CENTER FOR SARCOMA AND BONE ONCOLOGY

OSTEOSARCOMA

RESEARCH DESCRIPTION

Dana-Farber is advancing osteosarcoma research and care with investigations led by Katherine Janeway, MD, a pediatric hematologist-oncologist and vice-chair for the Bone Tumor Committee of the Children's Oncology Group, a clinical trials group supported by the National Cancer Institute. Recently, Dr. Janeway collaborated with the Broad Institute and Beth Israel Deaconess Medical Center on a study that showed how microRNAs – a class of molecular regulators – are predictors of poor survival in osteosarcoma.

For the study, results of which were published in the journal *Genome Medicine* in January 2013, Dr. Janeway examined tumor samples from 65 patients who were treated at Dana-Farber in the last 25 years. Analysis of archived bone tumor tissue is challenging, and Dr. Janeway's success with a new technique to manipulate the tissue was unprecedented. The discovery that a specific microRNA can serve as a prognostic measurement to determine the intensity of treatment for osteosarcoma patients could greatly advance clinical practice.

In a separate collaboration with Stuart Orkin, MD, chair of Dana'-Farber's Department of Pediatric Oncology, and investigators at the Broad Institute, Dr. Janeway has identified a crucial survival pathway for osteosarcoma. Dr. Janeway and her colleagues used next-generation genomic sequencing, combined with a technique to systematically block the function of each gene in the genome, and observed the effects. This study provided the strongest evidence to date implicating this pathway in osteosarcoma. Using a mouse model originally developed at Dana-Farber four years ago, Dr. Janeway validated this discovery with drug studies, as there are drugs already available that target this pathway in other types of cancer. Dr. Janeway's findings could accelerate the development of this class of therapeutics, thus yielding one of the most significant advances in osteosarcoma treatment in the last 30 years.