(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
22 April 2004 (22.04.2004)

PCT

(10) International Publication Number
WO 2004/033644 A3

(51) International Patent Classification[7]: A61H 1/00, A61F 7/00

(21) International Application Number: PCT/US2003/031793

(22) International Filing Date: 7 October 2003 (07.10.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/267,708 9 October 2002 (09.10.2002) US

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(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) Date of publication of the international search report:
23 September 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 2004/033644 A3

(54) Title: REGULATION OF TYPE II COLLAGEN GENE EXPRESSION USING SPECIFIC AND SELECTIVE ELECTRICAL AND ELECTROMAGNETIC SIGNALS

(57) Abstract: Methods and devices for the regulation of type II collagen gene expression in cartilage cells via the application of specific and selective 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 specific and selective fields optimized for type II collagen gene expression and exposing cartilage tissue to the specific and selective fields generated by specific and selective signals so as to regulate type II collagen 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.