

Title (en)

APPLYING MECHANICAL FORCE BY REMOTE-CONTROLLED ROTATION

Title (de)

ANWENDUNG VON MECHANISCHER KRAFT DURCH FERNGESTEUERTE ROTATION

Title (fr)

APPLICATION D'UNE FORCE MÉCANIQUE PAR ROTATION COMMANDÉE À DISTANCE

Publication

EP 3113760 A4 20170823 (EN)

Application

EP 15759285 A 20150304

Priority

- US 201461947830 P 20140304
- US 2015018746 W 20150304

Abstract (en)

[origin: WO2015134620A1] Dynamic magnetic field (DMF) treatment to direct movement, and specifically rotation, of magnetic particles associated with a target structure, so that mechanical force is applied to the target structure. DMF treatment directs rotation about the axis in individual magnetic particles (e.g., superparamagnetic nanoparticles), effecting permeabilization and/or other disruption of membranes (e.g., cell membranes and/or intracellular membranes). Cell death is remotely induced by application of mechanical force through rotational movement of magnetic particles (specifically superparamagnetic iron oxide nanoparticles, "SPIONs") exposed to DMF treatment. Particles were specifically targeted to lysosomal membrane structures, and were individually induced through application of DMF treatment to rotate about their axes. The resulting mechanical force disrupted (e.g., permeabilized) the lysosomal membranes, releasing lysosomal enzymes and triggering apoptosis, all without heating the particles (or their surroundings).

IPC 8 full level

A61K 9/14 (2006.01); **A61N 2/06** (2006.01); **B82Y 30/00** (2011.01); **C07K 16/30** (2006.01)

CPC (source: EP)

A61K 9/0009 (2013.01); **A61K 41/0028** (2013.01); **A61K 47/6849** (2017.07); **C07K 16/2896** (2013.01); **B82Y 5/00** (2013.01); **B82Y 30/00** (2013.01); **C07K 2317/73** (2013.01); **C07K 2317/77** (2013.01)

Citation (search report)

- [XD] DE 102005030986 A1 20070111 - STETTER ERNST [DE]
- [X] EP 2671613 A2 20131211 - UNIV KOREA RES & BUS FOUND [KR]
- [XI] ZHANG ENMING ET AL: "Alternating Magnetic Fields Trigger Apoptosis by Destruction of Lysosomes with LAMP1-Targeted Nanoparticles", BIOPHYSICAL JOURNAL, vol. 100, no. 3, Suppl. 1, February 2011 (2011-02-01), & 55TH ANNUAL MEETING OF THE BIOPHYSICAL-SOCIETY; BALTIMORE, MD, USA; MARCH 05 -09, 2011, pages 472, XP009194837, ISSN: 1542-0086
- [XP] ZHANG ENMING ET AL: "Dynamic magnetic fields remote-control apoptosis via nanoparticle rotation.", ACS NANO 22 APR 2014, vol. 8, no. 4, 5 March 2014 (2014-03-05), pages 3192 - 3201, XP002771688, ISSN: 1936-086X
- See references of WO 2015134620A1

Designated contracting state (EPC)

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