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## Astroglial NF- $\kappa$ B activation in chronic knee osteoarthritic pain

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Clinical management of chronic joint pain evoked by osteoarthritis is a real challenge due to our limited understanding of the cellular mechanisms that initiate and develop chronic pain. It has been increasingly recognized that glial cells, such as microglia and astrocytes in the central nervous system play an important role in the development and maintenance of chronic pain. Notably, astrocytes make very close contacts with synapses and astrocyte reaction after nerve injury, arthritis, and tumor growth is more persistent than microglial reaction and displays a better correlation with chronic pain behaviors. The transcription factor nuclear factor kappa B (NF- $\kappa$ B) is a key regulator of inflammatory processes in reactive glial cells. The objectives were to determine whether inactivation of astroglial NF- $\kappa$ B leads to a reduction in pain behavior and inflammation after induction of knee joint osteoarthritis (OA), and joint pathology in an experimental OA model. We utilized a transgenic mouse model (GFAP-I $\kappa$ B $\alpha$ -dn in C57BL/6 genetic background) where the classical NF- $\kappa$ B pathway is inactivated by overexpression of a dominant negative (dn) form of the inhibitor of kappa B (I $\kappa$ B $\alpha$ ) in glial fibrillary acidic protein (GFAP) expressing cells, which include astrocytes, schwann cells, and satellite cells of the dorsal root ganglion (DRG). Young adult mice (Tg and WT) were subjected to surgical OA induction by partial medial meniscectomy (PMM). Weekly behavioral pain responses were recorded, and glial activation, NF- $\kappa$ B and joint pathology were analyzed in DRGs and dorsal horns by histology and immunohistochemistry followed by quantification. Our data suggest that the inhibition of NF- $\kappa$ B signaling in astrocytes as a promising target for the development of therapeutic strategies for OA pain.

### Biography

Hee-Jeong Im Sampen is an internationally recognized orthopedic-related research scientist with over 100 peer-reviewed publications and is a Professor with a primary appointment in the Department of Biochemistry and joint appointments in the Departments of Internal Medicine (Rheumatology Section) and Orthopedic Surgery. She also holds an appointment at the Jesse Brown Veterans Affairs (VA) Medical Center as well as at the Department of Bioengineering, University of Illinois at Chicago (UIC). He is a recipient of various awards and honors such as the *ANRF Scholar Award*, *OARSI Investigator Award*, and *Kappa Delta Elizabeth Winston Lanier Award* from the Orthopedic Research Society (ORS).

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