

The Resource employs the many tools of molecular cytogenetics. The most basic of these tools, and the cornerstone of the Resource's portfolio of proprietary technology, is a method generally known as "chromosome painting," which uses a technique referred to as fluorescence in situ hybridization or FISH. This technology was invented by LBNL Resource leaders Joe Gray and Dan Pinkel.

A technology to emerge recently from the Resource is known as "Quantitative DNA Fiber Mapping (QDFM)." High-resolution human genome maps in a form suitable for DNA sequencing traditionally have been constructed by various methods of fingerprinting, hybridization, and

identification of overlapping STSs. However, these techniques do not readily yield information about sequence orientation, the extent of overlap of these elements, or the size of gaps in the map. Ulli Weier of the Resource developed the QDFM method of physical map assembly that enables the mapping of cloned DNA directly onto linear, fully extended DNA molecules. QDFM allows unambiguous assembly of critical elements leading to high-resolution physical maps. This task now can be accomplished in less than 2 days, as compared with weeks by conventional methods. QDFM also enables detection and characterization of gaps in existing physical maps—a crucial step toward completing a definitive human genome map.