



(12) Translation of
European patent specification

(11) NO/EP 3863647 B1

NORWAY

(19) NO

(51) Int Cl.

A61K 31/737 (2006.01)

A61P 19/08 (2006.01)

A61K 31/727 (2006.01)

A61P 19/10 (2006.01)

A61P 19/00 (2006.01)

A61P 29/00 (2006.01)

A61P 19/02 (2006.01)

Norwegian Industrial Property Office

(45)	Translation Published	2024.04.29
(80)	Date of The European Patent Office Publication of the Granted Patent	2024.02.14
(86)	European Application Nr.	19871048.5
(86)	European Filing Date	2019.10.10
(87)	The European Application's Publication Date	2021.08.18
(30)	Priority	2018.10.10, AU, 2018903820 2019.02.04, AU, 2019900326 2019.09.24, AU, 2019903556
(84)	Designated Contracting States:	AL ; AT ; BE ; BG ; CH ; CY ; CZ ; DE ; DK ; EE ; ES ; FI ; FR ; GB ; GR ; HR ; HU ; IE ; IS ; IT ; LI ; LT ; LU ; LV ; MC ; MK ; MT ; NL ; NO ; PL ; PT ; RO ; RS ; SE ; SI ; SK ; SM ; TR
(73)	Proprietor	Paradigm Biopharmaceuticals Limited, Level 15, 500 Collins Street, Melbourne VIC 3000, Australia
(72)	Inventor	RENNIE, Paul, 10 Simcock Street, West Beach, South Australia 5024, Australia KRISHNAN, Ravi, 63 Battams Road, Royston Park, South Australia 5070, Australia
(74)	Agent or Attorney	PLOUGMANN VINGTOFT, C. J. Hambros plass 2, 0164 OSLO, Norge

(54) Title **TREATMENT OF MALIGNANT BONE PAIN WITH PENTOSAN POLYSULFATE**

(56) References
Cited:

US-B2- 9 101 650

VINAYAK KUMAR ET AL: "NGF – the TrkA to successful pain treatment", JOURNAL OF PAIN RESEARCH, 1 August 2012 (2012-08-01), page 279, XP055249637, DOI: 10.2147/JPR.S33408

HWANG P et al.: "Efficacy of pentosan polysulfate in the treatment of interstitial cystitis: a meta-analysis", Urology, vol. 50, no. 1, July 1997 (1997-07), pages 39-43, XP001036819, DOI: 10.1016/S0090-4295(97)00110-6

GHOSH P et al.: "Effects of pentosan polysulfate in osteoarthritis of the knee: A randomized, double-blind, placebo-controlled pilot study", Curr Ther Res, vol. 66, no. 6, November 2005 (2005-11), pages 552-71, XP005303372, DOI: 10.1016/j.curtheres.2005.12.012

SAMPSON MJ et al.: "Improved clinical outcome measures of knee pain and function with concurrent resolution of subchondral Bone Marrow Edema Lesion and joint effusion in an osteoarthritic patient following Pentosan Polysulphate Sodium treatment: a case report", BMC Musculoskelet Disord, vol. 18, no. 1, 12 September 2017 (2017-09-12), page 396, XP055572039,

SEVCIK M A ET AL: "Anti-NGF therapy profoundly reduces bone cancer pain and the accompanying increase in markers of peripheral and central sensitization", PAIN, ELSEVIER SCIENCE PUBLISHERS, AMSTERDAM, NL, vol. 115, no. 1-2, 1 May 2005 (2005-05-01) , pages 128-141, XP004844690, ISSN: 0304-3959, DOI: 10.1016/J.PAIN.2005.02.022

MCCAFFREY et al.: "NGF blockade at early times during bone cancer development attenuates bone destruction and increases limb use", *Cancer Res.*, vol. 74, no. 23, 1 December 2014 (2014-12-01), pages 7014-23, XP055701677,

JIANG YH et al.: "Decrease of urinary nerve growth factor but not brain-derived neurotrophic factor in patients with interstitial cystitis/bladder pain syndrome treated with hyaluronic acid", *PLoS One*, vol. 9, no. 3, 10 March 2014 (2014-03-10), XP055701682,

