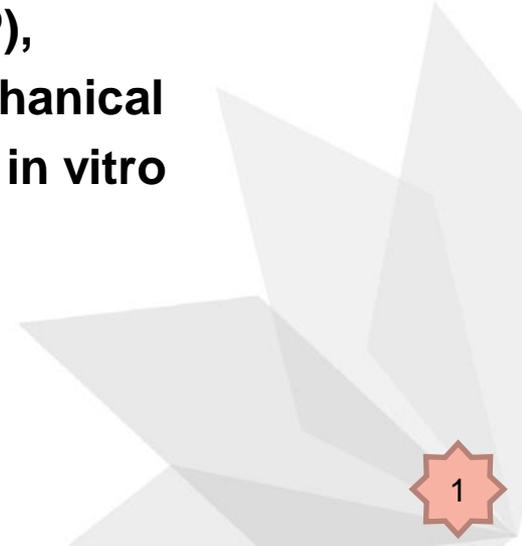
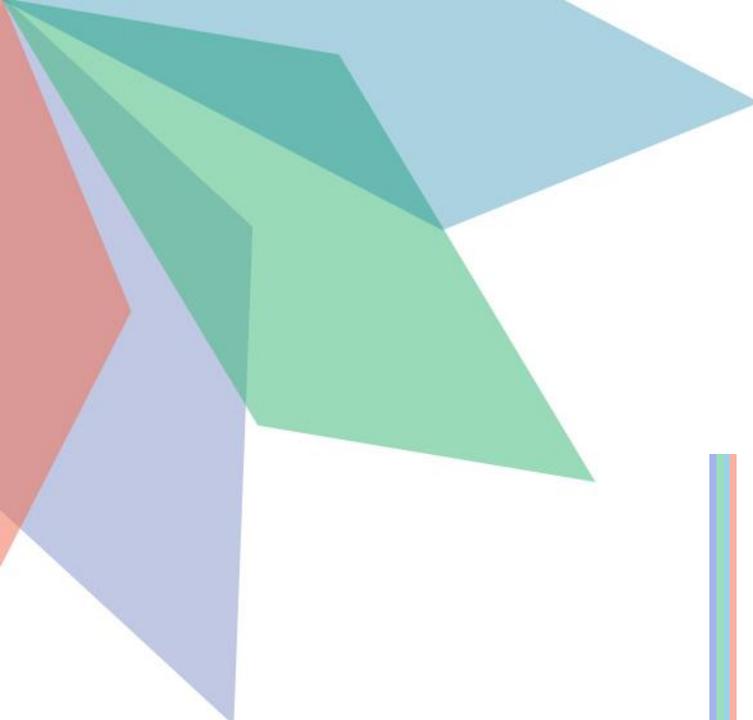




Hematology Journal Club



**Evaluation of the influence
of platelet-rich plasma (PRP),
platelet lysate (PL) and mechanical
loading on chondrogenesis in vitro**

Advised by:

Dr.Farsinejad

Presented by:

S.Salek

Scientific Reports





SCIENTIFIC REPORTS
nature research

Editor's choice: polar science
Scientific Reports presents work by international teams working in the polar regions



5.133 Impact Factor

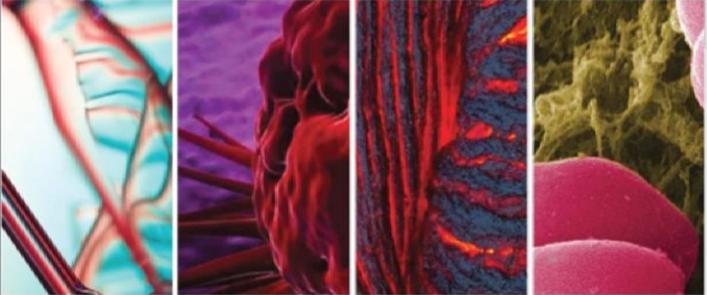
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1

