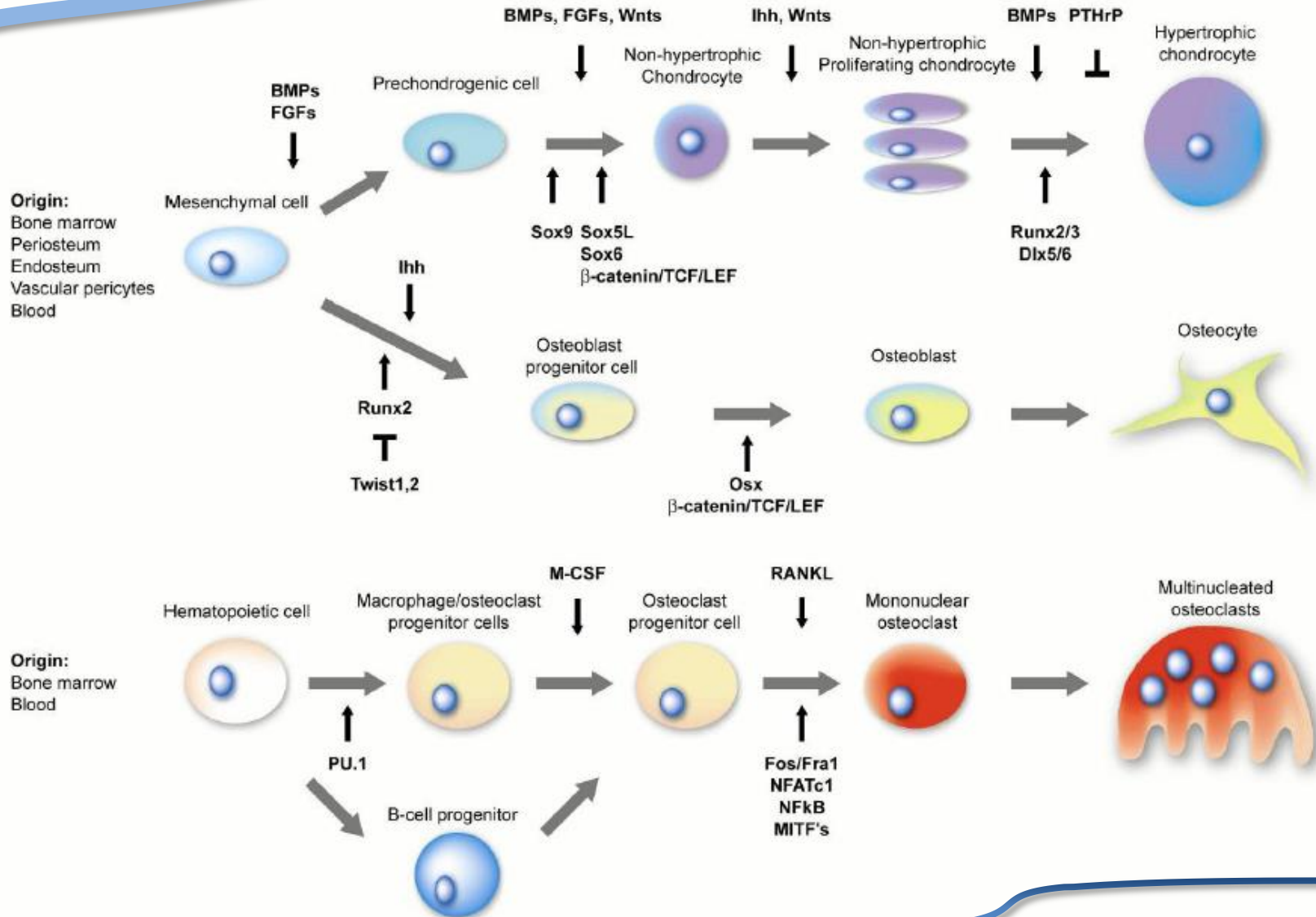
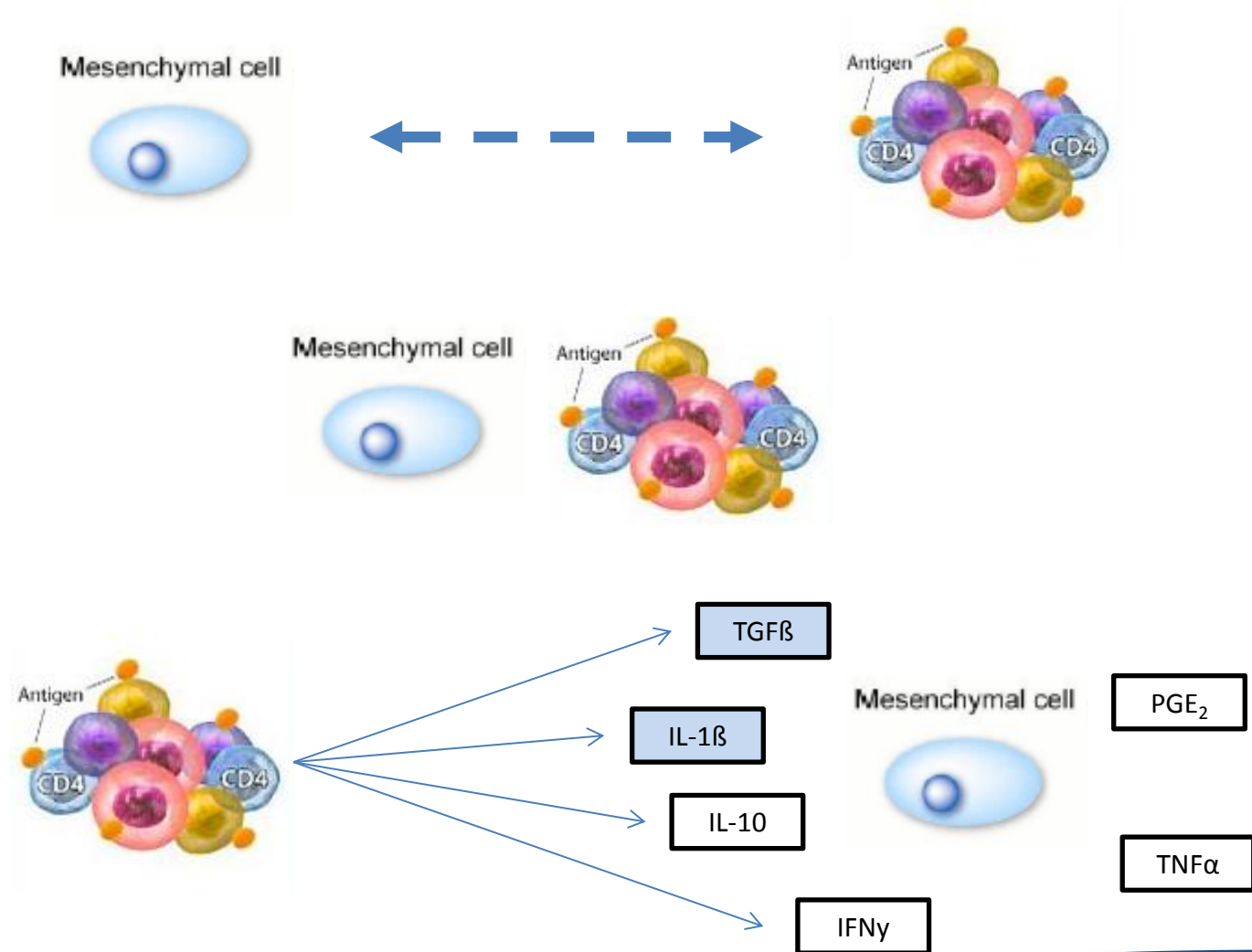


