

Core C: Histomorphometry and Molecular Analyses Core

The Histomorphometry and Molecular Analysis Core Laboratory of the UAB CCBSR provides individual Center investigators access to routine and advanced technical preparations including morphological analysis of cell, tissue, and organ preparations that are too complex for individual projects to support efficiently. The Core provides, at no cost to Pilot and Feasibility study investigators, diagnostic light microscopic evaluation, epifluorescent microscopy of undecalcified sections, and immunocytochemical interpretation of animal and human material. In addition, technologically advanced expert assistance in a broad range of methods, including quantitative RT-PCR and tissue in-situ hybridization are available. Investigators utilizing animal necropsies also have access to sophisticated techniques, such as transmission electron microscopy and image analysis/morphometry, usually available only for human pathology as a fee-for-service. Facilities available include histology (special stains, frozen, paraffin- and plastic-embedded sections), immunohistochemistry, and flow cytometry. Importantly, this Core also has the capacity to detect and quantitate vector sequences and specific endogenous gene products within tissues as well as serve as a platform for microdissection for the analysis of cells. The Core centrally purchases supplies, resulting in a substantial economy of scale. Core services include quality control and written reports for tests performed. A key advantage of the Core design is that it enables unified characterization and dissemination of a shared set of histomorphometric standards. This activity thus provides investigators with immediate access to defined and quality assured data for their respective studies, as well as allowing comparison of results between investigators with assurance that technical preparatory conditions are not responsible for observed differences. Furthermore, centrally performed procedures free investigators from duplication of basic work, allowing more production with the available resources and acceleration of experimental timetables. During the first 4 years of the Core's existence the Core Laboratory has acquired \$150,000 in new instrumentation, generated new technical services such as *in situ* hybridization on bone. In addition to making available a wide array of techniques, the Core provides extensive education, including discussion of the advantages, limitations, and interpretation of each approach. It has supported a total of 151 projects resulting in 45 publications. All of the Pilot and Feasibility Project Investigators made use of the Core. It has enhanced the productivity of the CCBSR investigators and contributed to innovative, interdisciplinary basic bone biology research most especially in the fields of implant biology and gene therapy. This core works in close collaboration with the other CCBSR cores and several investigators make use of all three cores in their ongoing studies.