

Cartilage growth and remodeling: modulation of balance between proteoglycan and collagen network *in vitro* with β -aminopropionitrile

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Summary

Objective: To examine the effect of β -aminopropionitrile (BAPN), an inhibitor of lysyl oxidase, on growth and remodeling of immature articular cartilage *in vitro*.

Design: Immature bovine articular cartilage explants from the superficial and middle layers were cultured for 13 days in serum-containing medium with or without BAPN. Variations in tissue size, accumulation of proteoglycan and collagen (COL), and tensile mechanical properties were assessed.

Results: The inclusion of serum resulted in expansive tissue growth, stimulation of proteoglycan and COL deposition, and a diminution of tensile integrity. Supplementation of medium with BAPN accentuated this phenotype in terms of a further increase in tissue size in explants from the superficial layer and further diminution of tensile integrity, without affecting the contents of proteoglycan and COL in explants from both the superficial and middle layers.

Conclusion: COL crosslinking is a major factor in modulating the phenotype of cartilage growth and the associated balance between proteoglycan content and integrity of the COL network.

Key words: Articular cartilage, Growth and remodeling, Cartilage matrix, Glycosaminoglycan, Collagen crosslinks, β -Aminopropionitrile.