Monocytes Induce STAT3 Activation in Human Mesenchymal Stem Cells to Promote Osteoblast Formation

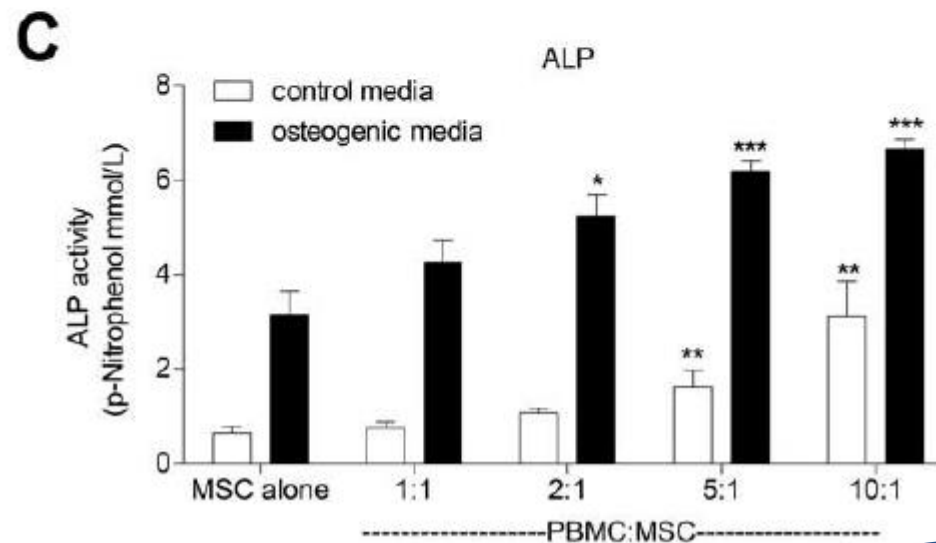
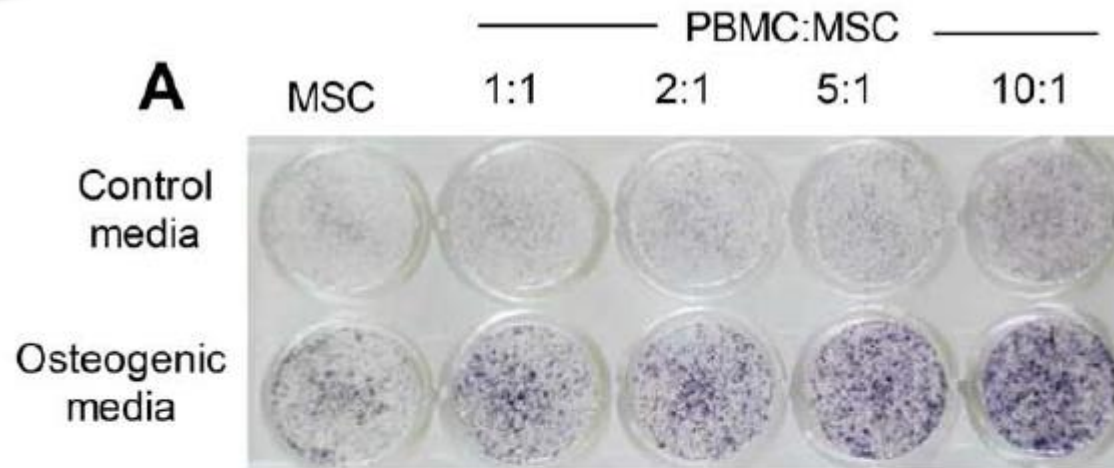
Nicolaidou V et al.