Introduction

2

Methods

3

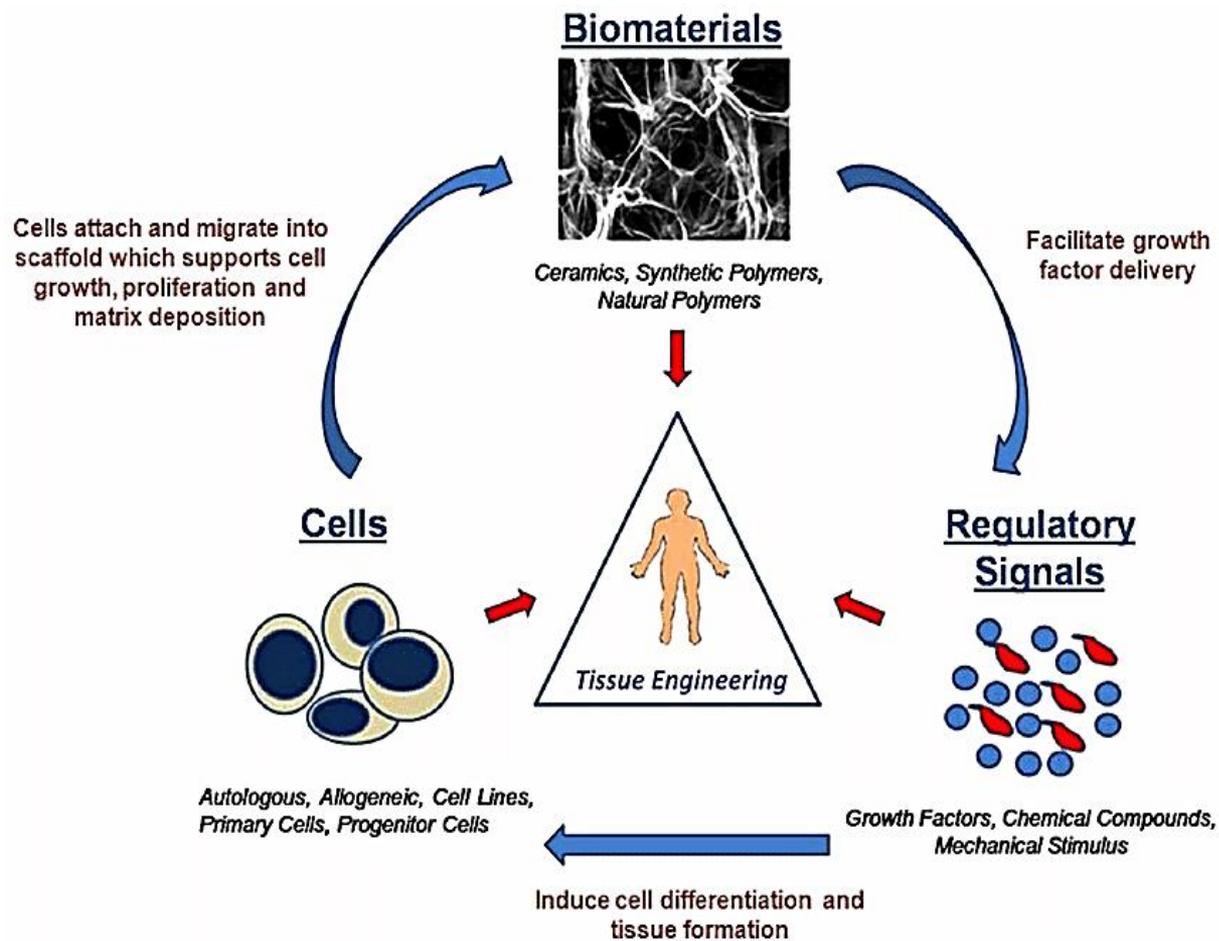
Results

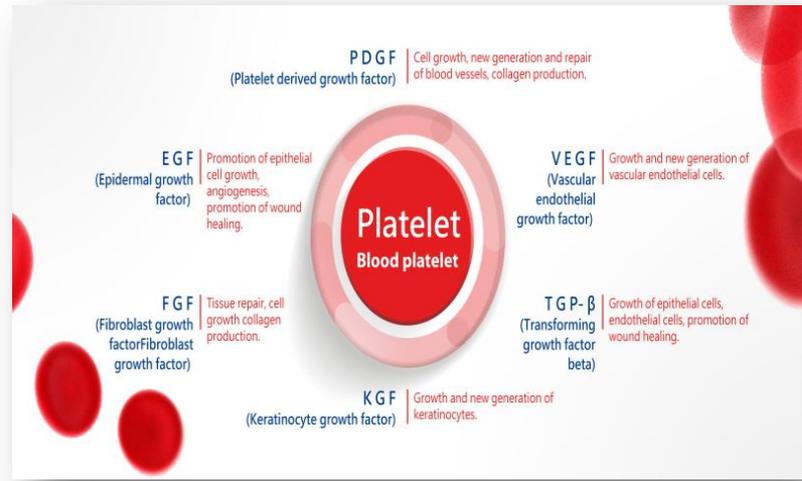
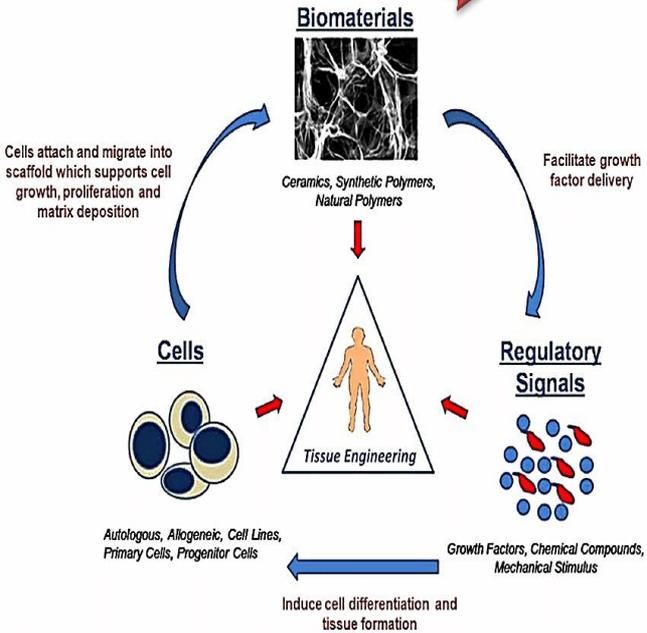
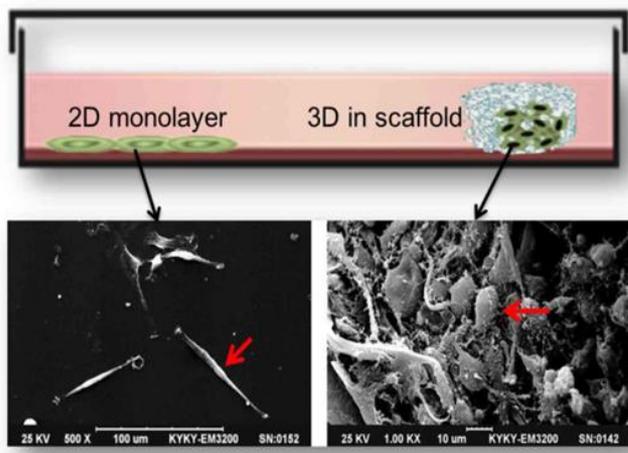
4

