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(71) Applicant: **THE TRUSTEES OF THE UNIVERSITY OF PENNSYLVANIA** [US/US]; 3160 Chestnut Street, Suite 200, Philadelphia, PA 19104-6283 (US).

(72) Inventor: **BRIGHTON, Carl, T.**; 14 Flintshire Road, Malvern, PA 19355 (US).

(74) Agents: **CALDWELL, John, W.** et al.; Woodcock Washburn LLP., One Liberty Place - 46th Floor, Philadelphia, PA 19103 (US).

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(54) Title: RESOLUTION OF AGGRECAN GENE EXPRESSION USING SPECIFIC AND SELECTIVE ELECTRICAL AND ELECTROMAGNETIC SIGNALS

(57) Abstract: Methods and devices for the regulation of aggrecan gene expression in cartilage cells via the application of fields generated by specific and selective electric and electromagnetic signals in the treatment of diseased or injured articular cartilage. By gene expression is meant the up regulation or down regulation of the process whereby specific portions (genes) of the human genome (DNA) are transcribed into mRNA and subsequently translated into protein. Methods and devices are provided for the targeted treatment of injured or diseased cartilage tissue that include generating specific and selective electric and electromagnetic signals that generate fields optimized for aggrecan gene expression and exposing cartilage tissue to the fields generated by specific and selective signals so as to regulate aggrecan gene expression in such cartilage tissue. The resulting methods and devices are useful for the targeted treatment of osteoarthritis, rheumatoid arthritis, cartilage injury, and cartilage defects.