PloS One. Epub 2012 Jul 3

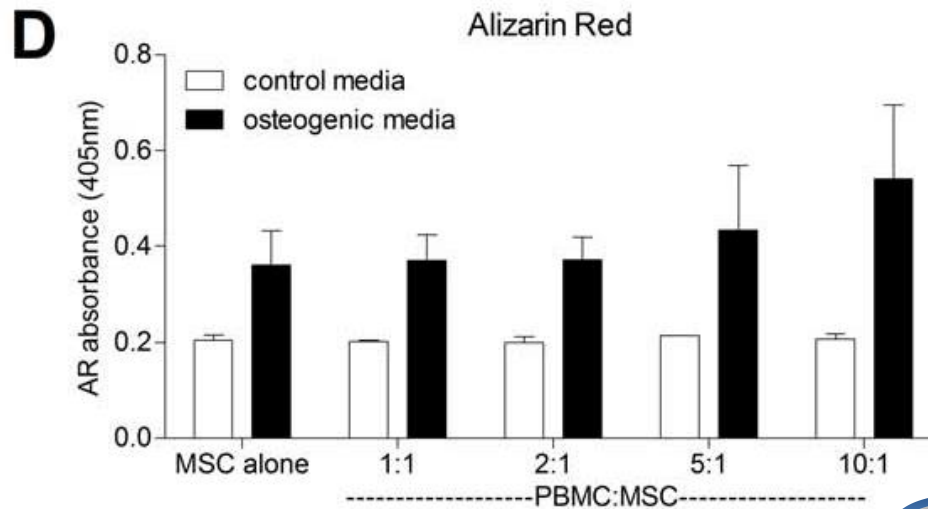
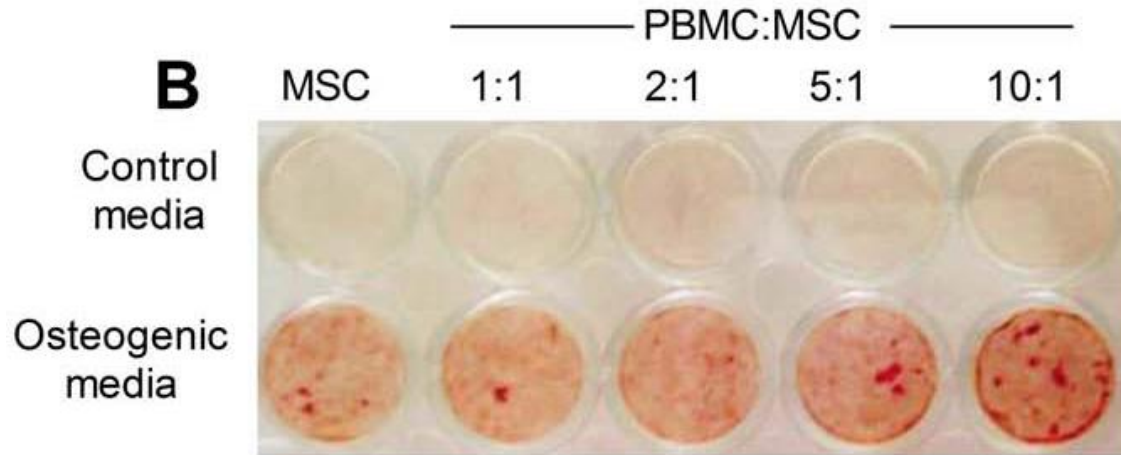




