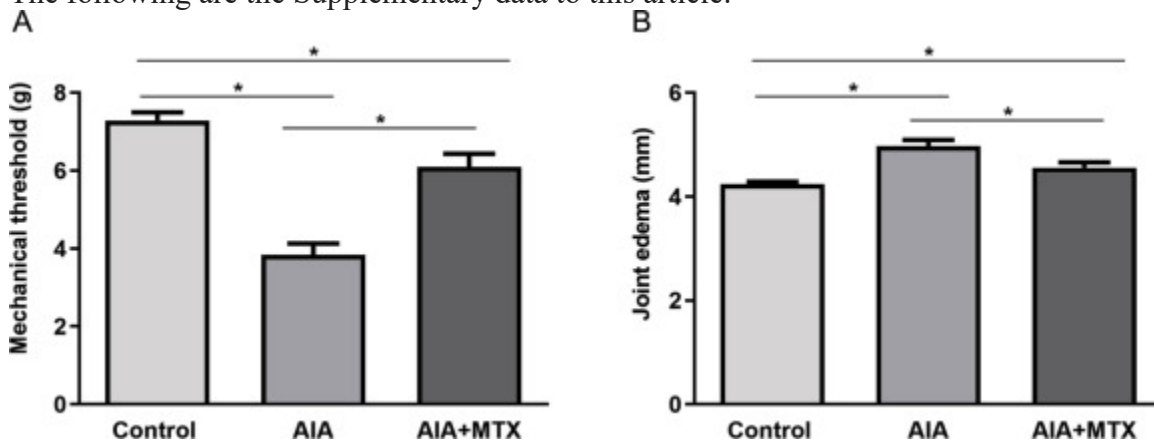


## Appendix A. Supplementary data

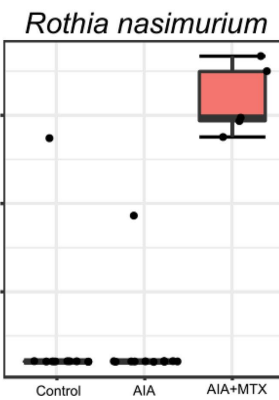
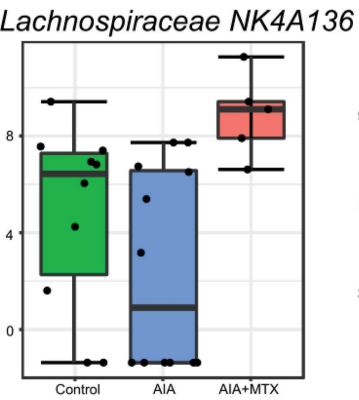
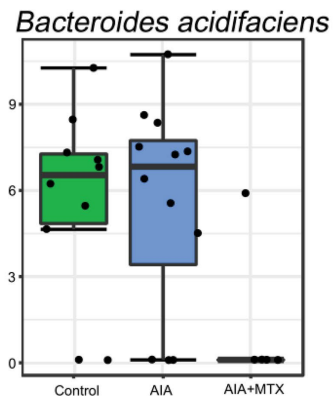
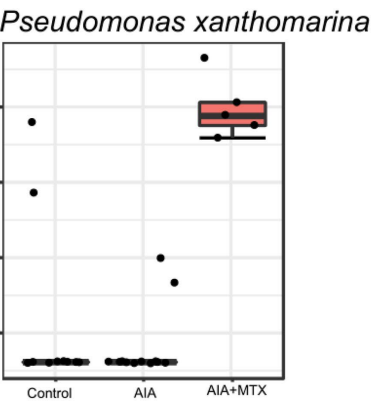
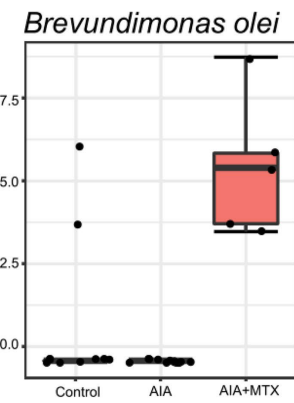
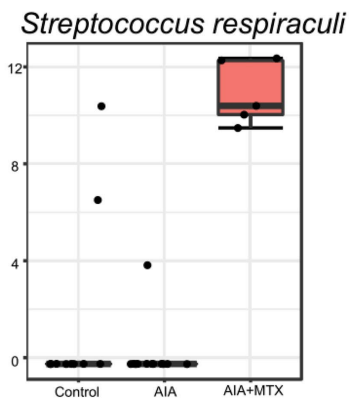
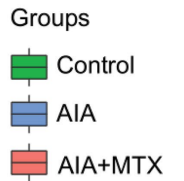
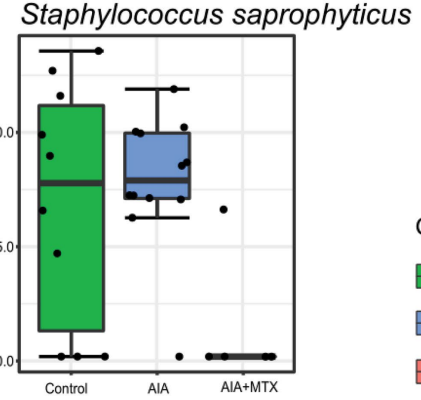
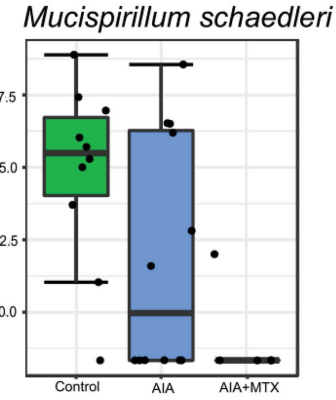
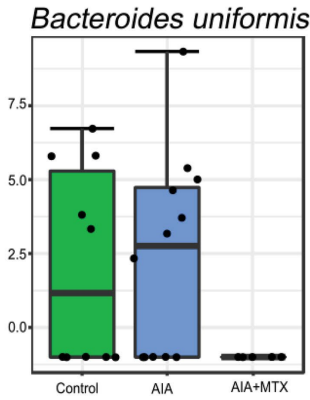
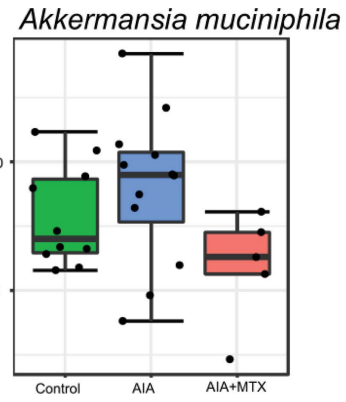
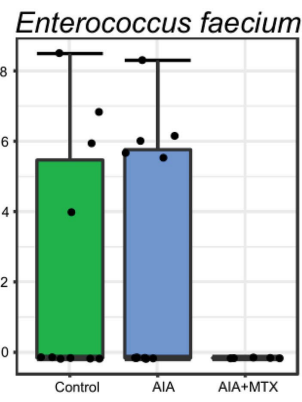
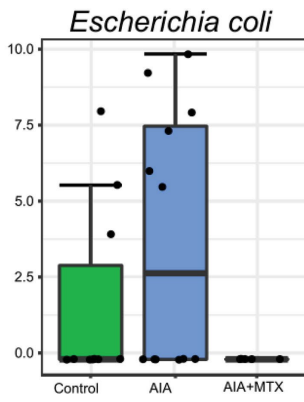
The following are the Supplementary data to this article:



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Supplementary Figure 1. The graph shows the quantification of articular hyperalgesia of the femur-tibial joint (A) and the thickness of the knee joint in millimetres (B) measured 24 h after the last challenge in control mice, mice with antigen-induced arthritis (AIA), and AIA mice treated with methotrexate (MTX). Note: n = 5 animals per group; one-way ANOVA;  $p < 0.05$ .

