The PATH Biobank - procedures and results of a breast cancer biospecimen research resource

Anzeneder T, Mayer C, Ohlms U, Schmitt DC, Waldner C, Büttner R, Bodenmüller H;
Foundation PATH, Munich, Germany

Disclosures

DISCLOSURES: Foundation PATH has received donations and has sponsoring relations with the following companies: Amgen, AstraZeneca, GlaxoSmithKline, Novartis, Pfizer, Pierre Fabre and Roche.

Abstract - Introduction

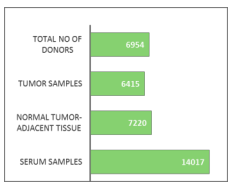
The purpose of PATH is to provide high quality fresh frozen breast cancer specimen for research, annotated with highly differentiated datasets. To this end, we have developed and established standardized methods for collection, processing, labeling, longterm storage, retrieval and distribution of the specimen. PATH is a non-profit, patient-driven biobank in Germany.

Procedures

1. Decentralized biorepository

At seven Institues for Pathology, being part of certified German breast cancer centers

- Unique SOPs
  For processing, labelling and long-term storage
- Fresh frozen conditions
  Using vapor phase of liquid nitrogen
- Tumor tissue
  Edge length at least 3 mm
- Normal adjacent tissue
  Edge length at least 3 mm
- Blood serum aliquots
  Minimum volume of 1ml

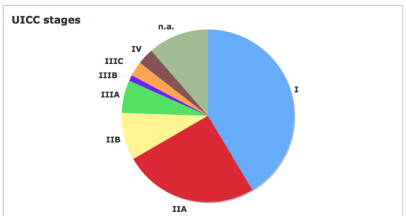


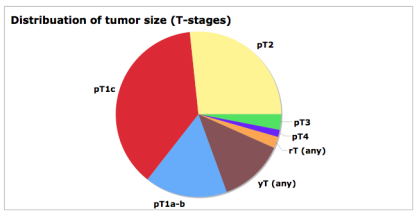
2. Centralized database

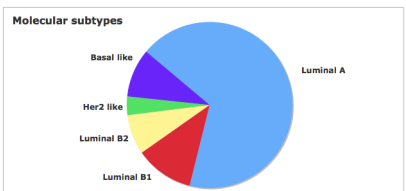
- Data storage using Oracle® software
  Containing an in-house LIMS solution
- Standardized broad informed consent
  Ethical approval (University of Bonn)
- Collection of follow-up date
  Directly questioning the breast cancer patient

Results - Biobanking

Since 2004, more than 7,200 breast cancer patients have given informed consent. From 59% of all donors a tumor tissue specimen could be stored. The same applies to 62% of all cases in accordance to adjacent normal tissue specimen and in 92% with blood serum samples.



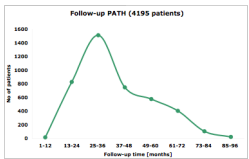




- Subtypes according to St. Gallen International Expert Consensus, Tumor Grading as surrogate marker for Ki-67 expression(1), (2)
- The distribution of the molecular subgroups is comparable to published distributions(3)

Results - Follow-up

In a sub-cohort, comprising the years of diagnosis 2006 - 2009, 76% of all individuals could be reached through follow-up inquiries by PATH. Subsequently, in a test-collective (108 patients, 4.8 years median follow-up time) only 5% were "lost to follow-up".



Follow-up informations contain self reported data and are validated by practitioners, registration offices and cancer registries

Reported follow-up events:

- distant metastases: 203
- local recurrence: 109
- death from any cause: 325

Using PATH Biobank

Researchers write a request for samples or data. These requests are reviewed by independent experts. PATH's managing board decides on sample allocation; a material transfer agreement is signed. A reimbursement for the samples and logistics is requested.

Research groups having used PATH Biobank applied different techniques successfully for their investigations. Several publications and presentations demonstrate the quality of PATH Biobank (4)(5)(6)(7).

References

(1) Strategies for subtypes - dealing with the diversity of breast cancer: highlights of the St. Gallen International Expert Consensus on the Primary Therapy of Early Breast Cancer 2011. Ann Oncol. 2011 Aug;22(8):1736-47.
(2) Applying the 2011 St Gallen panel of prognostic markers on a large single hospital cohort of consecutively treated primary operable breast cancers. Ann Oncol. 2012 Oct;23(10):2578-84.
(3) Defining breast cancer prognosis based on molecular phenotypes: results from a large cohort study. Breast Cancer Rac Treat. 2011 Feb; 126(1): 185–192.
(4) Comparison of MammaPrint and TargetPrint results with clinical parameters in German patients with early stage breast cancer. Int J Mol Med. 2010 Dec;26(6):837-43.
(5) Promoter hypermethylation of the tumor-suppressor genes ITIH5, DKK3, and RASSF1A as novel biomarkers for blood-based breast cancer screening. Breast Cancer Res. 2013 Jan 15;15(1):R4.
(6) Tamoxifen-Resistance in Breast Cancer: Reprogramming of the ERRa and ERa Target Gene Landscape. Under Review.
(7) AKT1 (E17K) mutation: coexistance with oncogenic alterations, prevalence, and correlation to clinical parameter in a large series of breast cancer patients. Proceedings AACR 2014, Abstract 569.