Title (en)

BIOMATERIAL COMPRISING POLY(TRIMETHYLENE CARBONATE-CO-E-CAPROLACTONE) FOR PROMOTING AXONALL GROWTH AND NEURONAL REGENERATION

Title (de)

BIOMATERIAL MIT POLY(TRIMETHYLEN)-CARBONAT-CO-E-CAPROLACTON ZUR FÖRDERUNG DES AXONALL-WACHSTUMS UND DER NEURONALEN REGENERATION

Title (fr)

BIOMATÉRIAU COMPRENANT DU POLY(CARBONATE DE TRIMÉTHYLÈNE-CO- -CAPROLACTONE) FAVORISANT LA CROISSANCE AXONALE ET LA RÉGÉNÉRATION NEURONALE

Publication

EP 2948155 A1 20151202 (EN)

Application

EP 14710658 A 20140128

Priority

- GB 201301461 A 20130128
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Abstract (en)

[origin: WO2014116132A1] Mammalian central nervous system (CNS) neurons do not regenerate after injury due to the inhibitory environment formed by the glial scar, largely constituted by myelin debris. The use of biomaterials to bridge the lesion area and the creation of an environment favoring axonal regeneration is an appealing approach, currently under investigation. This work aimed at assessing the suitability of three candidate polymers - poly(?-caprolactone), poly(trimethylene carbonate-co- ?-caprolactone) (P(TMC-CL)) (11:89 mol%) and poly(trimethylene carbonate) - with the final goal of using these materials in medicine, namely in the development of conduits to promote spinal cord regeneration. Cortical neurons cultured on P(TMC-CL) in the presence of myelin were able to tame myelin inhibition in comparison with the control condition (glass substrate). This effect was found to be mediated by the glycogen synthase kinase 3p (GSK3p) signaling pathway with impact on the collapsin response mediator protein 4 (CRMP4), suggesting that nanomechanical properties were implicated in this process. The obtained results indicate P(TMC-CL) as a promising material for CNS regenerative applications as it promotes axonal growth, taming myelin inhibition.

IPC 8 full level

A61K 31/765 (2006.01); **A61K 31/198** (2006.01); **A61L 27/58** (2006.01); **A61P 25/00** (2006.01)

CPC (source: EP)

A61K 31/198 (2013.01); **A61K 31/765** (2013.01); **A61L 27/18** (2013.01); **A61L 27/34** (2013.01); **A61L 27/54** (2013.01); **A61L 31/06** (2013.01); **A61L 31/10** (2013.01); **A61L 31/16** (2013.01); **A61P 25/00** (2017.12); A61L 2300/252 (2013.01); A61L 2300/412 (2013.01); A61L 2430/32 (2013.01); Y02A 50/30 (2017.12)

C-Set (source: EP)

1. **A61L 27/18** + **C08L 67/04**
2. **A61L 31/06** + **C08L 67/04**
3. **A61L 31/10** + **C08L 89/00**
4. **A61L 27/34** + **C08L 89/00**

Citation (search report)

See references of WO 2014116132A1

Citation (examination)

- PÊGO AP1 ET AL: "Copolymers of trimethylene carbonate and epsilon-caprolactone for porous nerve guides: synthesis and properties", JOURNAL OF BIOMATERIALS SCIENCE. POLYMER EDIT, VSP, UTRECHT, NL, vol. 12, no. 1, 1 January 2001 (2001-01-01), pages 35 - 53, XP009177422, ISSN: 0920-5063, DOI: 10.1163/156856201744434
- LAURIANNE TIMBART ET AL: "Tissue Response to, and Degradation Rate of, Photocrosslinked Trimethylene Carbonate-Based Elastomers Following Intramuscular Implantation", MATERIALS, vol. 3, no. 2, 11 February 2010 (2010-02-11), pages 1156 - 1171, XP055435647, DOI: 10.3390/ma3021156

Designated contracting state (EPC)

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