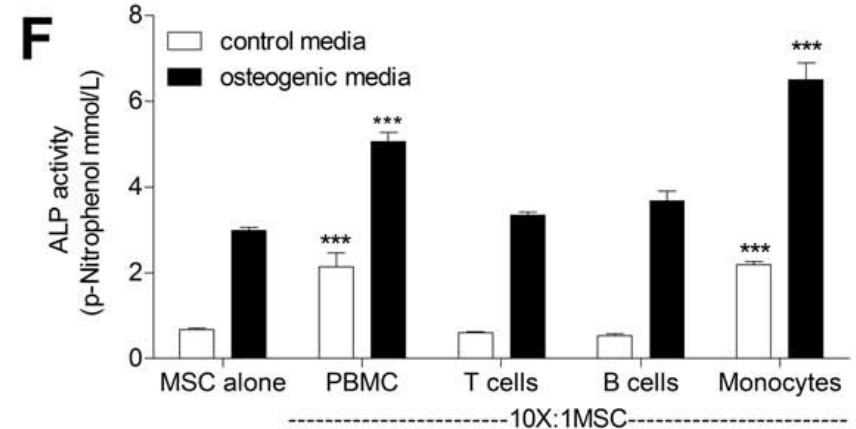
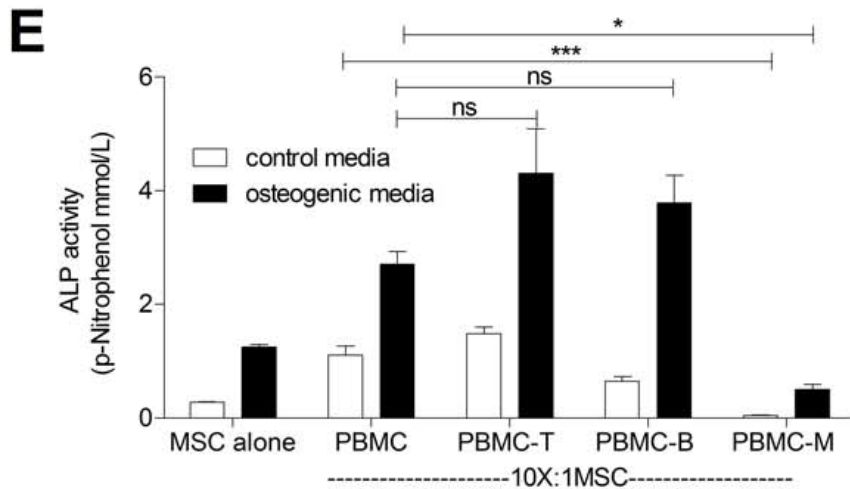
Alkaline phosphatase



