admission contract (2015): 1.2% rejection
• Analysis tissue bank (2015): 0.98% rejection
• Less than 4 post hoc withdrawal of consent

Very high consent rate
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- **Interaction of Tissue Banks**
Consortional Projects

- Local: BMBH

- Population-based national and international epidemiological studies (DACHS, IMPACT, EPIC (colon/pancreas Germany), ColoCare, Helmholtz-Cohort)

- National Research Consortia (KOSAR (Sarcoma); SFB/TRR77 (HCC), SFB 1118 (diabetes))

- Clinical Trials (e.g. INNOVATION)
Participation in German Centers for Health Research (DZG)

DKTK
Prof. Dr. Peter Schirmacher
PD Dr. Esther Herpel
Dr. Melanie Herzog

DZIF
Prof. Dr. Peter Schirmacher
Dr. Felix Lasitschka
Dr. Lotte Schmidt

DZHK
Dr. Tanja Weiss
HCB → BMBH

DZL
Dr. Thomas Muley
Biobank Thoraxklinik
→ BMBH

- National cohort (NatKo)
NCT-Gewebebank

Die Gewebebank ist eine Einrichtung des Nationalen Centrums für Tumorerkrankungen (NCT) Heidelberg unter der Schirmherrschaft der Medizinischen Fakultät der Universität Heidelberg und des Deutschen Krebsforschungszentrums (DKFZ).

Zweck der Gewebebank ist das Sammeln, Charakterisieren, Registrieren, Archivieren und Aufarbeiten von Geweben und Gewebsextrakten (z. B. in Tissue-Micro-Arrays) in hoher Qualität für wissenschaftliche Untersuchungen im Rahmen der Tumorforschung.


Daher besteht für Mitarbeiter der oben genannten Gruppen die Möglichkeit, Gewebeproben und Paraffinschnitte von Multi-Tissue-Arrays aus der Gewebebank unter Darstellung des Verwendungszweckes zu erhalten, um diese im Rahmen von wissenschaftlichen Fragestellungen untersuchen zu können.

Entsprechende Anträge finden Sie unter Downloads.

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