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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
18 April 2013 (18.04.2013)

WIPO | PCT

(10) International Publication Number
WO 2013/053722 A1

(51) International Patent Classification:
C12N 5/077 (2010.01)

(21) International Application Number:
PCT/EP2012/069986

(22) International Filing Date:
10 October 2012 (10.10.2012)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
11184625.9 11 October 2011 (11.10.2011) EP

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *of inventorship (Rule 4.17(iv))*

Published:

— *with international search report (Art. 21(3))*

WO 2013/053722 A1

(54) **Title**: USES OF GROWTH AND DIFFERENTIATION FACTOR 8 (GDF-8)

(57) **Abstract**: The present invention relates to uses of growth and differentiation factor 8 (GDF-8) in vitro or in vivo for reducing the immunogenicity or risk of rejection of cells such as in particular mesenchymal stem cells (MSC), tissues or materials. The present invention further relates to methods for differentiating MSC in vitro or ex vivo into osteoprogemtors or osteoblastic cells or a cell population comprising osteoprogemtors and/or osteoblastic cells using FGF-2 and GDF-8. In addition, the present invention relates to osteoprogemtors or osteoblastic cells or a cell population comprising osteoprogemtors and/or osteoblastic cells obtainable by such methods and to the osteoprogemtors or osteoblastic cells or a cell population comprising osteoprogemtors and/or osteoblastic cells for use in the treatment of musculoskeletal diseases.