Discussion



Introduction

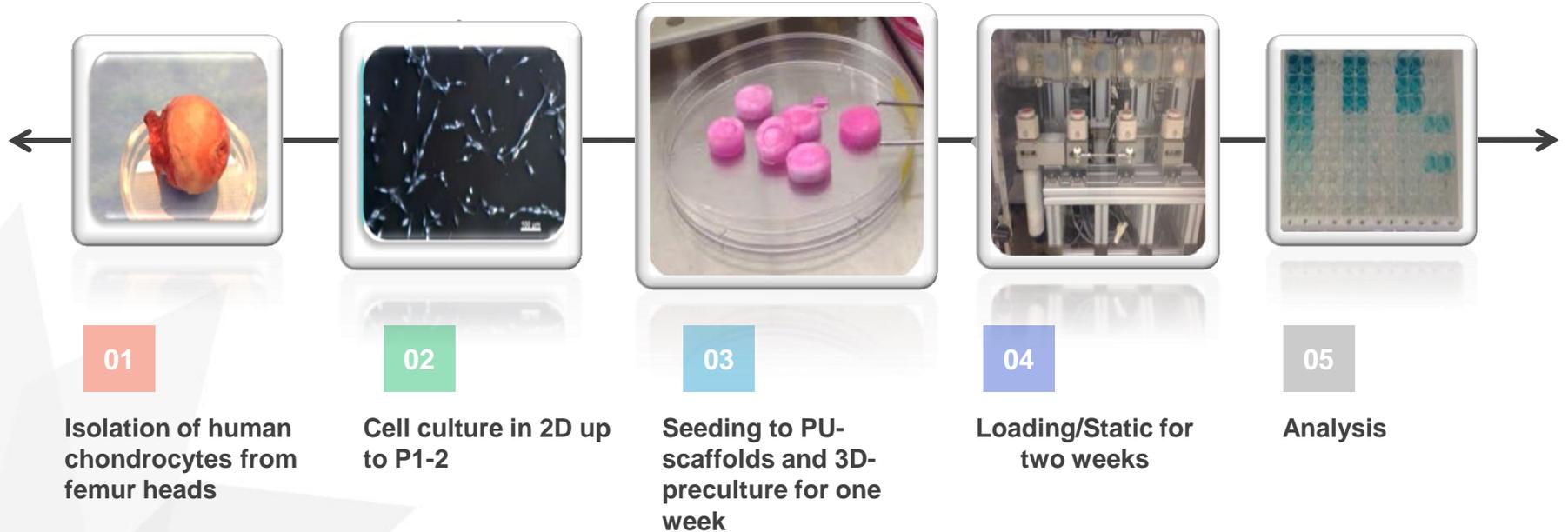


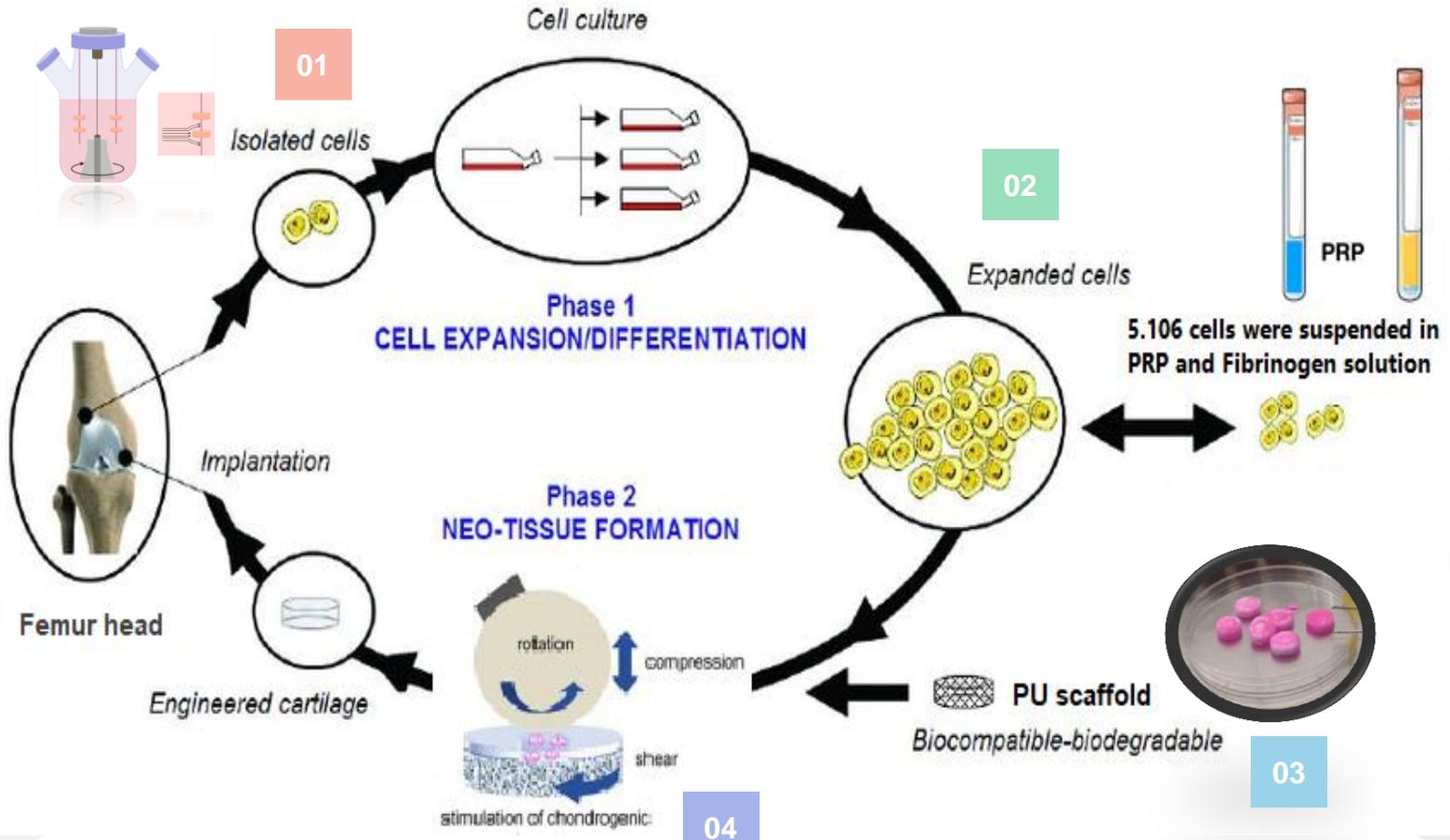




Method

Experimental design







Groups were divided into:

➤ Static (control)

1. hChondro (fibrin)

2. PRP-gel

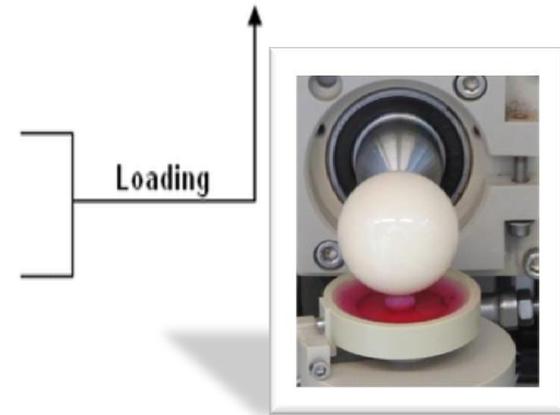
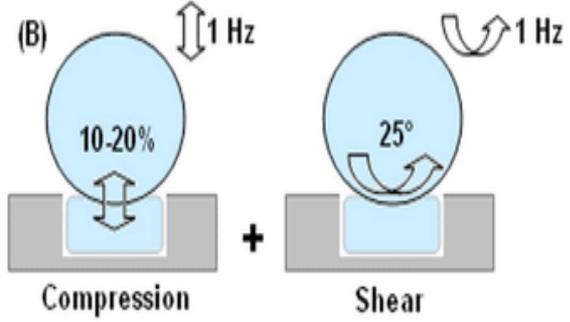
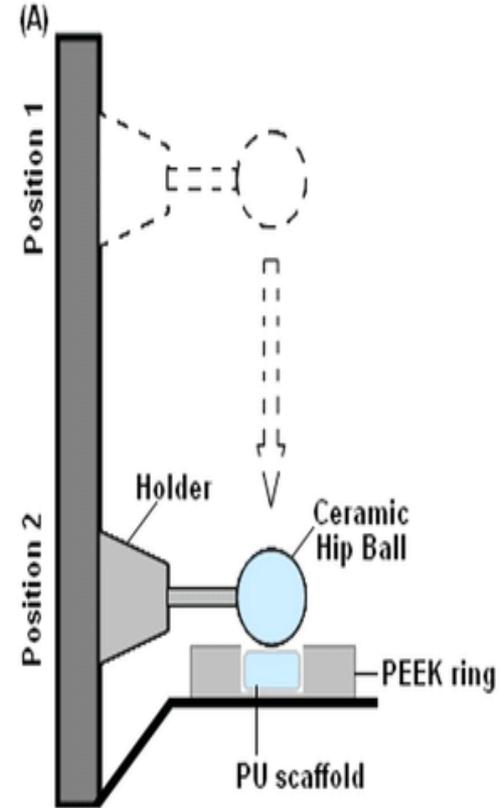
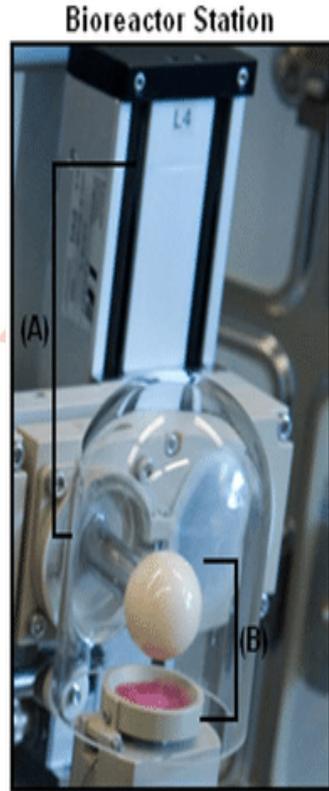
3. PL (fibrin-gel with PL added once a week with a concentration of 50 vol%)

