

AAO Foundation Award Final Report

Principal Investigator	Dr. Maria Orellana
Co-Investigator	N/A
Secondary Investigators	N/A
Award Type	Orthodontic Faculty Development Fellowship Award
Project Title	Characterization of Dental Enamel Surface Before and After Etching
Project Year	2008-2009
Institution	UCSF
Summary/Abstract (250 word maximum)	<p>Objective: The objectives of this study were two-fold: 1) To quantitatively characterize human enamel porosity and surface area in vitro before and after etching for variable etching times and 2) To evaluate shear strength after variable etching times. Specifically, our goal is to identify the presence of any correlation between enamel porosity and shear strength.</p> <p>Method: Surface area of enamel from 15 sound premolars were analyzed by Multipoint Brunnauer, Emmett and Teller (BET) nitrogen adsorption prior to and after etching for 15, 30 and 60 seconds. Pore size and pore volume were calculated using the Barrett-Joyner-Halenda (BJH) method. All measurements were done on the same samples before and after 15, 30 and 60 seconds of etching with 37% phosphoric acid. Orthodontic brackets were bonded with Transbond™ to the samples with variable etch times and were subsequently applied to the Single Plane Lap Shear Testing System to evaluate shear bond strength.</p> <p>Result: Statistically significant differences were found in total surface area, pore size and pore volume amongst the different sample groups with variable etch times. A weak correlation was found between variable etching times and shear strength.</p> <p>Conclusion: The significance of this research is that defining the porous enamel structure is central to improving acid-etching protocols. We anticipate that this research will lead to a better understanding of both dental enamel and the effects of acid etching.</p>
Were the original, specific aims of the proposal realized?	Yes

Were the results published? If not, are there plans to publish? If not, why not?	The results have not been published yet. We are in the process of submitting the first of two papers we are planning to publish.
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: IADR meeting, Miami 2009 AAO meeting, Boston 2009 EOS meeting, Helsinki, 2009