7th moip Athens, Greece September 3-5, 2021 Wyndham Grand Hotel
Face Oriented Orthodontics
GREEK ASSOCIATION FOR ORTHODONTIC STUDY & RESEARCH
7th Mediterranean Orthodontic Congress
16th Panhellenic Orthodontic Congress
WITH THE COLLABORATION OF:

PP01

γδ T cells are essential for orthodontic tooth movement

S. WALD[1,2], O. FLEISSIG[2], D. AIZENBUD[3*], S. CHAUSHU[2*], A.H. HOVAV[1*]

[1]Institute of Dental Sciences and [2]Department of Orthodontics, The Hebrew University-Faculty of Dental Medicine, Jerusalem, Israel. [3]Department of Orthodontics and Craniofacial Anomalies, Rambam Health Care Campus and The Ruth and Bruce Rappaport Faculty of Medicine Technion-Israel Institute of Technology, Haifa, Israel.

Aim

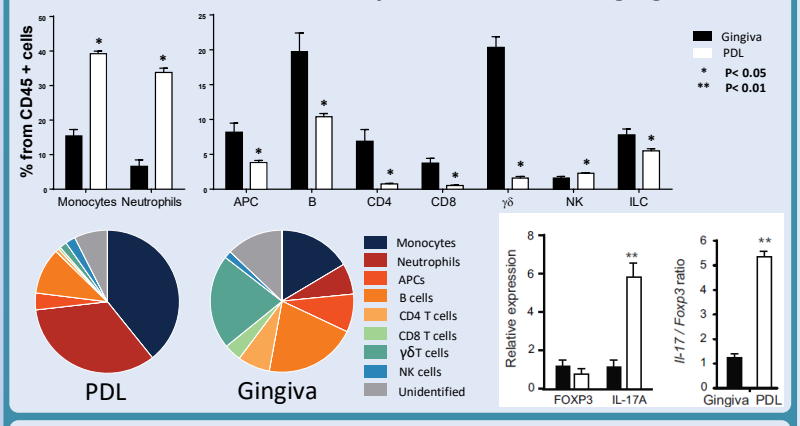
Although the immune system was shown to play a role in orthodontic tooth movement (OTM), the immunological mechanisms involved in bone remodeling during OTM have not been elucidated. γδT-cells were suggested recently to be involved in inflammation-associated bone remodeling and thus they might also play a role in OTM. We aim to dissect the kinetics and nature of the immune response developed upon OTM and to elucidate the role of γδT-cells in this process.

Materials and Methods

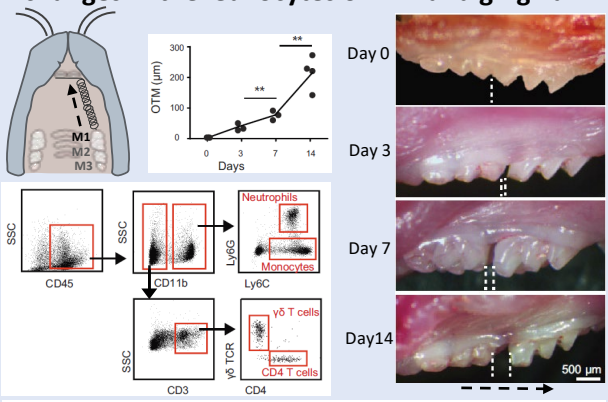
OTM was induced in mice by inserting Nickel-Titanium closed-coil for mesialization of the upper first molar. Immunological analysis of the periodontal ligament (PDL) was conducted using flow-cytometry and quantitative real-time polymerase chain reaction (RT-PCR). γδT-cell receptor-GDL knock-in mice were employed for visualization or conditional ablation of γδT-cells. Bone parameters were measured by micro computed tomography (μCT), RT-PCR and Tartrate-resistant acid phosphatase (TRAP) staining.

