

The diagram illustrates the complex signaling network connecting bone marrow-derived monocyte/macrophage precursor cells with osteoclast-specific genes. Key components include:

- Receptors and Ligands:** c-Fms (ligand: M-CSF), IFNGR (ligand: IFN γ), IL1R (ligand: IL1), TNFR1 (ligand: TNF α), TGFBR (ligand: TGF β), RANK (ligand: RANKL, inhibited by OPG), OSCAR/PTR-A (ligand: Ig-like R), TREM2/SIRP- β 1 (ligand: Ig-like R), Fc γ R (ligand: FcRy), DAP12 (ligand: Ig-like R), and IFNAR (ligand: IFN β).
- Intracellular Signaling Pathways:**
 - PI3K-Akt pathway:** Involves Src, PI3K, Akt, leading to cell proliferation and survival.
 - NF- κ B pathway:** Involves IKK α , IKK β , NIK, NF κ B, leading to DNA transcription.
 - MAPK pathway:** Involves MEK1, MKK6, MKK7, JNK, leading to AP1 activation.
 - Calcium signaling pathway:** Involves IP3, Ca $^{2+}$, CN, CaMKIV, leading to CREB activation.
 - Jak-STAT pathway:** Involves STAT1/2, leading to IRF9 activation.
- Osteoclast-Specific Genes:** CTSK, TRAP, CTR, β 3 integrin, and c-Fos are shown as downstream targets of these pathways.