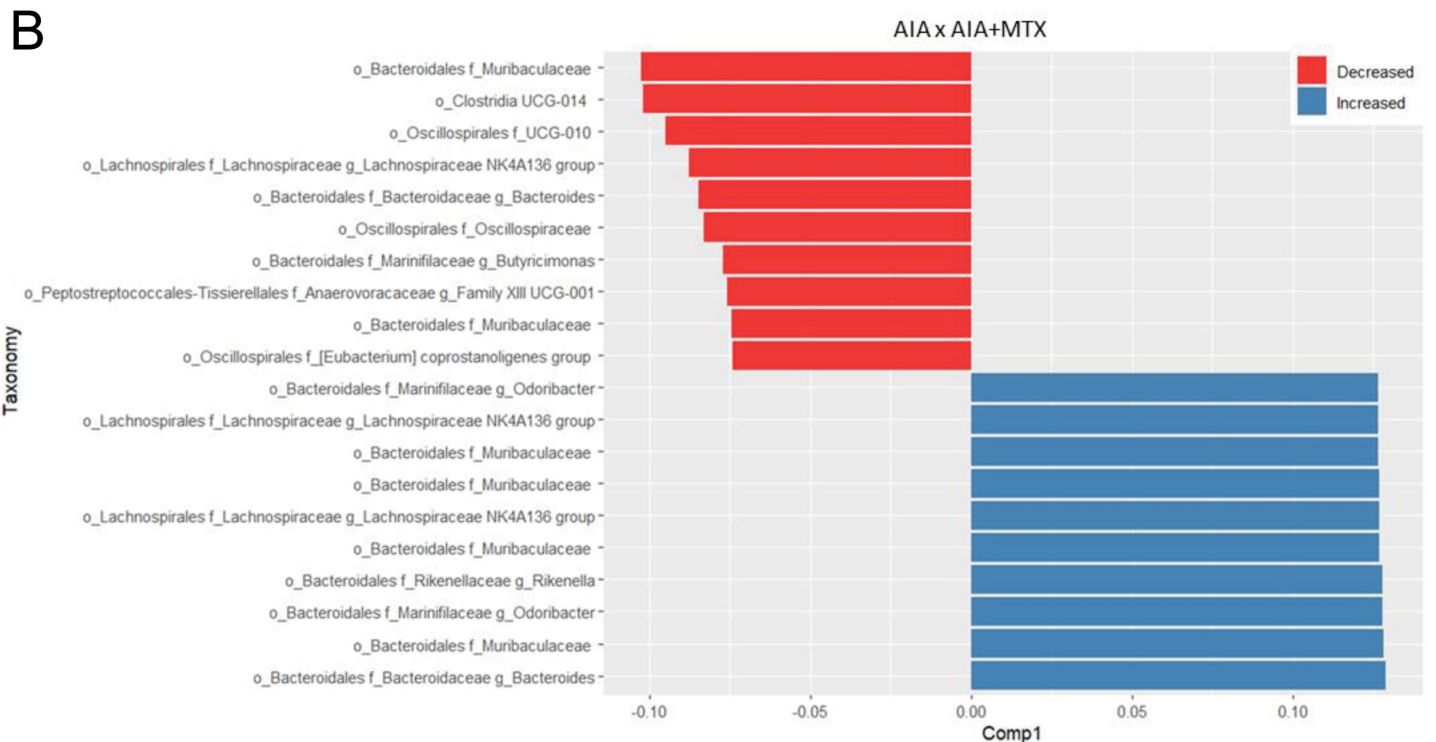
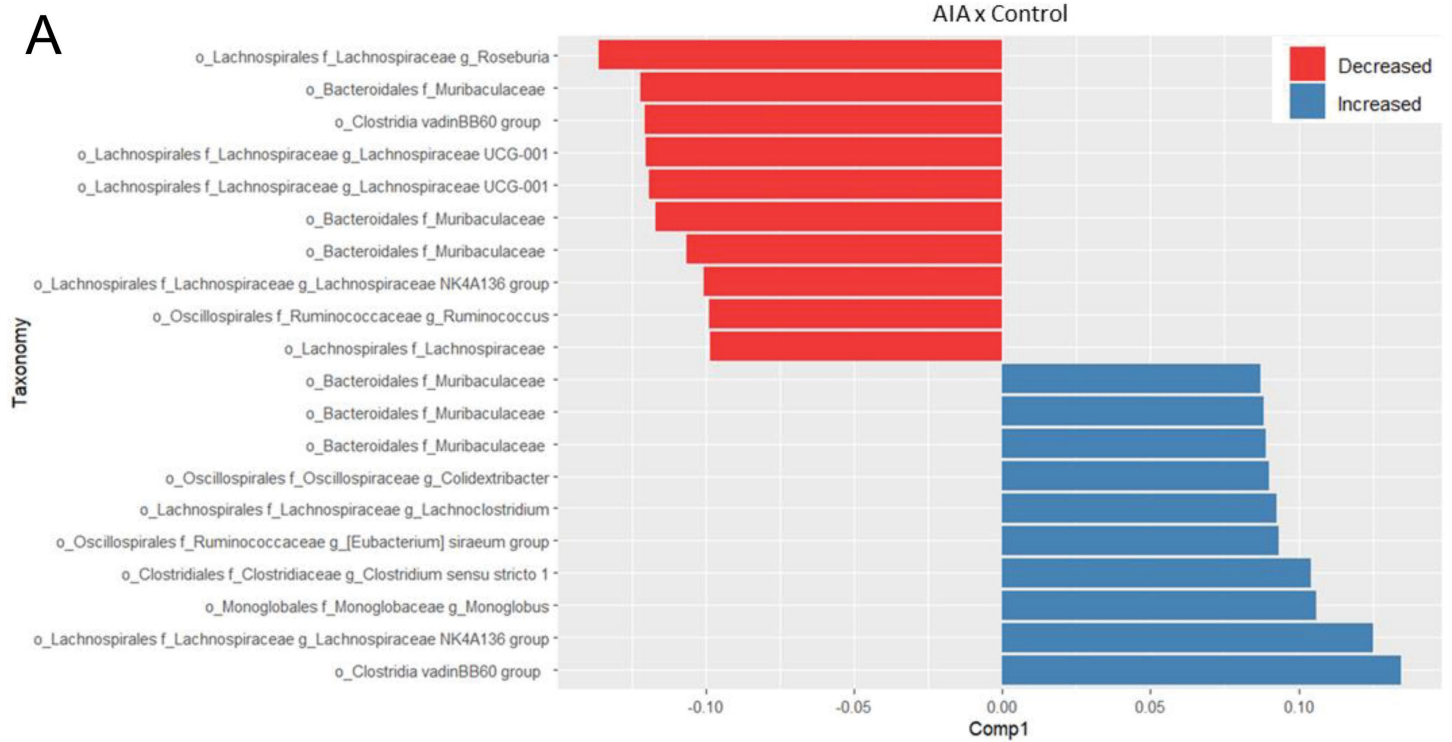
Abundance



