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**AAO Foundation Final Report Form
(a/o 5/31/2016)**

Date: June 12, 2017

Type of Award: Center Award

Name(s) of Principal Investigator(s): Jeff Nickel

Co-Investigators: David Covell, Laura Iwasaki, Sylvia Frazier-Bowers, Saran Huja, Sunil Kapila

Title of Project: *Consortium for Orthodontic Advances in Science and Technology (COAST):
Innovators' Workshops on "Personalized and Precision Orthodontic Therapy",*

Period of AAOF Support: July 1, 2014 to June 30, 2017

Amount of Funding: \$75,000

Summary/Abstract of Completed Project (250 word maximum)

Objectives: The COAST 2014 and 2016 Workshops goals were: 1) foster collaborative interactions among clinicians, educators, and researchers, 2) to develop a position paper establishing standards for the profession on how to use personalized and precision orthodontics in clinical practice, 3) to develop technology transfer plan, and 4) to produce a peer-reviewed proceedings based the information derived from the workshops.

Methods: Participants of the Consortium for Orthodontic Advances in Science and Technology (COAST) 2014 and 2016 Innovators' Workshops met at the Eaglewood Resort and Spa, Itasca, Illinois, September 11-14, 2014; and West Palm Beach Marriott Hotel, September 9th-11th, 2016.

Results: The role of gene-environment interactions, to explain complex craniofacial traits, was the focus of several sessions. It was agreed that there was the need for diverse approaches such as (i) large-scale collaborative efforts for future genetic studies of complex traits such as malocclusion; (ii) deep genome sequencing to address the issues of isolated unilateral mutations; (iii) quantifying epigenetic-environmental variables in diverse areas such as chronic myofascial

pain, alveolar remodeling during tooth movement, and mandibular condylar growth. Also, there was the need for multi-scale/multi-species modeling and experimentation, with enhanced emphasis on controlled mechanics, for inter-species translation of results about bone biology. Finally, discussions amongst panelists facilitated a consensus that there was a need for a consortium approach to establish standards for intra-oral scanning and 3D imaging.

Conclusions: Current and emerging technologies still required supported research to translate new findings to the orthodontic clinic.



Response to the required questions are as follows:

1. Were the original, specific aims of the proposal realized?

Yes, the COAST 2014 and 2016 Innovators' Workshops met at the Eaglewood Resort and Spa, Itasca, Illinois, September 11-14, 2014; and West Palm Beach Marriott Hotel, September 9th-11th, 2016. At each workshop, approximately 65 registered attendees heard presentations from approximately 27-34 speakers, 8-15 poster presenters, and 4 lunch-hour focus groups. The Innovators' workshops were organized according to five themed sessions. Each session was concluded by a panel discussion. The aims of the discussion sessions were to identify: i) the strengths of evidence of discoveries, ii) the required steps to enable further development, iii) the steps required to implement new findings into orthodontic practice. Prefaces to the journal publications produced by the two workshops described outcomes for establishing standards for the profession on how to use personalized and precision orthodontics in clinical practice, as well as a technology transfer plan.

2. Were the results published?

a.) If so, was AAOF support acknowledged?

b.) If not, are there plans to publish? If not, why not and will AAOF support be acknowledged?

Yes, two special issues of Orthodontics and Craniofacial Research published a collection of

53 manuscripts, which were submitted by presenters at the two workshops. AAOF is acknowledged in these special issues of the journal. The special issues are:

1. Orthodontics and Craniofacial Research, COAST 2014 Innovators Workshop, Volume 18, Issue S1, April, 2015
2. Orthodontics and Craniofacial Research, COAST 2016 Innovators Workshop, in press

Prefaces to each special issue were produced by the COAST Scientific Advisory Board addressed specific aims 2 and 3 which were: Specific Aim 2, to develop a position paper establishing standards for the profession on how to use personalized and precision orthodontics in clinical practice; and Specific Aim 3, to develop technology transfer plan

3. Have the results of this proposal been presented?
 - a.) If so, when and where? Was AAOF support acknowledged?
 - b.) If not, are there plans to do so? If not, why not and will AAOF support be acknowledged?

Yes, the COAST 2014 and 2016 Innovators' Workshops met at the Eaglewood Resort and Spa, Itasca, Illinois, September 11-14, 2014; and West Palm Beach Marriott Hotel, September 9th-11th, 2016. At each workshop, approximately 27-34 speakers made presentations, with an addition of 8-15 poster presenters, and 4 lunch-hour focus groups. AAOF was acknowledged as a major contributor to the workshops

4. To what extent have you used, or how do you intend to use, AAOF funding to further your career?

A secondary goal of the 2014 and 2016 Workshops' was to showcase the research work of young investigators who have been sponsored by the AAOF. It is the intent of the COAST Scientific Advisory Board to continue this endeavor by making an application for AAOF funding for 2018 and 2020 Innovators' Workshops.

Accounting for Project, i.e., any left-over funds, etc.

All funds spent from this award have been in accord to the approved budget and with the oversight of the UMKC School of Dentistry Research Office. There remaining balance as of 6-13-17 is \$4,387. The publication costs of the 2016 proceedings was less than expected and was the reason for the remaining monies.

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