

(12) International Application Status Report

Received at International Bureau: 28 March 2011 (28.03.2011)

Information valid as of: 16 July 2012 (16.07.2012)

Report generated on: 04 September 2015 (04.09.2015)

(10) Publication number:

WO2011/113616

(43) Publication date:

22 September 2011 (22.09.2011)

(26) Publication language:

English (EN)

(21) Application Number:

PCT/EP2011/001392

(22) Filing Date:

21 March 2011 (21.03.2011)

(25) Filing language:

English (EN)

(31) Priority number(s):

105017 (PT)

(31) Priority date(s):

19 March 2010 (19.03.2010)

(31) Priority status:

Priority document received (in compliance with PCT Rule 17.1)

(51) International Patent Classification:

A61K 49/18 (2006.01); **A61K 9/107** (2006.01); **A61P 35/00** (2006.01); **B82Y 5/00** (2011.01)

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(54) Title (EN): A NANOPARTICLE COMPRISING A MICELLE FORMED BY AN AMPHIPHILIC BLOCK-COPOLYMER AND ENCAPSULATING A GADOLINIUM COMPLEX

(54) Title (FR): NANOPARTICULE COMPRENANT UNE MICELLE FORMÉE PAR UN COPOLYMÈRE SÉQUENCÉ AMPHIPHILE ET ENCAPSULANT UN COMPLEXE DE GADOLINIUM

(57) Abstract:

(EN): The present invention relates to a nanoparticle comprising a micelle formed by an amphiphilic block-copolymer and an agent encapsulated within said micelle. The present invention also relates to a composition comprising such nanoparticle and to the use of such nanoparticle and/or of such composition. More particularly, in one embodiment, the invention describes a new class of polymeric nanoparticles as smart T1 contrast agent for MR imaging for breast cancer early detection. These nanoparticles contrast agents have the capability to remain switched off during circulation and then switch on their imaging capacity upon arrival at the target sites (tissue of interest). These smart nanoparticles contrast agent are self-assembled from pH sensitive amphiphilic polymer, loaded with Gadolinium (Gd^{3+}) complex based T1 agent and then fitted with targeting biomolecules such as antibody, small molecules or DNA to increase its specificity toward the target of interest.

(FR): L'invention concerne une nanoparticule comprenant une micelle formée par un copolymère séquencé et un agent encapsulé à l'intérieur de ladite micelle. L'invention concerne également une composition comprenant ladite nanoparticule et l'utilisation de cette nanoparticule et/ou de cette composition. Dans un mode de réalisation, l'invention concerne plus particulièrement une nouvelle classe de nanoparticules polymères, en tant qu'agent de contraste intelligent T1 pour imagerie par résonance magnétique permettant la détection précoce d'un cancer du sein. Ces agents de contraste nanoparticulaires présentent la capacité de rester inactif pendant la circulation, puis activent leur capacité d'imagerie lors de leur arrivée sur des sites cibles (tissus d'intérêt). Ces agents de contraste nanoparticulaires intelligents sont auto-assemblés à partir d'un polymère amphiphile sensible au pH, chargés d'un agent T1 à base de complexe de gadolinium (Gd^{3+}) et comprenant des biomolécules de ciblage telles qu'un anticorps, de petites molécules ou un ADN pour augmenter sa spécificité envers la cible d'intérêt.

International search report:

Received at International Bureau: 11 July 2011 (11.07.2011) [EP]

International Report on Patentability (IPRP) Chapter II of the PCT:

Not available

(81) Designated States:

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

European Patent Office (EPO) : 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

African Intellectual Property Organization (OAPI) : BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

African Regional Intellectual Property Organization (ARIPO) : BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW

Eurasian Patent Organization (EAPO) : AM, AZ, BY, KG, KZ, MD, RU, TJ, TM