➤ Loading

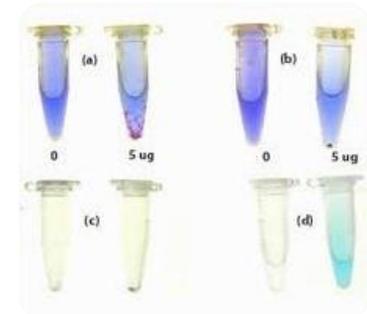
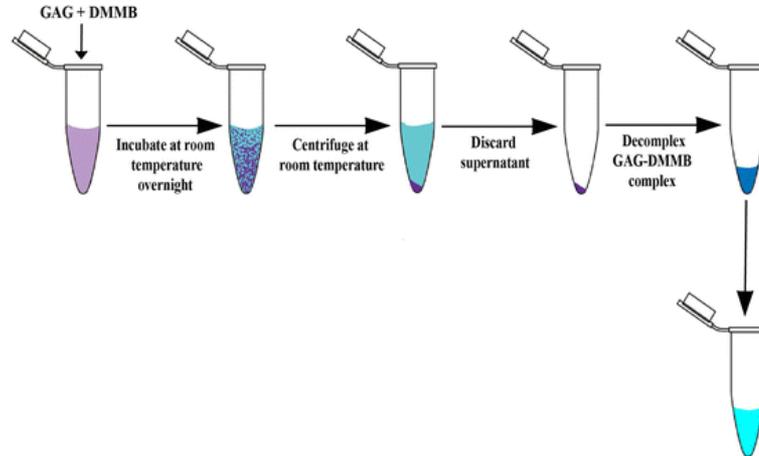
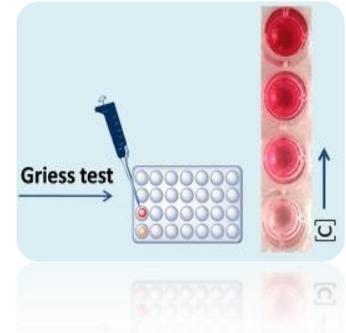
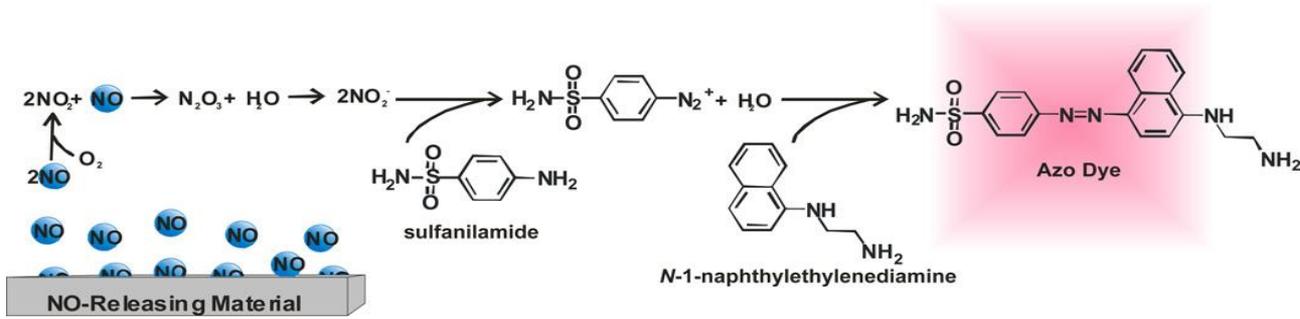
4. hChondro (fibrin)

5. PRP-gel

6. PL (fibrin-gel with PL added once a week with a concentration of 50 vol%)

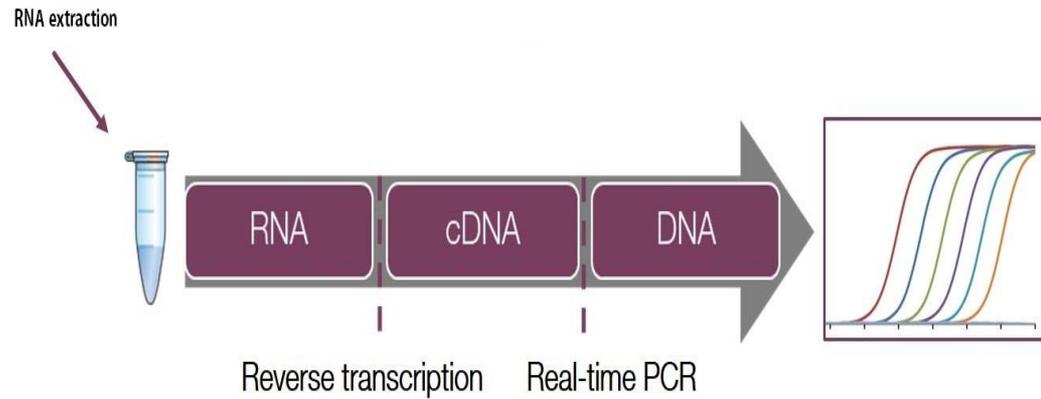


➤ Biochemical assays (GAG, NO)



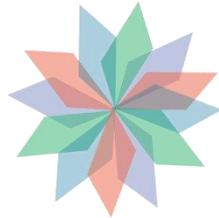


- RNA extraction, reverse transcription, (qPCR) → COMP, COL2A1, CANA, PRG4
- ELISA (total and active TGF- β)

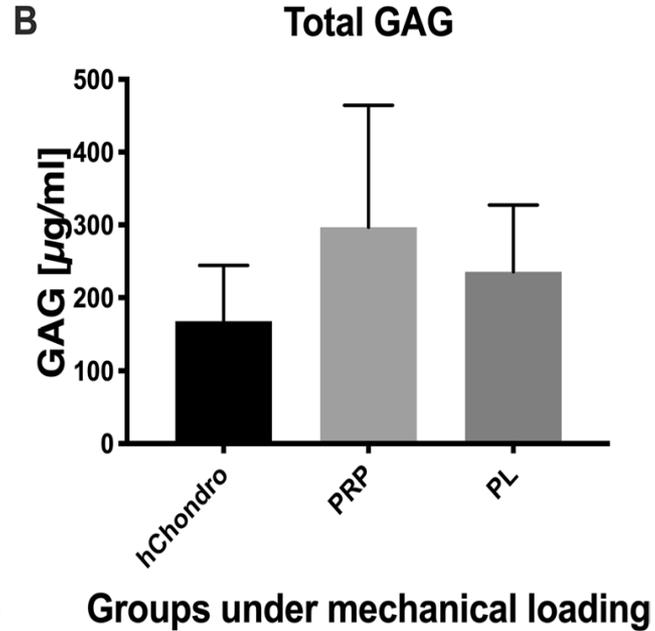
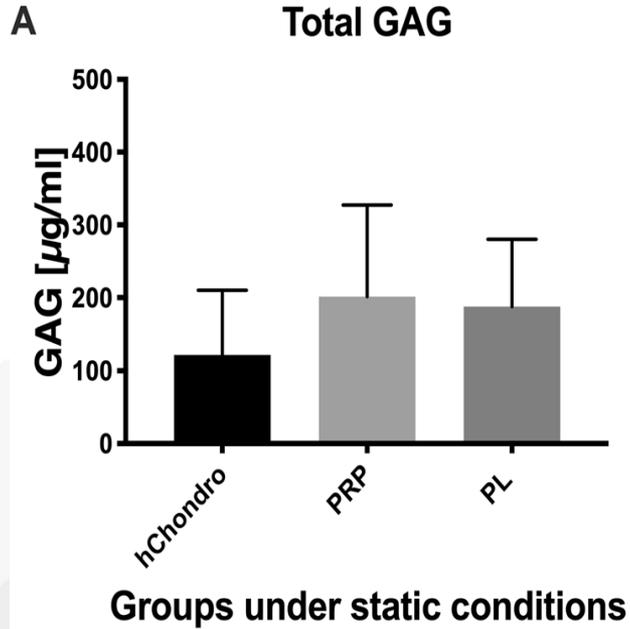


