Author's response to reviews

**Title:** Effect of microsilver and nanosilver particle addition to the primer of an orthodontic adhesive on Enamel Shear Bond Strength (SBS)

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**Author's response to reviews:** see over
Dear Dr. Borzabadi-Farahani

Thank you for the reviews on our manuscript MS: 1382848551395318, “Effect of microsilver and nanosilver particle addition to the primer of an orthodontic adhesive on Enamel Shear Bond Strength (SBS).”

Please find attached the responses to the referees.

We included the marked points in the manuscript and loaded the revised version up on your server. With the help of the recommendations of the different reviews the scientific quality of our manuscript has been significantly improved. We would be very honored if the revised paper will now be published in your journal.

Best wishes,

Sonja Blöcher

Point-by-point response to Reviewer 1, Dr. Ali Borzabadi-Farahani

Quality of written English
The paper has been revised by a native speaker.

Statistical review
Prof. Korbmacher-Steiner reviewed the statistics.

Sizes of the microparticles and the nanoparticles
The sizes of the microparticles and the nanoparticles were included in the manuscript.

Section Abstract
Background:
“Antimicrobial particles” was changed to “nanoparticles”

Materials:
The company name, city and country of the Transbond XT’s manufacturer were added in the Methods.

“According to Artun and Bergland, 1984,” and the reference were added.

The “Chi-square values, df values and p values were added in the Results.

Section Background
The different mechanisms that nanoparticles can be used for anti-caries activity were added as well as the reference (Acta Odontol Scand. 2014 Aug;72(6):413-417)

Section Materials and Methods
The chapter name “Methods” was changed to “Materials and Methods”

All materials were written in text in the part “Materials”.

Part bonding procedure:
A Photograph from a bonded tooth in the testing machine was added as Figure 1.
(Old Figure 1 shifted to new Figure 2 and old Figure 2 shifted to new Figure 3.)
The headline “Shear bond strength” was changed to “Shear bond strength measurement”.

The headline “Residual Adhesive” was changed to “Assessment of Residual Adhesive”.

The headline “Color of the teeth” was changed to “Assessment of Color of teeth after debonding”.

Section Results
This section was written in past tense.

The sentence “By eye check no visible silver on the teeth was detected.”, was changed to “By visual eye check no visible silver on the teeth was detected.”

Chi-square values and df values were added.

Section Discussion
Limitations of the in vitro model, the ARI system and the bovine system were added and discussed. The reference (Eur J Orthod. 2012 Oct;34(5):610-617) was cited in the discussion.

Table 1
“Mandibulary” was corrected to “mandibular”
The Rocholl GmbH is a company that offers dental test specimens. The company is officially registered with the veterinary authority for the preparation of bovine teeth. (EU approval code: DE 08 2 25 0001 14). Therefore, we bought the incisors from this company.

The particle sizes of microsilver and nanosilver were added in this table.

**Table 2**
The “Mean” and “sd” were combined as “Mean (sd). The “min” and “max” were combined as “range”. The “95% CI” was added.

**Point-by-point response to Reviewer 2:**

**The embedded text in “Figure 2”**
This text was not embedded in the original figure. We suppose that it was embedded when the figure was up-loaded to BMC Oral Health submission site.

**Vertical lines from the tables should be removed and centered within the table cells.**
The vertical lines were removed. The values were centered within the tables.

**Typographical errors**
Line 120 (new line 149):
“Newtons” was corrected to “Newton”.

Line 178 (new line 208):
“Ammomium” was corrected to “ammonium”.

**Discretionary Revisions**
Figure 1:
Figure 1 was stretched out horizontally.
Part of the legend was incorporated into the graph. The other part of the legend is embedded in the text file.

**Point-by-point response to Reviewer 3**

**Section Abstract**
**Methods**
“(n=16)” was changed to “(n=16/group)”.

For all microsilver and nanosilver groups the weight/weight concentration was added in parentheses.
In line 45 the following was added:
Under stereomicroscopic investigation ARI scores of the different groups were not statistically different.

Section Background
The recommended sentence: “The risk of white spot lesions is significantly less in lingual orthodontics as compared to buccal orthodontics but still present.” As well as the two references (Beyling et al. Head Face Med. 2013 Sep 11;9:27; van der Veen et al., Eur J Oral Sci Jun 1; 118(3):298-303) were embodied in the manuscript.

Beyling et al. Head Face Med. 2013 Sep 11;9:27 was added for a second time on the recommended point.

The sentence “which up to date are an equal problem in both, lingual and buccal orthodontics.” and the reference (Ziebura et al, Am J Orthod Dentofacial Orthop. 2014 May;145(5):649-654) were incorporated.

Section Materials
Specimens and preparation of stock solutions of microsilver and nanosilver

For all microsilver and nanosilver groups the percentages were explained. These percentages were the weight/weight percentages. The ppm values are the number of the particles in the solutions. The correlation between ppm and weight/weight (w/w) was explained.

“Aqua” is the name of the product. The company, city and country were added.

Bonding procedure
“Omcro” was corrected to “Ormco”.

“… from mesial to distal side.” was corrected to “…from the mesial and distal side.”

“The bonding procedure was performed according to the manufacturer’s instructions.” This sentence was changed to: “The bonding procedure was performed by one investigator (SB) according to the manufacturer’s instructions.”

A sentence that describes the base of the discovery brackets was included. In the Discussion section it was discussed.

Assessment of Residual Adhesive
Question:
“Could have happened, that the excessive bonding material has not been removed meticulously on all specimens, so it would have been more precise to measure the respective bonding surface prior to applying the force on the bracket.”

Response:
We removed the excessive bonding material so meticulously as possible. Therefore, we did not measure the respective bonding surface prior to applying the force on the bracket. The value of the surface area of the brackets was given from the manufacturer.

The investigator was not blinded during the analysis of the ARI score. It is discussed in the Discussion that this score is quite subjective.

The abbreviation SEM was explained. The sentence is now:
“For scanning electron microscope analysis (SEM) the samples were ...”

Statistical analysis
The word “the” was integrated in the text, where the referee marked it.

Results
The word “the” was integrated in the text, where the referee marked it.

The word “a” was integrated in the first sentence:
“The Kolmogorov-Smirnov test for SBS showed a normal distribution of all experimental groups (Statistic = 0.045, df = 96, p = 0.200).”

The acronym “REM” was corrected to “SEM”.

Discussion
The following points were discussed and integrated in the revised text:
- Explanation why we used bovine teeth instead of human teeth
- References dealing with the differences of human and bovine teeth
- Possible consequences if microsilver or nanosilver were used on human teeth in a clinical setting

References
The reference section was corrected. All mistakes were corrected and the additional references were added.

Figure legends
Figure 2 (Changed to Figure 3 in the revised version)
“REM” was corrected to “SEM”.

The following sentence was explained:
Silver spots on Transbond XT plus 0.1% (w/w) microsilver (C) cannot be shown, because the only sample with one silver spot cannot be shown on SEM due to technical complications.

Table 2
The headline was corrected into:
Descriptive statistics of the groups and comparison of SBS values (ANOVA).

It was explained that we used the mean value, because the Kolgomorov-Smirnov test showed normal distribution. Additionally, we incorporated the median into this table.

The abbreviations were explained (n, MPa, F, p).

Table 3
It was explained that we used the median, because the Kolgomorov-Smirnov test showed no normal distribution.

Figure 1
Figure 1 (now Figure 2) was spread horizontally and the legend was incorporated.