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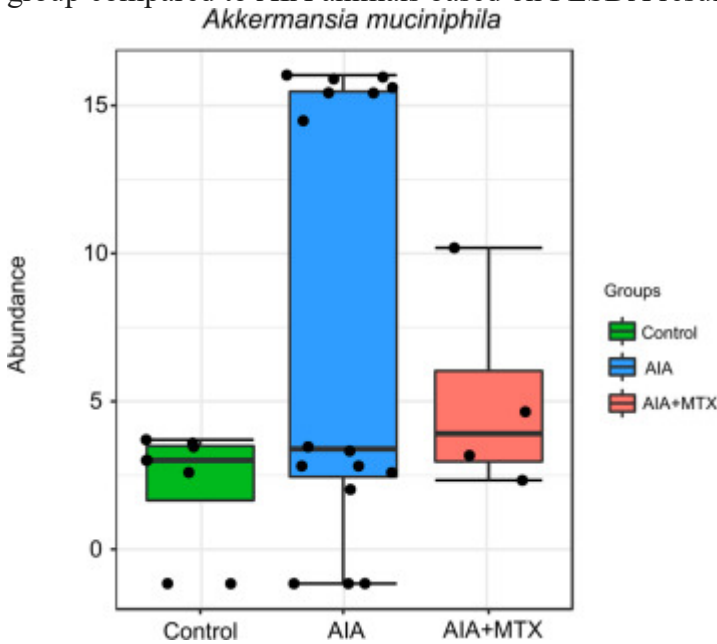
Supplementary Figure 2. Differentially abundant taxa at the species level with a statistically significant p-value, DESeq analysis.