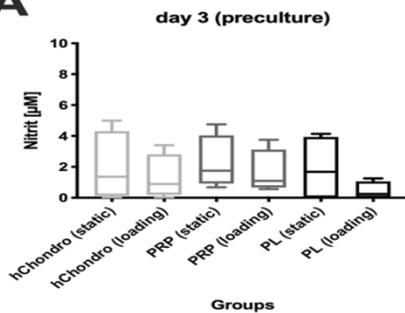
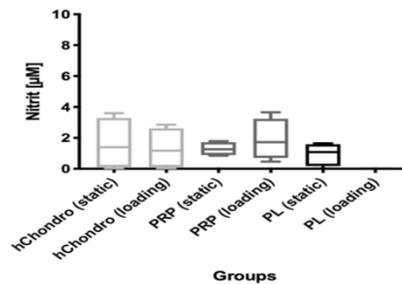
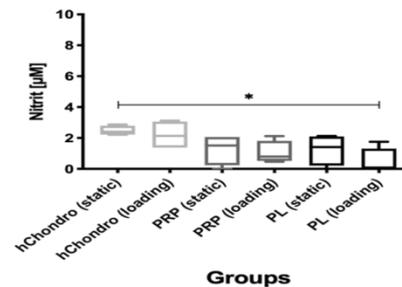
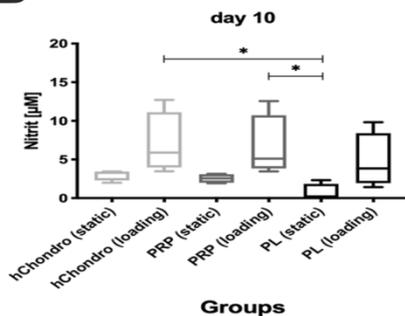
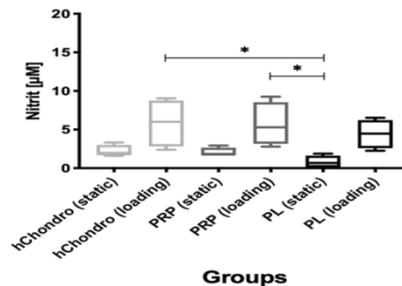
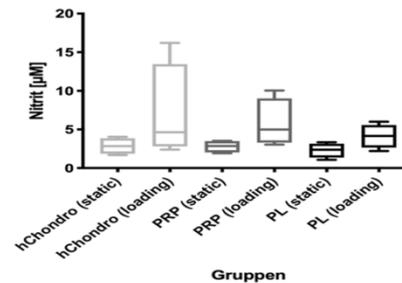
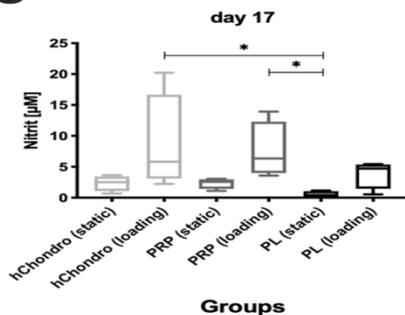
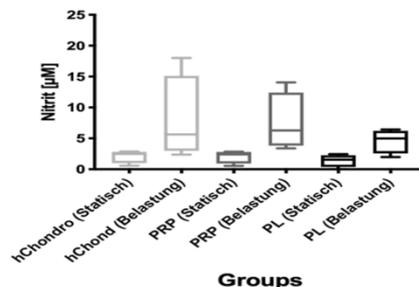


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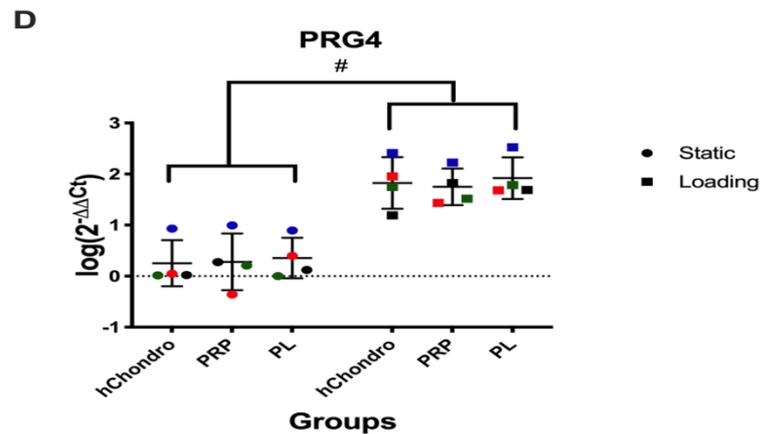
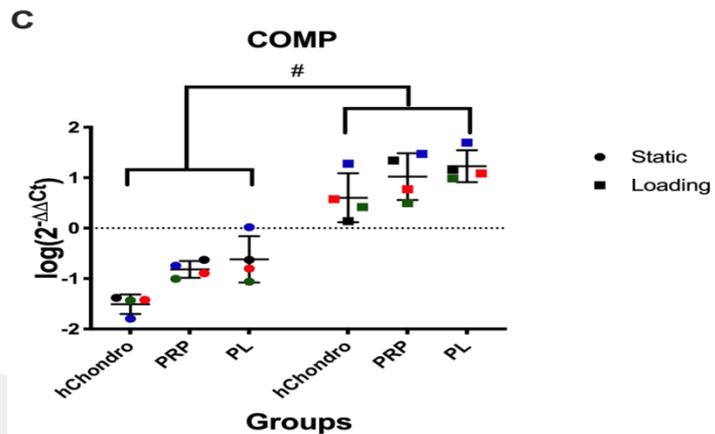
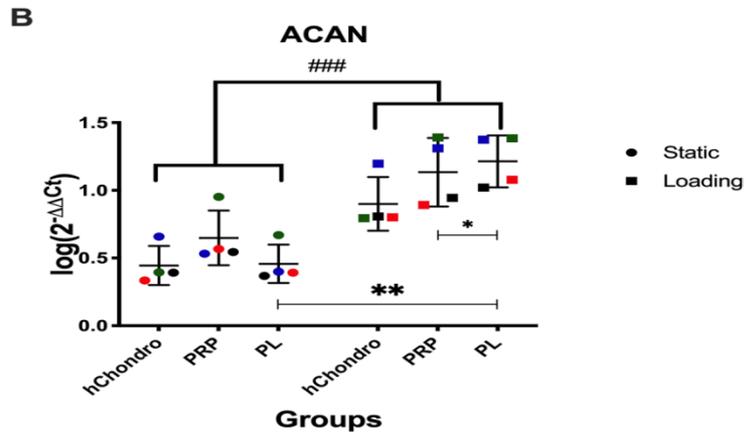
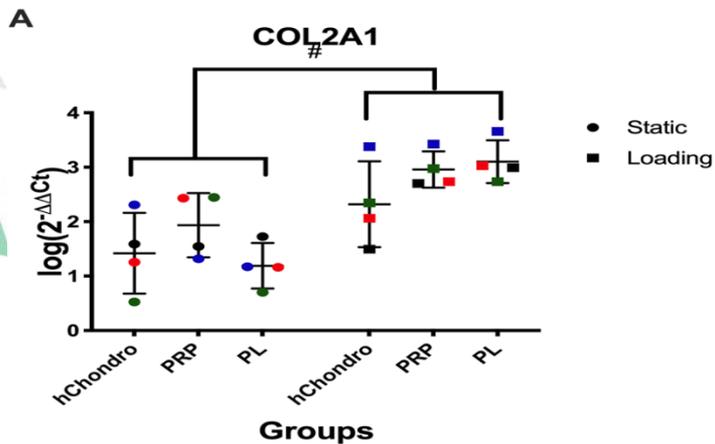