Results

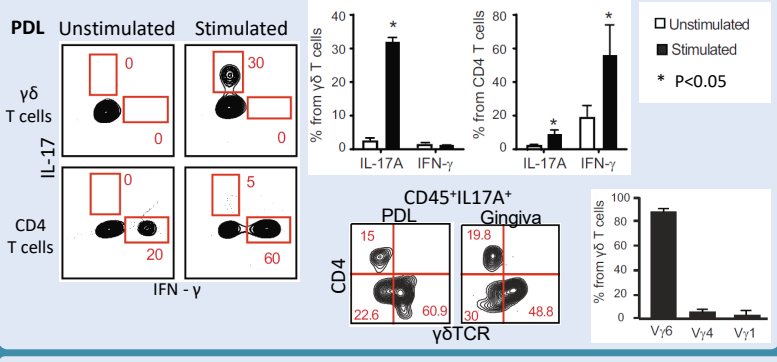
A. Characterization of leukocytes in the PDL and gingiva.

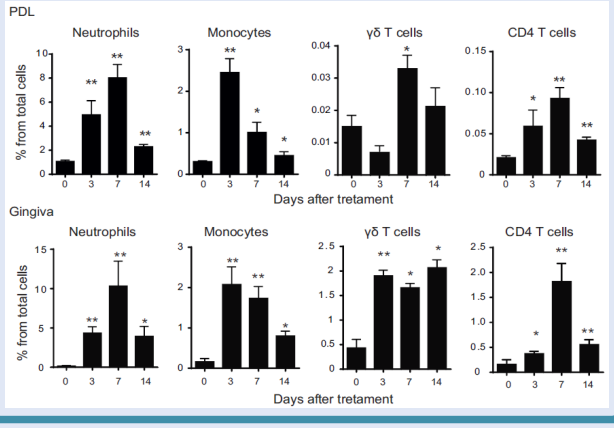


B. Orthodontic mechanical force induces major changes in the leukocytes of PDL and gingiva.

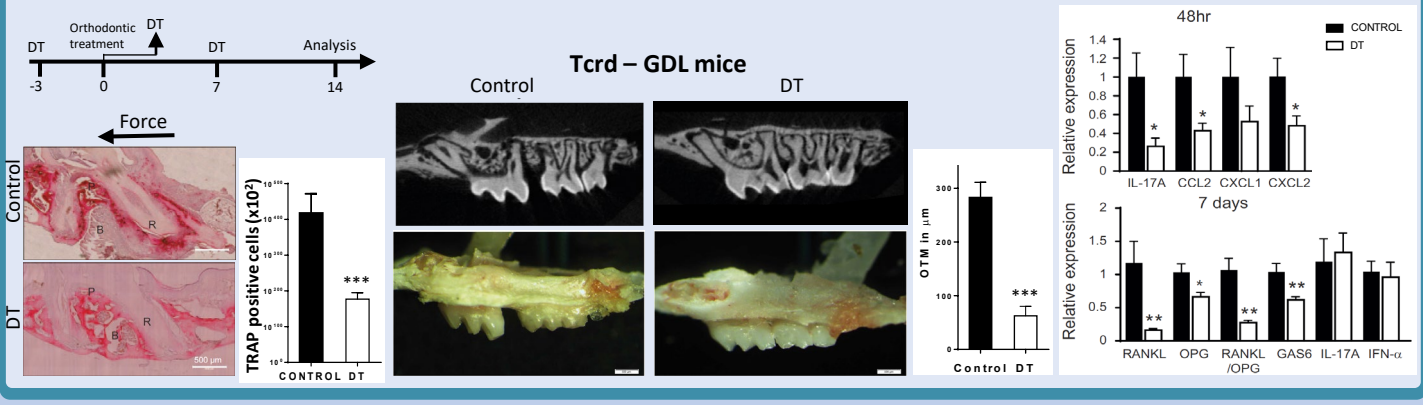


C. Interleukin 17 (IL-17)–producing Vγ6+ cells represent the main γδT cell subset in the PDL.





D. Ablation of γδT cells diminishes mechanical force–induced alveolar bone loss and tooth movement.



Conclusions

Our data suggest that γδT-cells are essential for translating orthodontic mechanical forces to bone resorption, required for OTM.

* D. AIZENBUD[3*], S. CHAUSHU[2*] and A.H. HOVAV[1] contributed equally to this study.