Blood Biobanking – Chances and Risks

The Bavarian Red Cross „Blood Donor Biobank“
Outline

- Types of biobanking
- Why blood biobanking?
- Why blood banks?
- Why the Bavarian Red Cross Blood Bank?
- The „Blood Donor Biobank“
- Chances and risks of blood biobanking
Different Types of Biobanks

- Genetic biobanks collect biological samples from the general population or particular subsets of individuals
- Disease biobanks collect samples from patients suffering from selected conditions
- Prospective banking of normal and pathological samples (leftover samples) collected during routine clinical pathology diagnostic procedures
- Prospective banking of samples collected from healthy volunteers
Two Models of Biobanking

**Collection of patient material**

**Collection of samples from healthy volunteers**

Enrollment

Sample and data collection

Enrollment sample and data collection

5 yrs follow up

10 yrs follow up

15 yrs follow up

Change in life style or health status?
Pitfalls Prospective Biobanks

- Reasonable number of participants required
- Time until a healthy individual becomes ill is not foreseeable
- High degree of compliance required
- High infrastructure, administration and storage costs
Why Blood Biobanking?

- Easy to access – convenient for donor (higher degree of compliance)
- Easy to collect – convenient for doctor/study nurse
- Easy to transport and to store – convenient for biobank operator
- Easy to analyse – convenient for researcher
Why Blood Banks?

- Blood banks are biobanks
  - Collection and storage of biological material and associated data

- Existing infrastructure for
  - Large volume operation
  - Sample traceability
  - Sample storage
  - Networking capability

- Well established standards for the manufacture of pharmaceutical blood products (experienced employees, GMP facilities, SOPs, regular audits)
Why the Bavarian Red Cross Blood Bank?

Red Cross Blood Banks
- The Red Cross collects one third of the 75 Mio blood donations that are collected annually worldwide
- In more than 20 countries (e.g. Australia, Japan, Belgium, Finland, Switzerland) blood supply is solely organised by the national Red Cross
- In 35 countries the national Red Cross is responsible for the predominant part of the blood supply (US, Austria, Germany)

The situation in Germany
- Red Cross Blood Banks are responsible for 80% of the blood supply
- 8 blood banks collect 4.5 Mio blood units of approximately 2 Mio blood donors
Why the Bavarian Red Cross Blood Bank?

- The Bavarian Red Cross Blood Bank

- Pharmaceutical company founded in 1953
- 6 institutes for transfusion medicine, 1 central production site and 1 plasma centre
- 20 blood drive sessions a day, 5 days a week
- 500,000 blood units p.a. collected from 400,000 donors
- > 33,000 laboratory tests daily
- > 700 Employees
- > 250 Medical doctors
- > 18,000 honorary helpers
The „Blood Donor Biobank“

- Reasons for a biobank at the Bavarian Red Cross blood bank

- Well characterised and large donor collective
- Over 4 Mio plasma samples stored in a fully automated and access controlled storage facility at -42°C
- Experienced in the conduction of epidemiological and diagnostic studies according to ICH GCP and other international and national guidelines
- Donors are willing to participate in research studies
Over 4 Mio samples stored at -42°C

Legally required plasma sample of every blood donation for potential follow up analysis

-42°C, access controlled and fully automated

Cold storage facility at the production site
Large donor population

400000 registered blood donors

Statistically only 1 in 200 donors develops a disease and 1 in 2 donors is willing to participate
The „Blood Donor Biobank“

- Available samples
  - Multiple plasma samples of one donor
  - Plasma samples taken every 6 months on average over a period of 7 years
  - Samples taken before the diagnosis of a disease
The „Blood Donor Biobank“

- Approval by the responsible ethics committee and data protection board
- Written informed consent of more than 10,000 donors
  - 5,000 healthy and active blood donors
  - 5,000 former blood donors diagnosed with a severe disease
    - Cancer
    - Heart disease
    - Diabetes
    - Cardiovascular
    - Stroke
    - CNS
    - Autoimmune, Asthma
  - Over 100,000 plasma samples for research projects
The „Blood Donor Biobank“

Our idea is to contribute to the identification of predictive biomarkers by providing samples collected before the diagnosis of a disease.
Blood Biobanking- Chances and Risks

■ Chances
  • Accessibility allows regular sample collection
  • Blood is routinely collected at blood donation sessions, hospitals, doctor surgeries
  • Blood collection is easy to standardise
  • Low collection, shipment and storage costs
  • Allows screening procedures

■ Risks
  • Only circulating biomarkers can be identified/analysed
  • Multiple operators, no standardised procedures
Thank You

Silke Martin
Bavarian Red Cross Blood Bank
Biobank Department
Department Head

Herzog-Heinrich-Str. 2
80336 Munich, Germany

Phone: +49 89/53 99-230
Fax: +49 89/ 53 99-246

E-Mail: s.martin@blutspendedienst.com