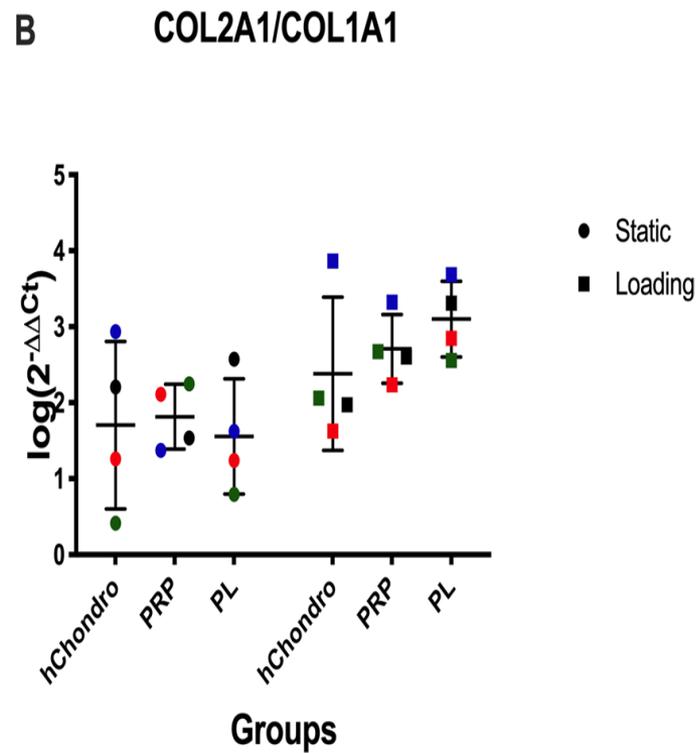
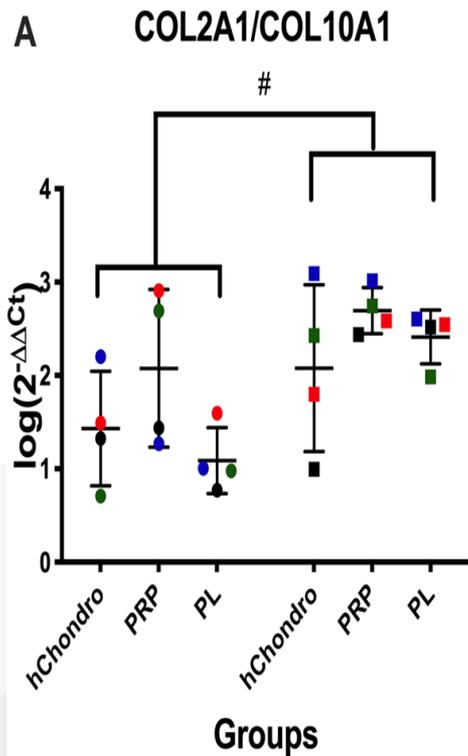
Biochemical assays(GAG,NO)

