



(51) International Patent Classification:

C12N 5/0789 (2010.01) *C12N 5/077* (2010.01)
C12N 5/00 (2006.01) *C12N 5/071* (2010.01)
C12N 5/0775 (2010.01) *C12N 5/0797* (2010.01)

(21) International Application Number:

PCT/US2010/056340

(22) International Filing Date:

11 November 2010 (11.11.2010)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/260,607 12 November 2009 (12.11.2009) US

(71) Applicant (for all designated States except US): **VBI TECHNOLOGIES, LLC** [US/US]; 355 Pond Street, Uxbridge, MA 01569 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **VACANTI, Martin P.** [US/US]; 2220 Westchester Park #6, Manhattan, KS 66503 (US). **VACANTI, Charles A.** [US/US]; 355 Pond Street, Uxbridge, MA 01569 (US).

(74) Agents: **PABST, Patrea L.** et al.; Pabst Patent Group LLP, 1545 Peachtree Street, N.E., Suite 320, Atlanta, GA 30309 (US).

(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, 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, PE, PG, PH, PL, PT, RO, RS, RU, 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, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, 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:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

(54) Title: SUBPOPULATIONS OF SPORE-LIKE CELLS AND USES THEREOF

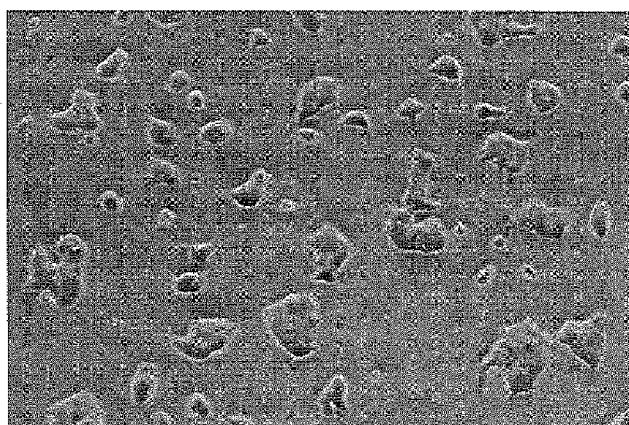


FIG 1

(57) Abstract: Subpopulations of spore-like cells expressing specific cell surface and gene expression markers are provided. In one embodiment, the cells express at least one cell surface or gene expression marker selected from the group consisting of Oct4, nanog, Zfp296, cripto, Gdf3, UtF1, Ecat1, Esg1, Sox2, Pax6, nestin, SCA-1, CD29, CD34, CD90, B1 integrin, cKit, SP-C, CC10, SF1, DAX1 and SCG10. Also provided are methods for purifying a subpopulation of spore-like cells of interest from a population of spore-like cells, and methods for inducing differentiation of the isolated spore-like cells into cells of endodermal, mesodermal or ectodermal origin. The spore-like cells can be used to generate cells originating from all three germ layers and can be used to treat a patient who has a deficiency of functional cells in any of a wide variety of tissues, including the retina, intestine, bladder, kidney, liver, lung, nervous system, or endocrine system.