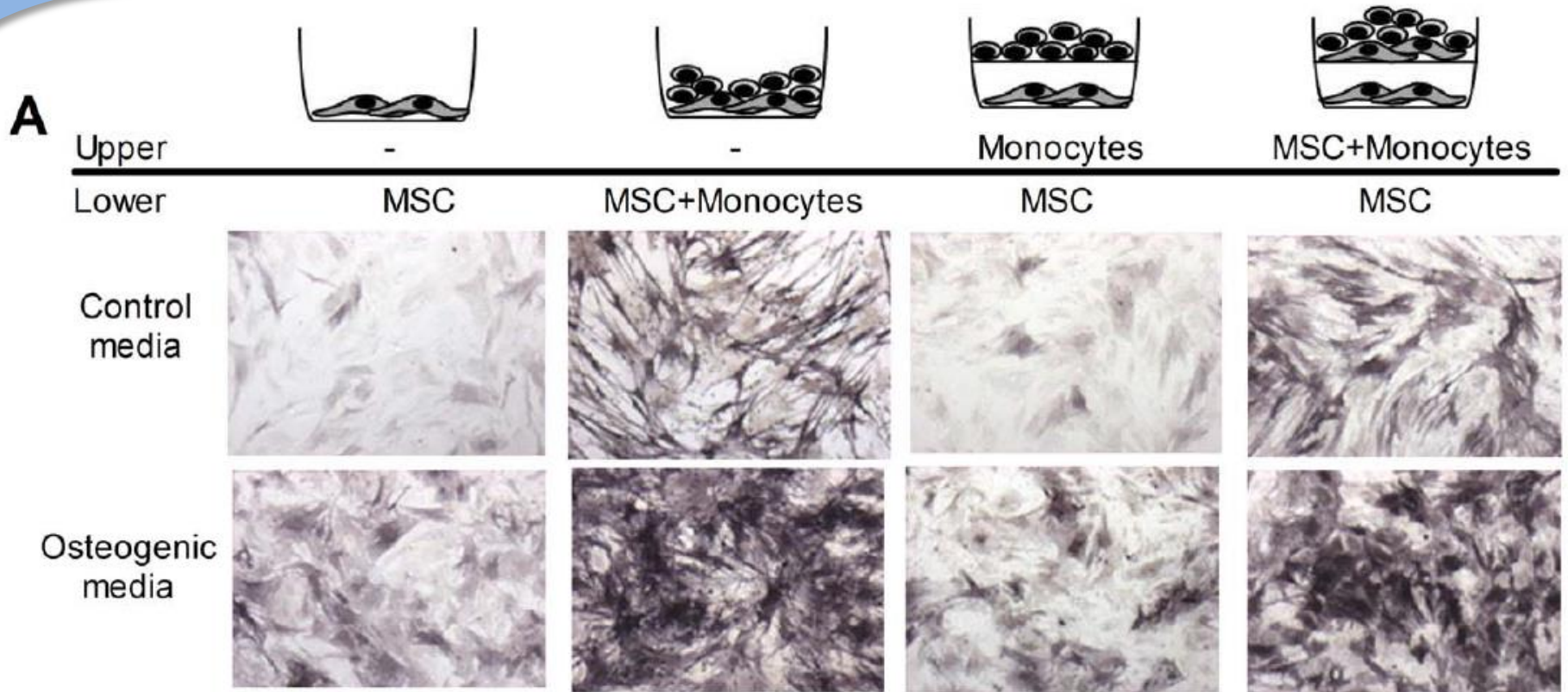
Alizarin red staining (bone nodule formation)



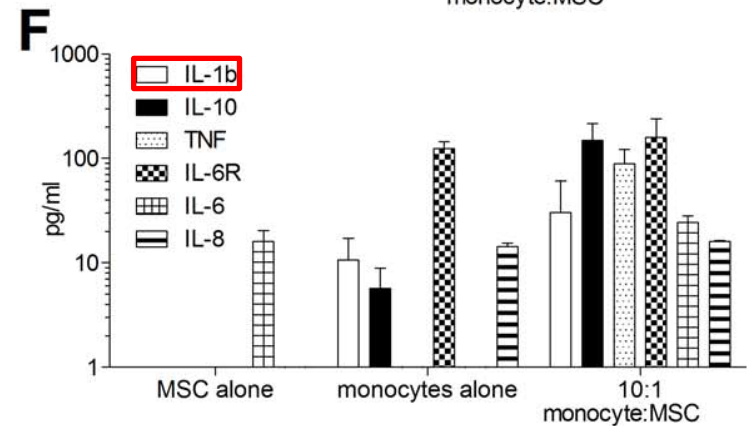
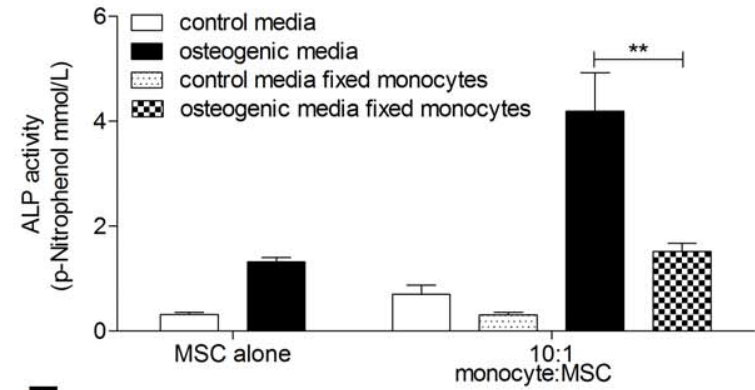
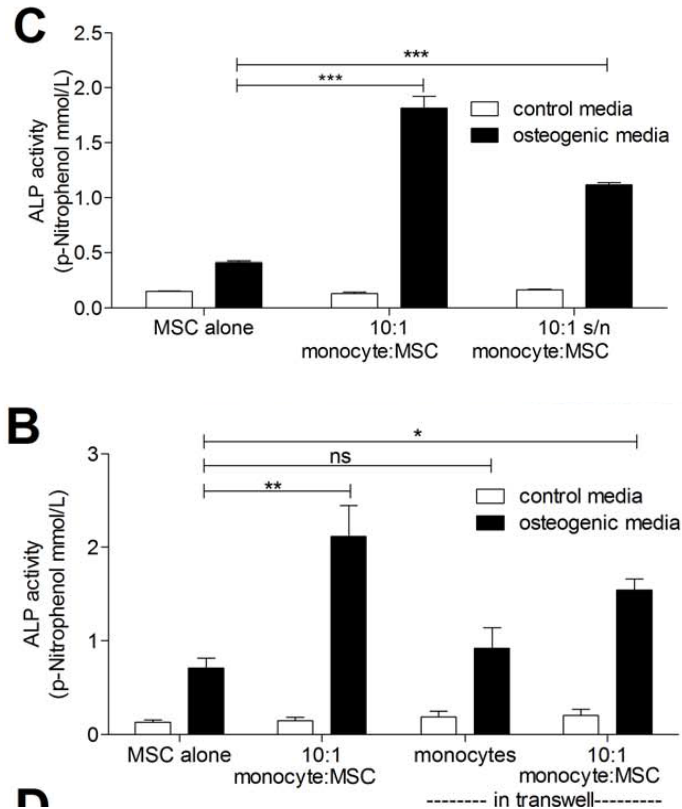
Cell Depletion