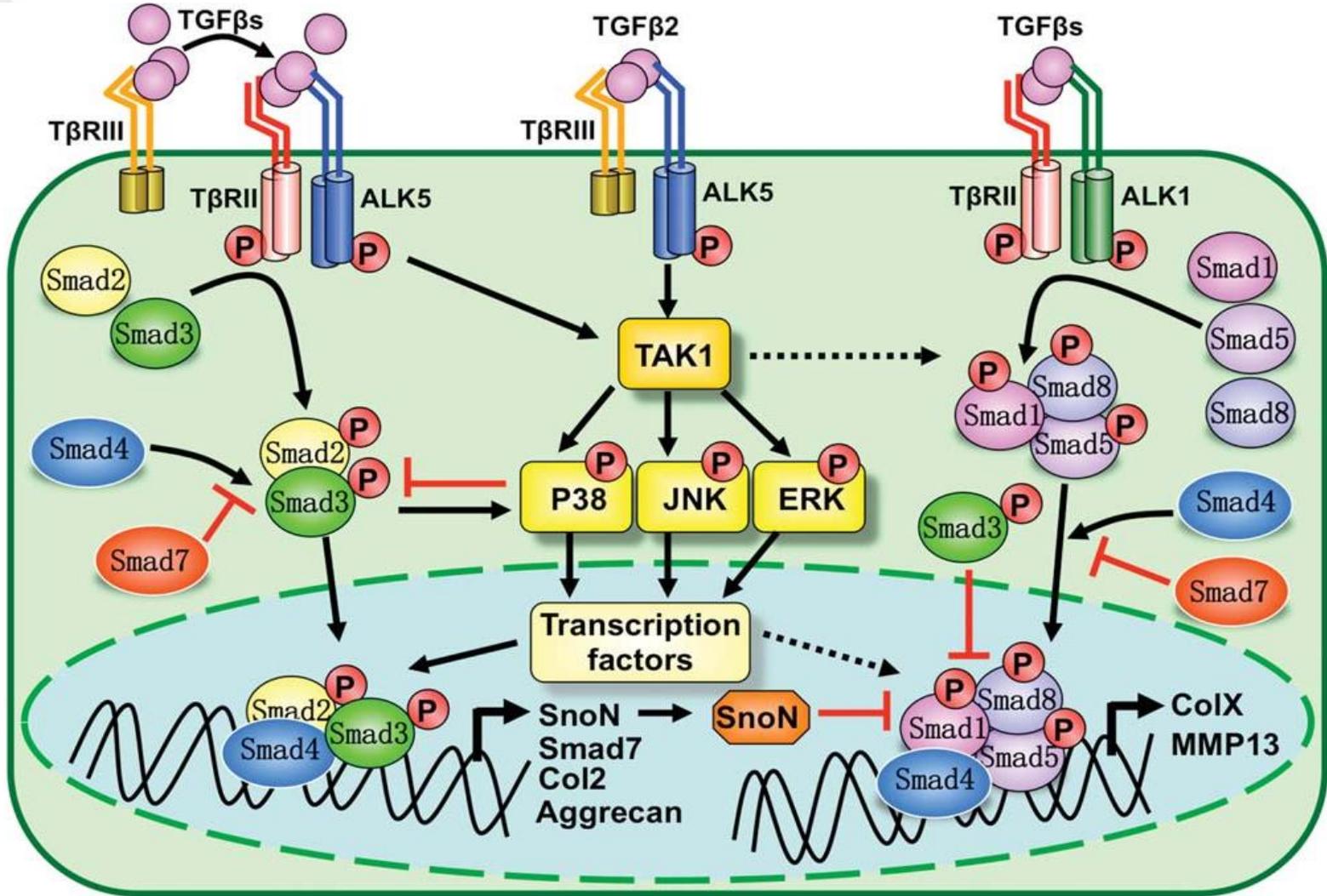


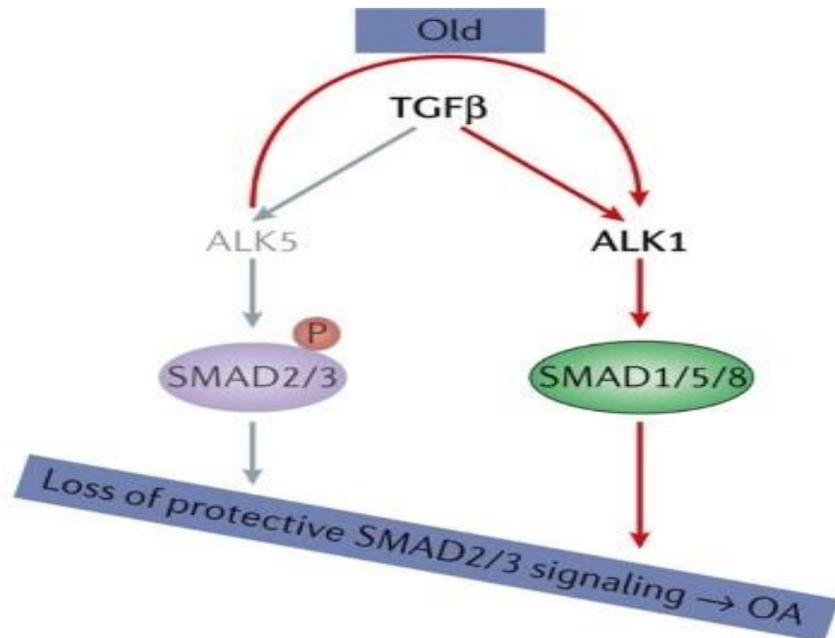
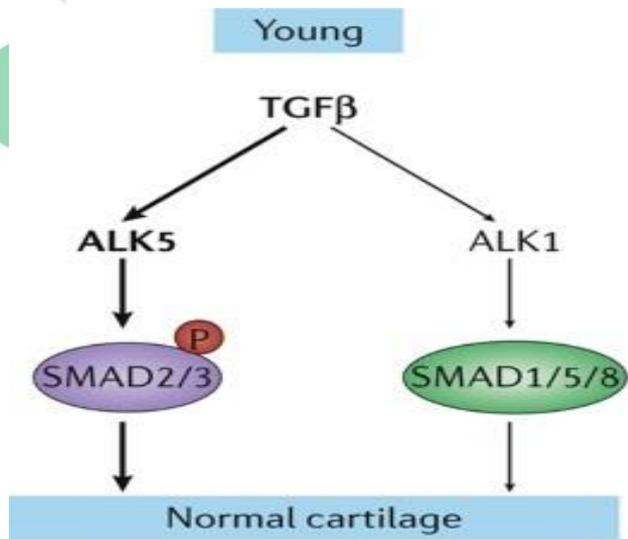
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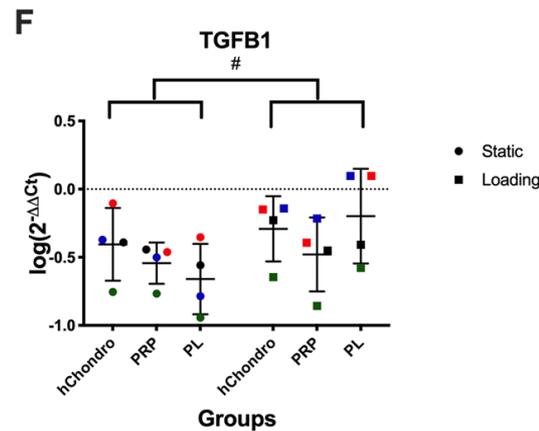
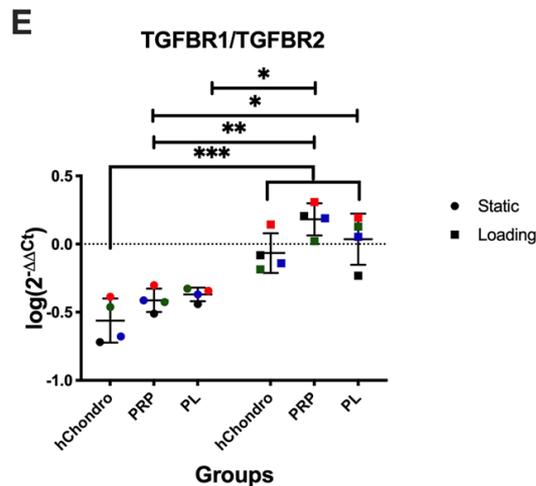
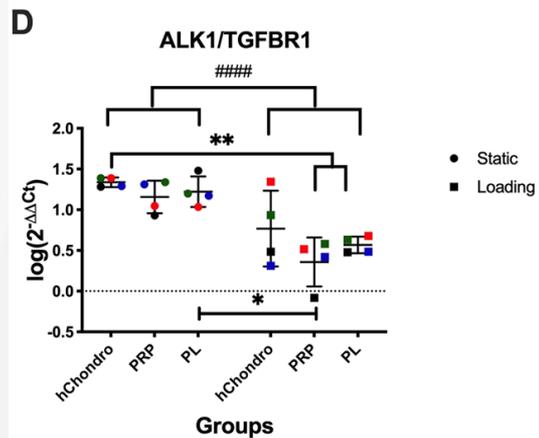
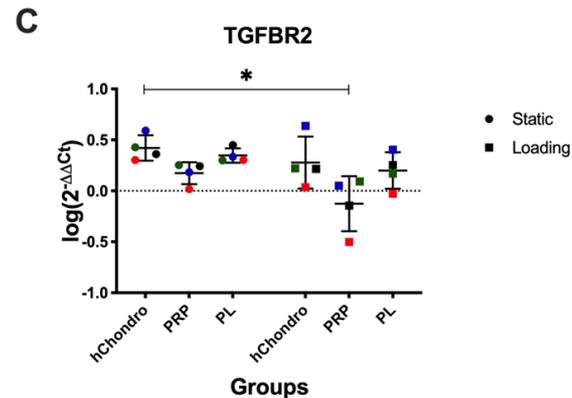
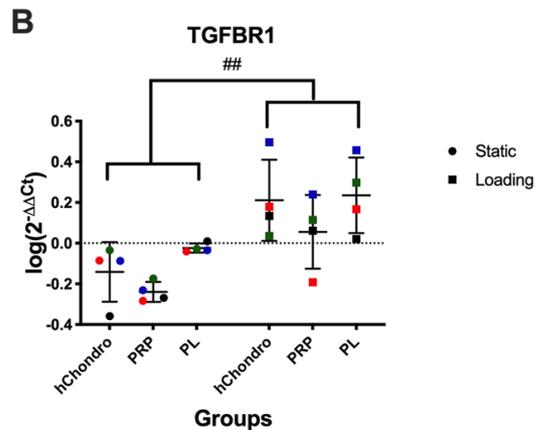
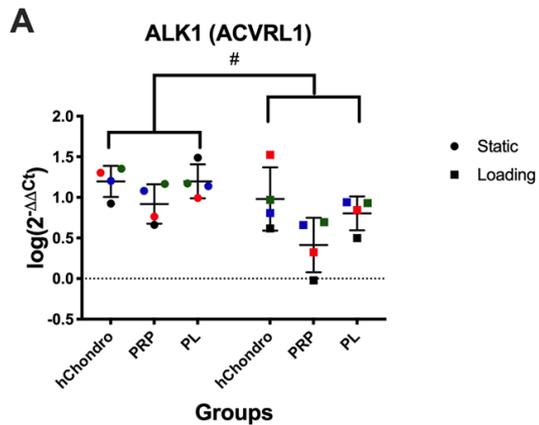
Gene expression responses







