

The role of primary cilia in degenerative spondyloarthritis

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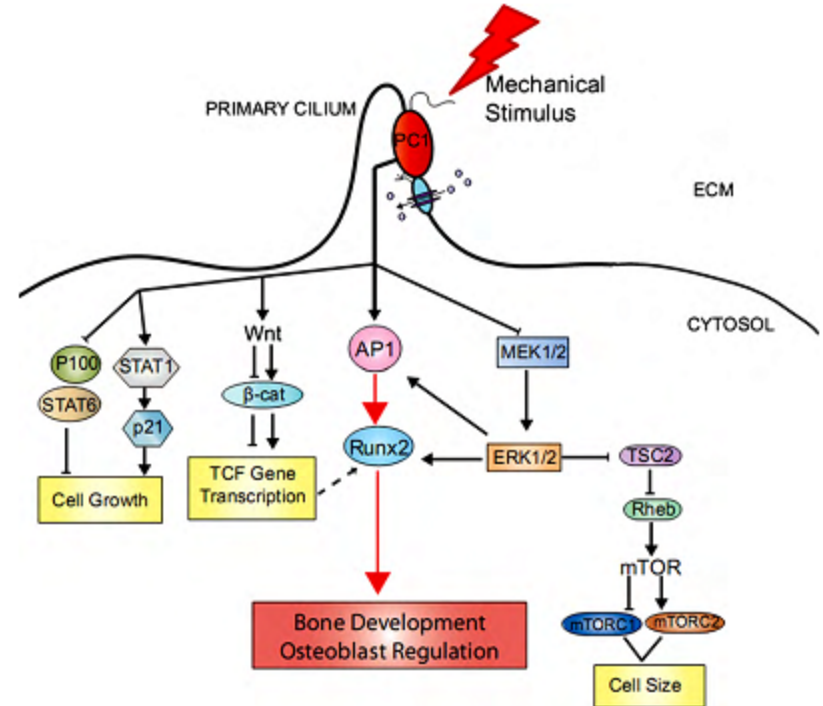
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Introduction

Primary cilia

- In normal articular cartilage, they are believed to function as antennas to:
 - Sense the biomechanical environment
 - Regulate the secretion of extracellular matrix (ECM) components
 - Maintain cellular position
 - Contribute to tissue anisotropy during joint development



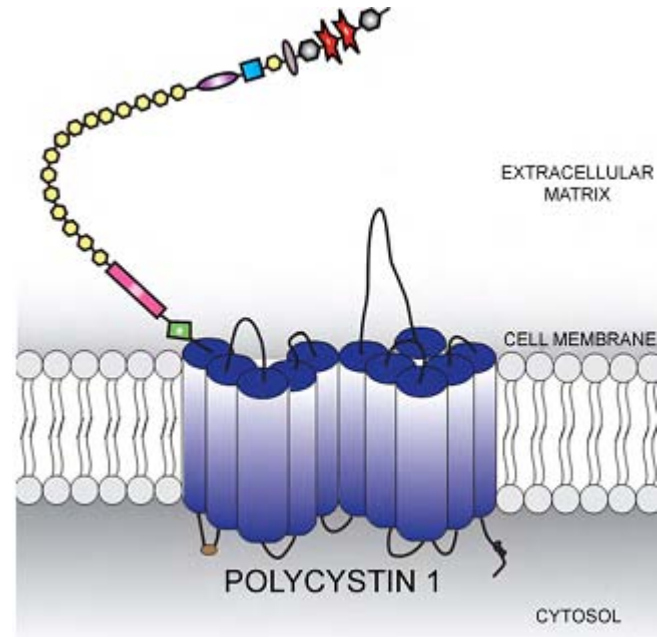
Dalagiorgou G, Basdra EK, Papavassiliou AG.
Polycystin-1: function as a mechanosensor. *Int J Biochem Cell Biol.* 2010 Oct;42(10):1610-3

Introduction

Polycystins located in primary cilia

- Major mechanosensory molecules
 - Affect cellular proliferation, differentiation and apoptosis

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Aim

- Investigate the expression of polycystin-1 in articular chondrocytes from patients with degenerative spondyloarthritis compared to controls
- Associate them with the disease state



Methods

- Facet joints were harvested en bloc
- 17 patients (5 males and 12 females, mean age 53.7 years) who were subjected to spinal surgery
- Between October 2009 and September 2010



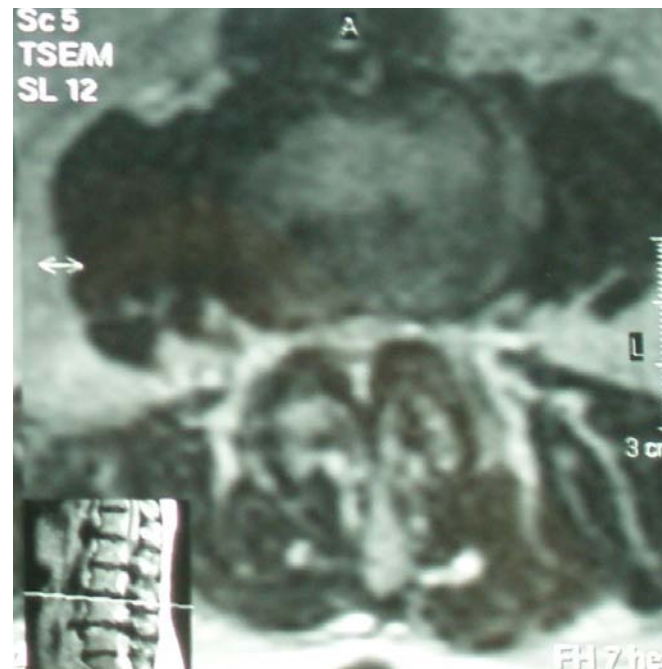
Methods

- 13 patients with degenerative lumbar spinal stenosis (4 men and 9 women, mean age 63.2 years)
 - Laminectomy and posterior stabilization
- 4 patients (1 male and 3 females, mean age 22.8 years) without radiographic evidence of degenerative spondyloarthropathy
 - Posterior stabilization due to scoliosis (n=3) or trauma (n=1)
 - Controls



Methods

- Removal of all soft tissue attachments
- Articular cartilage and subchondral bone were preserved into formalin solution
- Polycystin-1 expression was evaluated using immunohistochemistry



Results

- Arthritic facet joints
 - Increased expression of polycystin-1 (80%)
 - Chondrocytes of the articular cartilage
 - Subchondral bone
 - Endothelial cells



Results

- Normal cartilage:
 - Polycystin-1 immunostaining was very low (5%, $p < 0.05$)



Conclusions

- This is the first study attempt to investigate the presence of polycystin-1 in articular chondrocytes of degenerated cartilage
- Its role most likely associates with marked changes in the mechanical properties of ECM and of cartilage microenvironment that characterize degenerative arthritis



Conclusions

- Further studies focused on the molecular mechanisms underpinning polycystin-1 function at the onset and pathophysiology of spondyloarthritis are in progress