=> monocytes are responsible

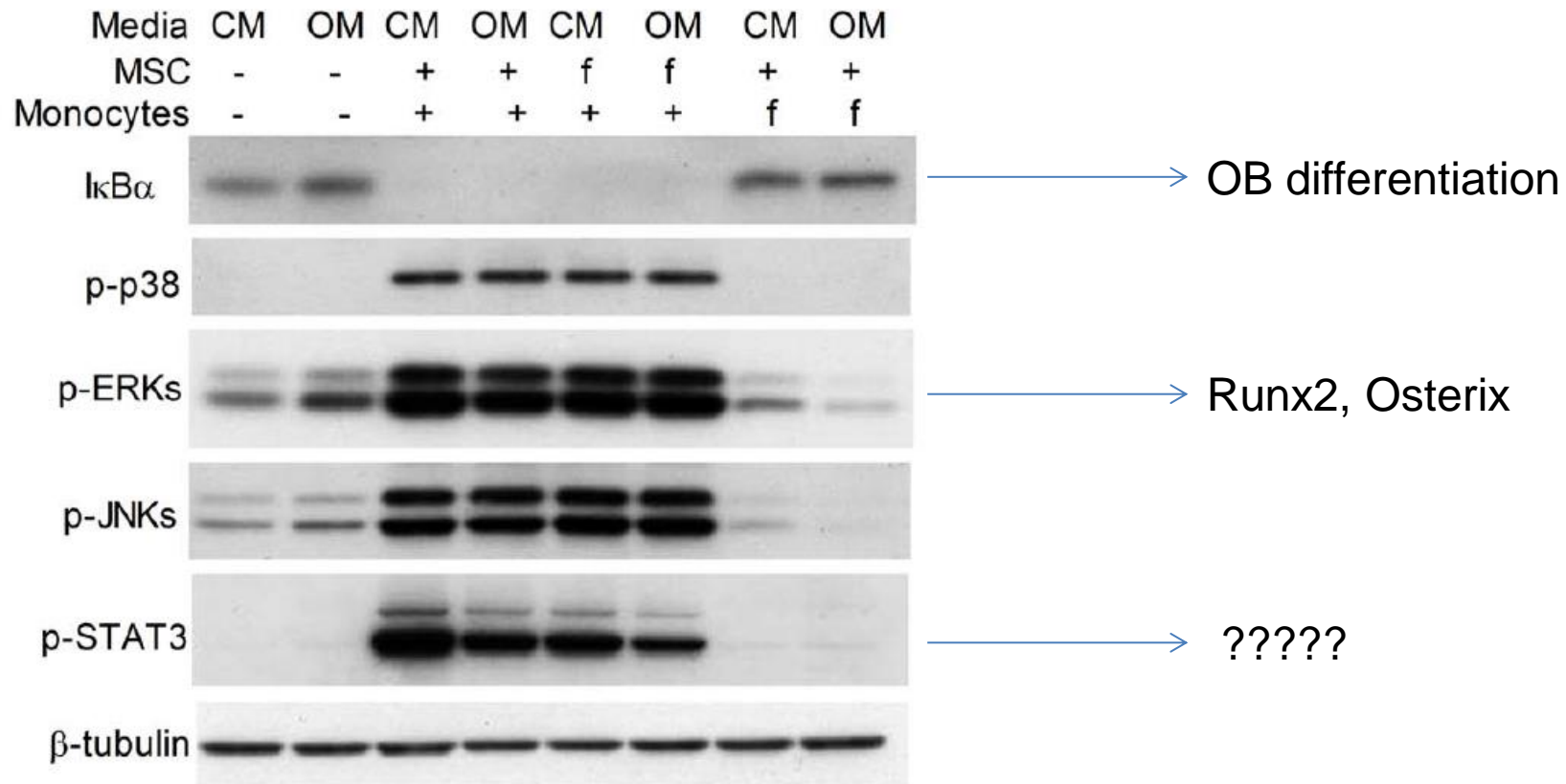


=> cell contact leads to production of soluble mediators

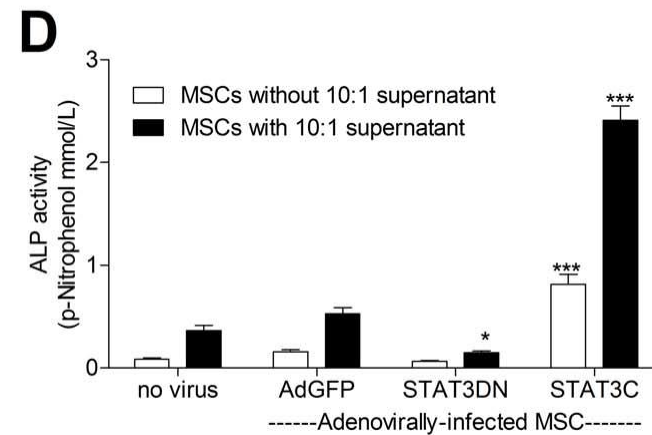
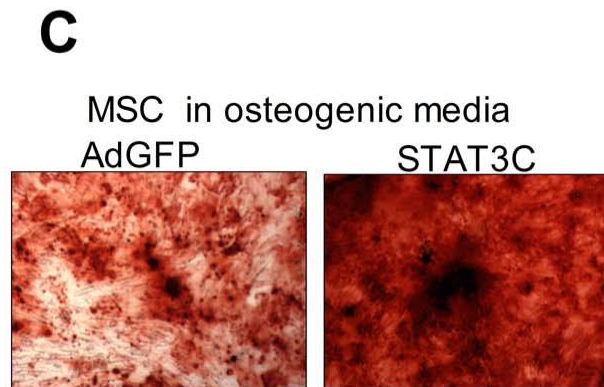
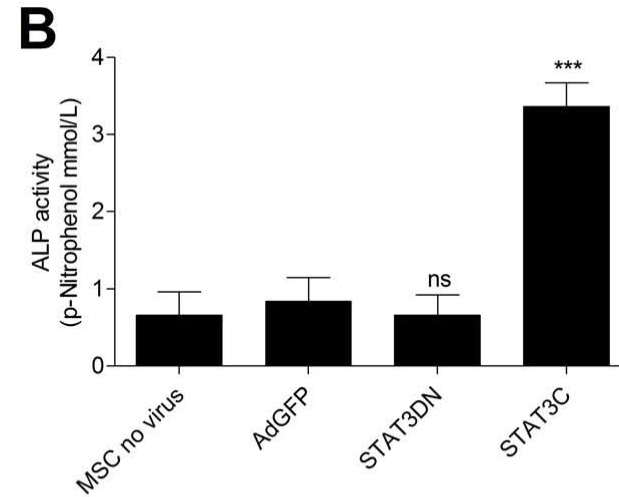