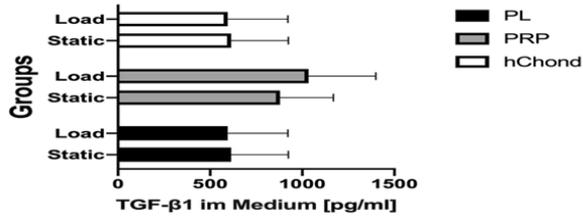




TGF- β 1-enzyme-linked immunosorbent assay (ELISA)

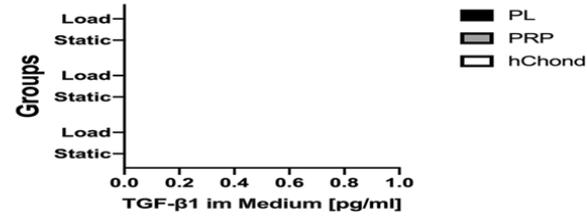
A.1

Total TGF- β 1 before mechanical loading



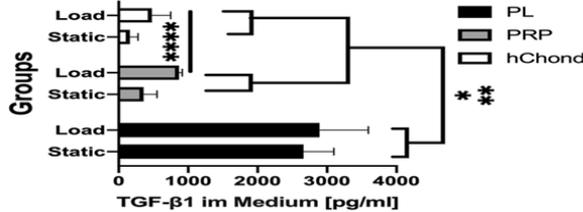
A.2

Active TGF- β 1 before mechanical loading



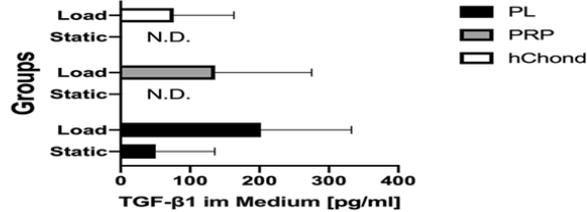
B.1

Total TGF- β 1 week 1



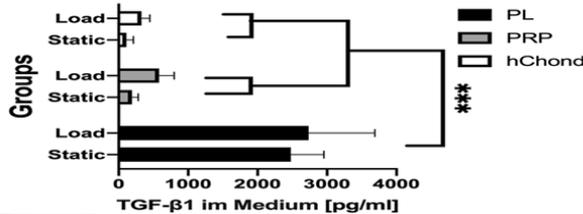
B.2

Active TGF- β 1 week 1



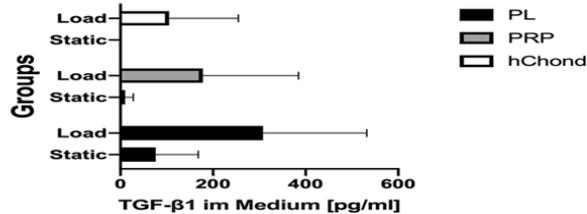
C.1

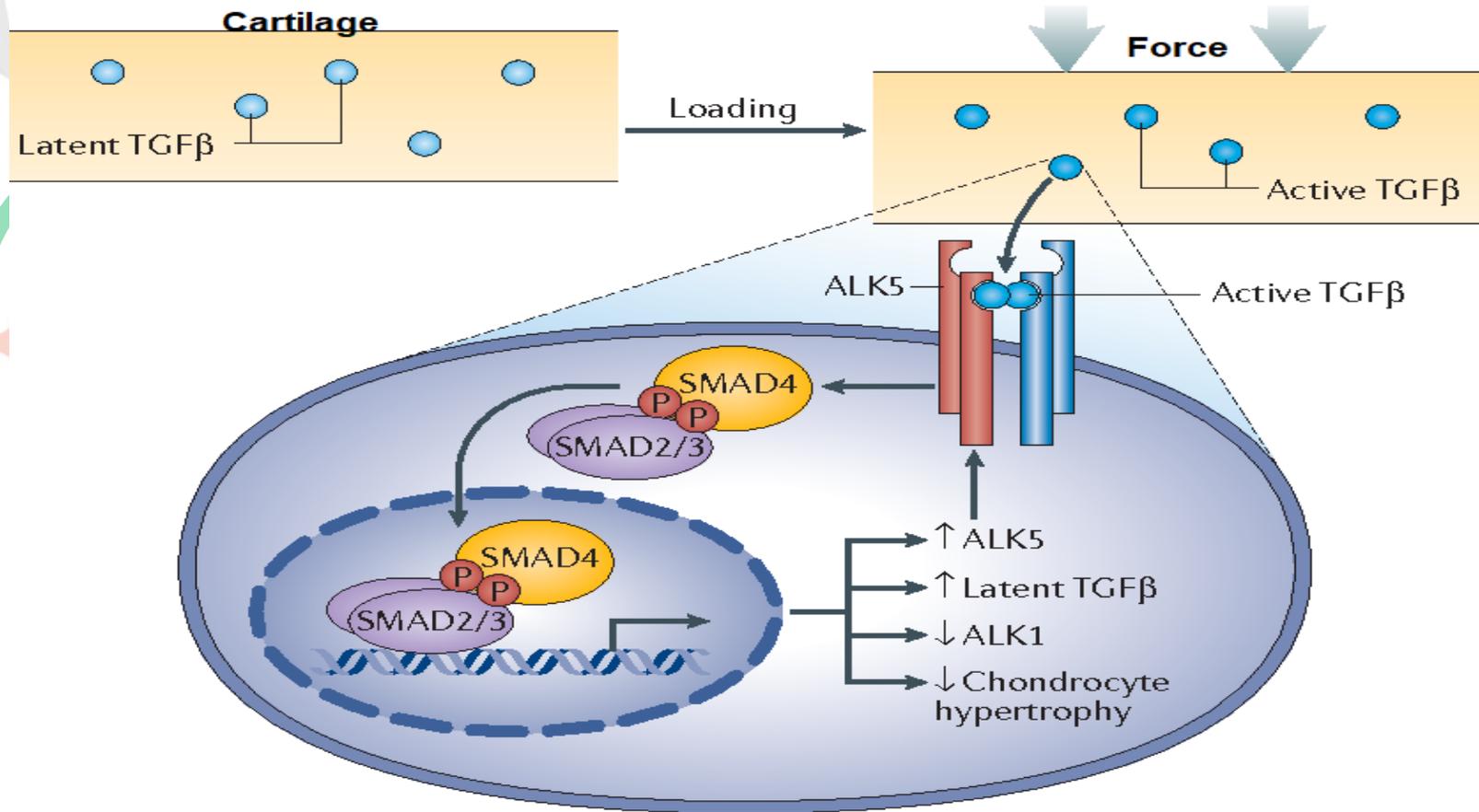
Total TGF- β 1 week 2



C.2

Active TGF- β 1 week 2







Discussion

- 
- PRP/PL in combination with multi-axial load seem to have favorable effects on chondrocytes and biochemical cytokine composition.
 - Adjuvant injection of PRP or PL can potentially provide great benefit and reduce the extent of inflammation.
 - TGF- β 1 is an elementary part of signaling pathways for cartilage maintenance and plays an important role in tissue engineering approaches. It is known that a mechanical stimulus can activate TGF- β 1.

Limitation:

- Lack of study of other growth factors and molecules released from platelet granules
- The study of only one protein from the TGF- β family
- Having a small sample of chondrocyte donors



Conclusion



PRP or PL supplementation together with mechanical loading show synergistic effects while at the same time showed positive effects on chondrogenesis, reduction of the inflammatory response and an improved effect of TGF- β 1 due to a change in the TGF- β receptor balance.