MCMAHON SB: "NGF as a mediator of inflammatory pain", *Philos Trans R Soc Lond B Biol Sci*, vol. 351, no. 1338, 29 March 1996 (1996-03-29), pages 431-40, XP000980634,

KUMAR V et al.: "NGF- the tikA to successful pain treatment", *J Pain Res*, vol. 5, 2012, pages 279-87, XP055249637,

Hsin-Tzu Liu ET AL: "Urinary nerve growth factor level is increased in patients with interstitial cystitis/bladder pain syndrome and decreased in responders to treatment", *BJU International*, vol. 104, no. 10, 1 November 2009 (2009-11-01), pages 1476-1481, XP055701672, Hoboken, USA ISSN: 1464-4096, DOI: 10.1111/j.1464-410X.2009.08675.x

MATTHEW J. SAMPSON ET AL: "Improved clinical outcome measures of knee pain and function with concurrent resolution of subchondral Bone Marrow Edema Lesion and joint effusion in an osteoarthritic patient following Pentosan Polysulphate Sodium treatment: a case report", *BMC MUSCULOSKELETAL DISORDERS*, vol. 18, no. 1, 12 September 2017 (2017-09-12), pages 1-5, XP055572039, DOI: 10.1186/s12891-017-1754-3

LIU HT et al.: "Urinary nerve growth factor level is increased in patients with interstitial cystitis/bladder pain syndrome and decreased in responders to treatment", *BJU Int*, vol. 104, no. 10, November 2009 (2009-11), pages 1476-81, XP055701672,

Enclosed is a translation of the patent claims in Norwegian. Please note that as per the Norwegian Patents Acts, section 66i the patent will receive protection in Norway only as far as there is agreement between the translation and the language of the application/patent granted at the EPO. In matters concerning the validity of the patent, language of the application/patent granted at the EPO will be used as the basis for the decision. The patent documents published by the EPO are available through Espacenet (<http://worldwide.espacenet.com>) or via the search engine on our website here: <https://search.patentstyret.no/>

Patentkrav

- 1.** Sammensetning omfattende pentosanpolysulfat eller et akseptabelt salt derav for anvendelse i behandlingen av ondartet beinsmerte mediert av nervevekstfaktor (NGF) eller pro-nervevekstfaktor (pro-NGF) i et pattedyr, hvori sammensetningen administreres av intramuskulære (IM) eller subkutane (SC) ruter, en intraventrikulær rute, intracisternal rute eller intratekal rute, intravenøst (IV), intraartikulært (IA), periartikulært, topisk eller via stikkpiller.
- 2.** Sammensetningen for anvendelse ifølge krav 1, hvori pentosanpolysulfatet (PPS) velges fra gruppen som består av: natriumsaltet av pentosanpolysulfat (NaPPS), magnesiumsaltet av pentosanpolysulfat (MgPPS), kalsiumsaltet av pentosanpolysulfat (CaPPS), og sinksaltet av pentosanpolysulfat (ZnPPS), fortrinnsvis natriumpentosanpolysulfat (NaPPS).
- 3.** Sammensetningen for anvendelse ifølge et hvilket som helst av kravene 1 til 2, hvori pentosanpolysulfatet eller det akseptable saltet derav administreres til pattedyret i en effektiv mengde på omtrent 1 mg/kg til omtrent 2 mg/kg av pattedyret per dose.
- 4.** Sammensetningen for anvendelse ifølge krav 3, hvori sammensetningen doseres til pattedyret én gang daglig, to ganger ukentlig eller tre ganger ukentlig.
- 5.** Sammensetningen for anvendelse ifølge krav 4, hvori den totale dosen av administrert pentosanpolysulfat er omtrent 200 til 4000 mg.
- 6.** Sammensetningen for anvendelse ifølge et hvilket som helst av krav 1 til 2, hvori pentosanpolysulfatet eller det akseptable saltet derav administreres til pattedyret i en effektiv mengde i området på omtrent 10 ng til omtrent 1000 ng.

7. Sammensetningen for anvendelse ifølge et hvilket som helst av krav 1 til 2, hvori pentosanpolysulfatet eller det akseptable saltet derav administreres til pattedyret i en effektiv mengde i området på omtrent 1 mg til omtrent 25 mg.