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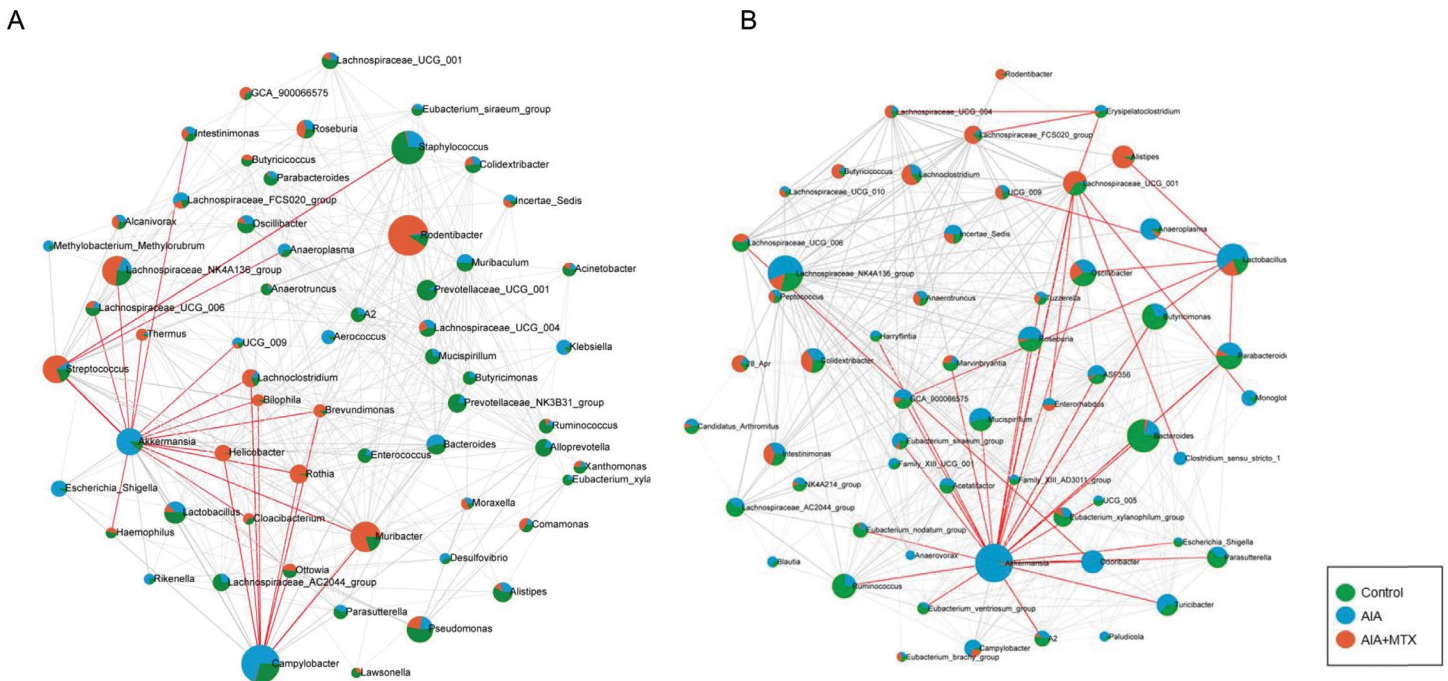
Supplementary Figure 3. (A) Graph depicting gut operational taxonomic units (OTU) with differences in relative abundance in the AIA group compared to control animals based on partial least squares-discriminant

analysis (PLSDA). (B) Graph depicting gut OTU with differences in relative abundance in the AIA + MTX group compared to AIA animals based on PLSDA results.



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Supplementary Figure 4. Differentially abundant gut taxa at the species level with a statistically significant p-value, DESeq analysis.



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Supplementary Figure 5. Co-occurrence network of microbial communities in (A) oral and (B) gut at the genus level. Note: the correlation among genera was calculated using Spearman rank correlation. The node size is based on the number of connections and coloured according to the abundance of groups, i.e., control (blue), AIA (green), and AIA + MTX (orange), and the edges represent a greater correlation than the threshold (correlation >0.3 and p value < 0.05). The edge size reflects the magnitude of correlation. Negative correlations are depicted in red and positive correlations in grey.

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