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TGF β as a gatekeeper of BMP action in the developing growth plate

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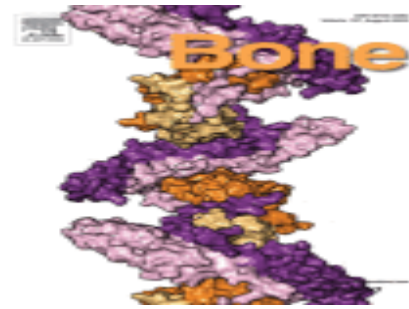
Publication Date

2020-08-01

DOI

10.1016/j.bone.2020.115439

Peer reviewed



TGF β as a gatekeeper of BMP action in the developing growth plate

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Highlights

- TGF β and BMP signaling negatively regulate one another during cartilage development.
- TGF β inhibits the BMP pathway through receptor interactions and transcriptional regulation.
- TGF β RI blocks BMP signaling through restricting ability of ACVRL1 to complex with ACTRIIB.

Abstract

The ligands that comprise the Transforming Growth Factor β superfamily highly govern the development of the embryonic growth plate. Members of this superfamily activate canonical TGF β and/or BMP (Bone Morphogenetic Protein) signaling pathways. How these pathways interact with one another is an area of active investigation. These two signaling pathways have been described to negatively

regulate one another through crosstalk involving Smad proteins, the primary intracellular effectors of canonical signaling. More recently, a mechanism for regulation of the BMP pathway through TGF β and BMP receptor interactions has been described. Here in this review, we demonstrate examples of how TGF β is a gatekeeper of BMP action in the developing growth plate at both the receptor and transcriptional levels.