CHILDREN'S ONCOLOGY GROUP

The world's childhood cancer experts

What would Willie want

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QuadW and COG Collaborate to Put Tissues in the Hands of Researchers

Osteosarcoma (OS) is the most common malignant bone tumor diagnosed in children, with nearly 400 children and adolescents newly diagnosed each year in the US. Unfortunately, treatment and survival rates have not significantly improved over the last 30 years. Further exploration into the biology of osteosarcoma, and specifically metastasis, is needed to improve therapeutics and the survival of patients.

In 2007, following the death of Willie Tichenor from osteosarcoma, a panel of expert sarcoma researchers convened on behalf of the WWWW Foundation (QuadW). This group proposed dramatically enhancing the utility of the Children's Oncology Group (COG) osteosarcoma tissue bank by performing quality assessments of existing samples, gathering overdue clinical result annotation for each sample, and providing biostatistical support for researchers using the tissues. With a shared mission to support OS biology research, QuadW and COG created the Osteosarcoma Biostatistics and Annotation Office (OBAO) in 2008. At its inception, the OBAO set out to improve the value of the nearly 15,000 OS biospecimens collected at the Biopathology Center (BPC) at Nationwide Children's Hospital by linking these specimens to patient clinical information and outcomes (i.e. seeking to develop a fully clinically annotated biospecimen repository). These linkages are an important first step in conducting the type of research that looks at underlying biological processes and treatment mechanisms. At the onset of this work, only 5.3% of patients from the OS biology study P9851 were attached to outcome data. As of 2016, more than 90% of these samples have accompanying outcome data and are available for use in meaningful clinical research and analyses.

Because the project was successful, other sarcoma groups within COG petitioned us to expand our support beyond osteosarcoma. Accordingly, in 2011, the OBAO expanded its scope to include Ewing sarcoma (ES) and soft tissue sarcomas (STS) and was renamed the Childhood Sarcoma Biostatistics and Annotation Office (CSBAO). The CSBAO has worked to update outcome data for the legacy ES biology protocol AEWS02B1 in a similar manner to P9851, and updated and cleaned data from current banking protocols AOST06B1 (OS), AEWS07B1 (ES), and D9902 (STS). The result is high-quality data linked to banked specimens for use in research across childhood sarcomas.

The CSBAO also provides statistical support to investigators across the country and internationally. Since the inception of this work, the number of project requests to the COG in childhood sarcomas has rapidly expanded to 72 project requests since 2007 and led to the completion and 27 research publications.

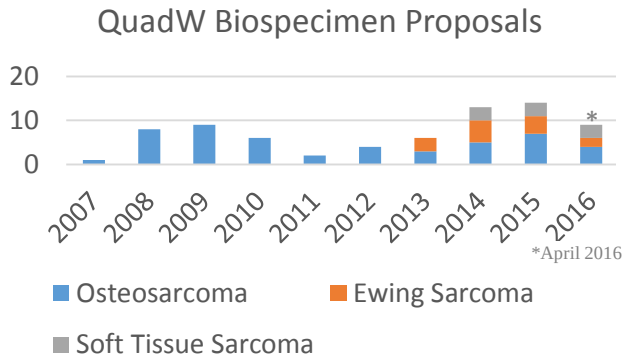

Figure 1. Timeline of the 72 biology projects proposed to COG-QuadW collaboration in childhood sarcomas growing over time

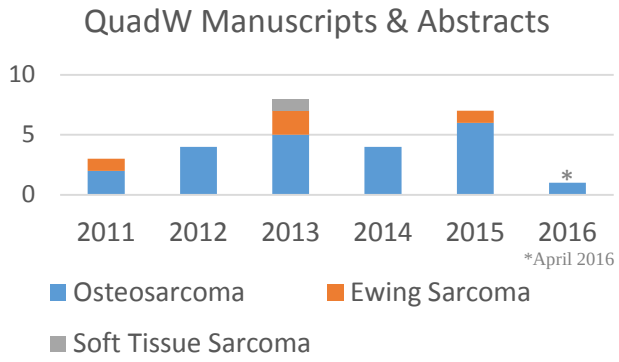

Figure 2. Timeline of biology projects published with efforts from the COG-QuadW CSBAO expanding since 2011

Highlights of these projects include large-scale gene expression assays in the NCI-led Therapeutically Applicable Research to Generate Effective Treatments (TARGET) program and Strategic Partnering to Evaluate Cancer Signatures (SPECS) studies, as well as the first genome-wide association studies in osteosarcoma.

A High Dimensional Database (HDD) is now available for qualified investigators to store research results and conduct *in silico* studies across projects. The ability to answer scientific questions within an existing database rather than through new biospecimen requests helps to avoid tissue resource depletion and decreases research costs.

In 2014, CSBAO further expanded its scope to include collection of relapsed tissues, as metastatic disease is deadly for sarcoma patients.

These combined efforts put forth by the QuadW, COG and the CSBAO serve as a model for all of the different disease groups within COG. This model demonstrates the importance of clinically linked data and encouraging investigators push forward their research and results to further the understanding of childhood sarcoma biology and improve survival.