

AAO Foundation Award Final Report

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Secondary Investigators	
Award Type	Biomedical Research Award
Project Title	Imaging and Biological Markers of TMJ Osteoarthritis
Project Year	2012-2013
Institution	University of Michigan
Summary/Abstract (250 word maximum)	<p>Aim: (1) To investigate 3D morphological variations and local and systemic biomarker profiles in TMJ Osteoarthritis (TMJ OA) subjects, as compared to age and gender matched controls. (2) To integrate morphological and biomarker findings to produce a model of TMJ OA.</p> <p>Methods: Twelve OA and Twelve controls underwent a comprehensive exam by an oral and maxillofacial pain specialist and had Cone beam CT (CBCT) scans taken and synovial fluid and blood withdrawn. 3D models of the condyles for each control and OA subject were constructed from the CBCTs. Protein microarrays (RayBiotech) were used to analyze synovial fluid and plasma samples for the levels of fifty biomarkers known to have a role in OA or the inflammatory process. Shape Analysis MANCOVA was used to look for statistical correlations between biomarker levels and variations in surface morphology of the TMJ OA subjects.</p> <p>Results: The average OA model demonstrated an overall smaller condylar size with areas of statistically significant difference localized to the lateral and medial poles as well as the superior surface. Levels of ANG, GDF15, TIMP-1, CXCL16, MMP-3 and MMP-7 cytokines presented interactions with the bone apposition of the anterior surface of the condyles. Levels of 6ckine, ENA-78, TIMP-1, CXCL16, MMP-3, PAI-1, VE-Cadherin, VEGF, MIP-1,</p>

	<p>EGF, GM-CSF, TGFb1, IFNg, TNFa, IL-1a, IL-6 and BDNF cytokines presented interactions with bone resorption and flattening reshaping of the lateral pole of the condyle.</p> <p>Conclusions: Shape Analysis MANCOVA correlated variations in biomarker levels with variations in surface morphology for the OA and control groups.</p>
<p>Were the original, specific aims of the proposal realized?</p>	<p>Yes.</p>
<p>Were the results published? If not, are there plans to publish? If not, why not?</p>	<p>Yes. The first paper has been submitted to DMFR and 2 other papers are in preparation for submission.:</p> <p>Schilling et al. Regional 3D Superimposition to Assess Temporomandibular Joint Condylar morphology. Submitted to DMFR, July 2013</p> <p>Cevidanes et al. Image Analysis Classification of Condylar Morphology. To be submitted to Bone.</p> <p>Cevidanes et al. Integration of Imaging and Biological Markers of TMJ arthritis. To be submitted to Bone.</p>
<p>Have the results of this proposal been presented? If so, when and where? If not, are there plans to do so? If not, why not?</p>	<p>Yes, the results were presented at the IADR 2013 meeting in Seattle and will be presented at the 2014 AADR in Charlotte, NC and the 2014 AAO in New Orleans.</p>
<p>To what extent have you used, or how do you intend to use, AAOF funding to further your career?</p>	<p>The AAOF award has provided broad and exciting new frontiers for translational research in the field of TMJ health and disease. This Biomedical Research Award will lead to continued investigations to better understand bone repair and remodeling in the TMJ.</p>