# Biobank

A biobank is a type of biorepository that stores biological samples (usually human) for use in research. Since the late 1990s biobanks have become an important resource in medical research, supporting many types of contemporary research like genomics and personalized medicine.

Biobanks give researchers access to data representing a large number of people. Samples in biobanks and the data derived from those samples can often be used by multiple researchers for cross purpose research studies. For example, many diseases are associated with single nucleotide polymorphisms, and performing genome-wide association studies using large collections of samples which represent tens or hundreds of thousands of individuals can help to identify disease biomarkers. Many researchers struggled to acquire sufficient samples prior to the advent of biobanks.

Biobanks have provoked questions on privacy, research ethics and medical ethics. While viewpoints on what constitutes appropriate biobank ethics diverge, consensus has been reached that operating biobanks without establishing carefully considered governing principles and policies could be detrimental to communities that participate in biobank programs.

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The significance of human biorepositories for modern medical research, particularly for comprehensive population-based genetic analyses, is constantly growing. While large and centralized institutions are usually considered best suited to meet the increasing demand for high-quality “biobanks,” most medical research institutions still host rather heterogeneous and fragmented biobanking activities, undertaken by clinical departments with oftentimes rather different scientific scope. Undoubtedly, most clinicians and medical researchers would appreciate infrastructural support in terms of the storage and handling of their biosamples, but they are also likely to expect access to their samples avoiding extensive formal requirements. We report on the establishment of the PopGen 2.0 Network (P2N), an overarching alliance of initially seven biobanks from Northern Germany which adopted a joint but lean governance structure and use-and-access policy for their samples and data. In addition, the members of P2N have pursued an intense collaboration on ethical, legal and social issues and maintain a common IT infrastructure. The implementation of P2N has substantially improved the prospects of biobank-based research at the participating institutions. The network may thus serve as a role model for similar initiatives geared at linking pre-existing biorepositories for the benefit of research quality, efficiency, and transparency [1)].

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A biobank of patient-derived glioma organoids is a valuable resource for cancer research, particularly for studying gliomas, which are aggressive brain tumors. Glioma organoids are 3D cell cultures derived from patients' tumor cells, closely mimicking the tumor's native environment, including its heterogeneity and interaction with the surrounding microenvironment. These organoids offer a more accurate model for studying tumor biology, drug responses, and personalized medicine approaches.

Key Aspects of a Glioma Organoid Biobank: Patient-Derived: Tumor samples are obtained from patients during surgeries or biopsies, ensuring that the organoids represent the diversity of glioma subtypes and stages.

3D Culture Systems: The organoids are grown in 3D conditions, which better recapitulate the complex architecture of gliomas, compared to traditional 2D cultures.

Genetic and Molecular Fidelity: Glioma organoids maintain key genetic mutations, molecular signatures, and phenotypic features of the original tumors. This makes them useful for studying disease mechanisms at a patient-specific level.

Applications:

Drug Screening: Researchers can test various therapies on these organoids to predict how a patient's tumor might respond, leading to more personalized treatment strategies. Mechanistic Studies: Organoids can be used to study the molecular and cellular mechanisms of glioma progression, invasion, and resistance to therapy. Preclinical Models: Glioma organoids serve as models for validating potential drug candidates before clinical trials. Personalized Medicine: Because these organoids are patient-specific, they allow for the testing of individualized treatment plans, helping to tailor therapies to a patient's unique tumor characteristics.

Cryopreservation and Accessibility: Organoids can be cryopreserved and stored in the biobank for future research, making them a renewable resource. A biobank ensures standardized access to well-characterized glioma models for academic and clinical research teams.

This type of biobank is a crucial tool in advancing glioma research and improving treatment outcomes [2]

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[2]
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