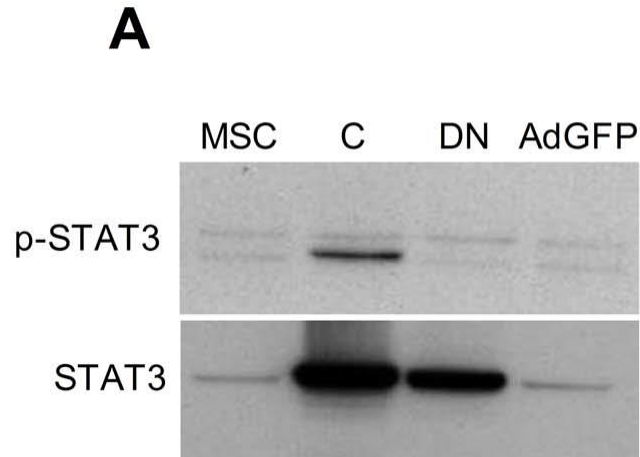


=> cell contact leads to production of soluble mediators

E



STAT 3 Activation



Illumina human HAT-12 v.30 Expression Bead Chip

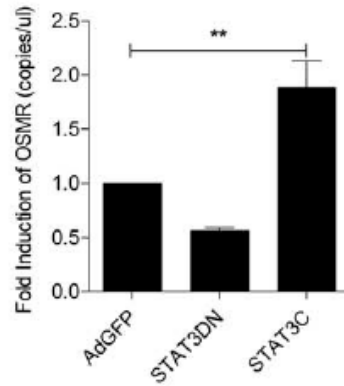


Relation to OB differentiation:

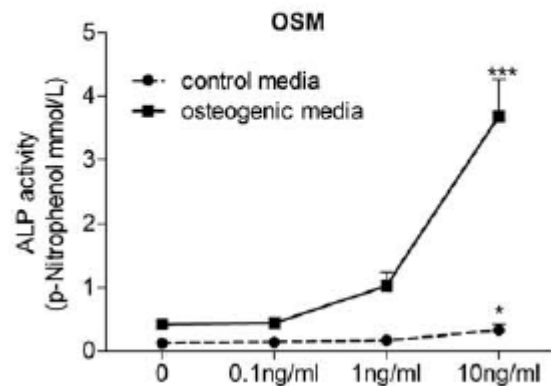
- BMPs
- TGF β
- ALP
- Runx2
- **Oncostatin**
- Dkk1 (wnt signalling inhibitor)

Oncostatin M

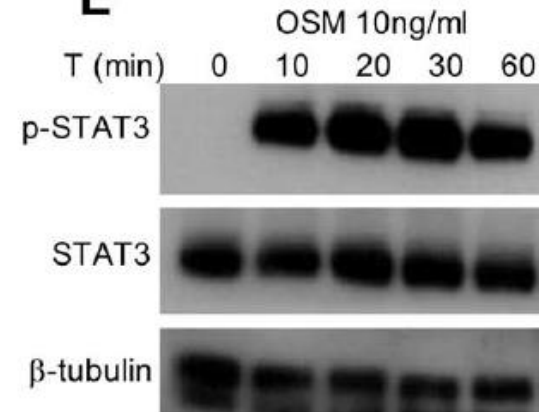
A



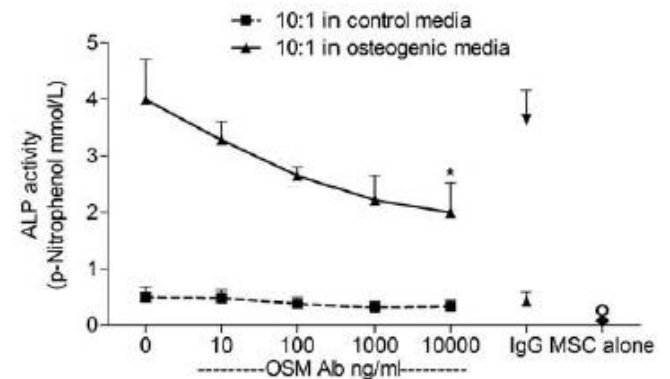
D



E

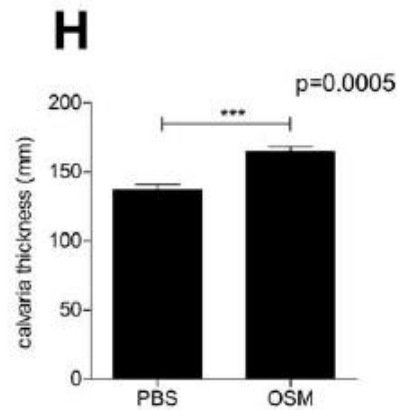
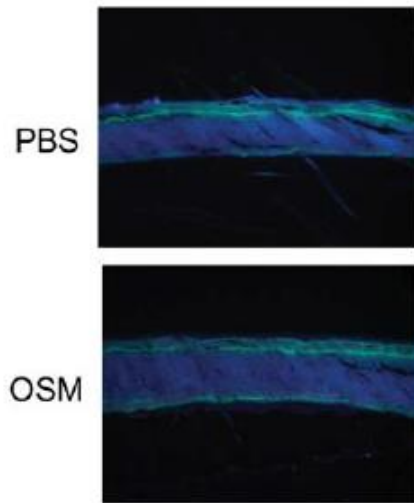


F

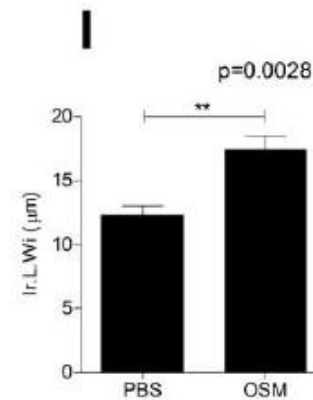


In vivo

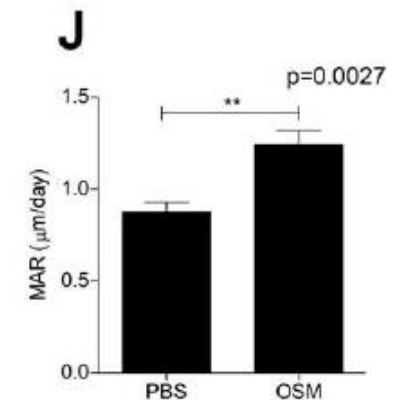
G calvaria sections



Calvarial thickness



Inter-label width



Mineral apposition rate

Conclusion

- Monocytes induce osteogenic differentiation of human MSCs
- Production of OSM, activation of STAT 3
- Phosphorylation of STAT3 in MSCs upregulates RUNX2 and ALP expression, downregulates Dkk1