

## AAO Foundation Award Final Report

Principal Investigator	Sean Shih-Yao Liu
Co-Investigator	Kelton Stewart
Secondary Investigators	Katherine Kula Jie Chen Thomas Katona
Award Type	Orthodontic Faculty Development Fellowship Award
Project Title	A Novel 3D Superimposing Technology to Evaluate Mandibular Growth
Project Year	July 2010-June 2011
Institution	Indiana University School of Dentistry
Summary/Abstract (250 word maximum)	To develop an ideal approach to correct mandibular deficiency in growing individuals, <i>our objective of this study</i> was to establish a valid method of evaluating condylar growth. We have pursued <i>two specific aims</i> : 1) Establish a means to measuring 3D morphological changes of the condyle; 2) Obtain pilot data for developing a larger study comparing treatment effectiveness of the traditional Herbst appliance and MARA. The <i>central hypothesis</i> of this study was that the MARA guides greater mandibular advancement and condylar growth with lesser dental movement, compared to the Herbst appliance. The first aim has been accomplished by developing a novel superimposition technology of 3D cone-beam computerized tomography (CBCT) in 3 cases using Iterative Closet Point technique. Dental and skeletal landmark movement and condylar growth were quantified and represented in 3D coordinate and color mapping systems. Under the second aim, 14 patients were recruited and randomly allocated into two groups, treated with the Herbst and MARA, respectively. This prospective study is <i>innovative</i> because it creates a new approach to understanding craniofacial growth and evaluates effects of orthopedic growth modification while also investigating new treatment approaches for correcting mandibular deficiency. The research is <i>significant</i> because it provides a new evidenced-based approach to assess growth and treatment outcomes in a 3D manner.
Were the original, specific aims of the proposal realized?	Yes
Were the results published? If not, are there plans to publish?	No, the manuscript under the first aim is in preparation for submitting to the American Journal of Orthodontics and Dentofacial Orthopedics

If not, why not?	
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?	Yes, it was presented in IADR 89th General Session and Exhibition 2011 San Diego, CA