

Biological Principles Of Tissue Banking

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The US Navy Tissue Bank: 50 years on the cutting edge

D. Michael Strong
Northwest Tissue Center/Puget Sound Blood Center, 921 Terry Avenue, Seattle, WA 98104, USA
(Tel.: 206-292-1889; Fax: 206-292-8030; e-mail: dmstrong@psbc.org)

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Abstract

The US Navy Tissue Bank was established in 1949 by Dr. George Hyatt, an orthopaedic surgeon at the Naval Medical Center in Bethesda, Maryland. The Navy program was the first of its kind in the world and established many of the standards that are followed today. During the 1950s, the identification of appropriate donor criteria for tissue donation, the development of procurement and processing methods, the establishment of a graft registry and documentation and the clinical evaluation of a variety of tissues were pioneered at this facility. Cryopreservation, freeze-drying, irradiation sterilization of tissue, as well as immunological principles of tissue transplantation, were developed during the 50 years of research and development by Navy scientists. Organ preservation, cadaveric bone marrow recovery and immunosuppressive protocols were also developed at the Navy Tissue Bank. The Navy was also instrumental in the establishment of the National Marrow Donor Program and the American Association of Tissue Banks in the US.

Although the Navy Tissue Bank has ceased activity after 50 years of excellence, it should be recognized as the first standard setter for the world community of tissue banks.

The United States Navy Tissue Bank has generally been accepted as the first full service tissue bank of its kind in the world. This year, 1999, represents the 50th anniversary of its inception. It was established in 1949 by Dr. G.W. Hyatt, who conceived of the idea during a year's fellowship at the Navy's Lahey Clinic (Hyatt 1949). The concept of a bone bank had gained attention at that time as a result of the work of Bush & Garber (1948), and Wilson (Wilson 1947). The attending staff at the clinic were intrigued. In 1949, Dr. Hyatt returned to the orthopaedic service of the Naval Hospital in Bethesda, Maryland, and convinced the department chairman to purchase a small freezer for storing surplus bone collected from orthopaedic surgical cases (Figure 1). It soon became evident that a four cubic foot freezer could not adequately store sufficient bone for all of the cases needing bone grafts. Late in 1949, the Naval Medical School, the Naval Medical Research Institute, and the Naval Hospital of the National Naval Medical Center, formulated a joint project to investigate methods for meeting these needs.

Bone banking entailed not only expensive equipment but also trained personnel. On 29 November,

1949, Rear Admiral M.D. Willcutts, then Commanding Officer of the National Naval Medical Center, established a bone bank as a specialty activity of the Medical School, and made provisions for the beginning of the first tissue bank technician course in the Navy. This provided a center for the procurement, processing, storage and shipment of tissues to all medical facilities in the Navy as well as an opportunity to conduct a clinical investigation to determine the place of bone allografts in surgery. As Director of this new bank, Dr. Hyatt pursued several concepts that formed the foundation of tissue banking today.

Hyatt realized that shipment of bone stored by freezing was difficult because of the need to maintain allografts in a frozen state during the shipping process. His experience with freeze-dried plasma during World War II led him to collaborate with Dr. Florsdorf who had been instrumental in the establishment of large scale production freeze-dryers for freeze-drying of plasma (Florsdorf et al. 1946). This collaboration led to the first publications describing the use of freeze-drying for the preservation of bone grafts (Florsdorf & Hyatt 1952).

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of Biological Genetic Research samples are free of charge in principle, but frozen tubes are used.

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