

Biobanking is one of the most valuable tools in precision medicine. The ability of scientists to sequence tumors, blood, and normal tissue obtained from biorepositories has defined efficacious tumor targeting and a much better understanding of cancer pathology pathways. However, these biorepositories require a great deal of effort to establish and maintain. Oncology nurses are key in helping to bank tissue during routine procedures as well as complex surgeries. Nurses can obtain informed consent from patients and coordinate the banking of samples in a timely manner to ensure sample quality. Oncology nurses play an important role in informing patients of their biobanking options and connecting patients with the appropriate team for their biobanking needs.

AT A GLANCE

- Tissue from both healthy and malignant sites can help to better characterize metastatic cancer spread, increasing understanding of cancer pathophysiology.
- Obtaining this tissue in adequate amounts can be done during surgeries, biopsies, and even after death if agreement is reached with the patient and family.
- The process by which patients and families consent and participate, coordination of the tissue donation, and cooperation of clinical staff is complex and well suited to the oncology nurse's skill set.

KEYWORDS

biobanking; genetic sequencing; informed consent; rapid autopsy; precision medicine

DIGITAL OBJECT

IDENTIFIER

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Biobanking

How oncology nurses can contribute to its use

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In the age of translational cancer research and precision medicine, individualized cancer treatments are evolving rapidly (Krzyszczuk et al., 2018). This is, in part, because of increasingly sophisticated genomic sequencing capabilities that allow for more precise and efficacious tumor targeting and an enhanced understanding of cancer pathology. Tissue, body fluid, and blood collection have become paramount for cancer research. Analysis of these tissues allows for better characterization of the patient's tumor and for creation of a repository of tissue to better understand specific tumor types, the progression and metastasis of cancer, and tumor response to various treatments (Ghagane & Nerli, 2020).

Cancer treatment is often directed by the molecular tumor subtype; as such, it is particularly important to define and track this heterogeneous disease at the cellular level. This is often only possible through tissue analysis. The need for consistent tumor samples from patients with cancer who have undergone certain treatments, possess certain genetic alterations, or perhaps have a family history of disease requires many samples from many cohorts of patients to be collected, deidentified, stored, and carefully organized (Suh et al., 2013). The collection and organization of this pool of samples would not be possible without biobanking (Patil et al., 2018).

Biospecimens include any tissue or fluid from which nucleic acid can be extracted for sequencing or animal injection (known as xenografts), or to make slides for staining. These specimens may include solid tissue, blood, bone marrow, urine,

hair, saliva, or other body fluid (such as ascitic or pleural fluid). Formalin-fixed, paraffin-embedded (FFPE) tissue generated by a pathology team during a routine clinical procedure is also a valuable resource (Donczo & Guttman, 2018). FFPE tissue can be stored for years at room temperature and has become an acceptable preservation method for sequencing, which makes it even more valuable than previously believed. Biorepositories can store FFPE tissue from clinical procedures performed on both healthy and sick patients. Archiving normal FFPE tissue will allow for comparison of a large number of specimens that include normal control samples (Donczo & Guttman, 2018).

Maintaining a biorepository involves obtaining patient consent, coordinating the collection of samples generated for research in concert with a needed clinical sample (a necessity of some institutional research boards), and having samples retrieved from clinics and operating rooms and deidentified for banking (Lee, Lee, et al., 2019).

Informed Consent

Biospecimens can be obtained for research purposes following the receipt of patient informed consent, in which they agree to be a tissue donor. A systematic review of patient understanding of tissue banking by Eisenhauer et al. (2019) found that this process of obtaining consent is often associated with lack of trust, little consideration of patient values, limited patient understanding, and limited time. These challenges may be, in part, because of components of biobanking that increase the complexity of the consent process.