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Born 1970



Summary

Thomas Graven-Nielsen received a M.Sc.EE degree within Biomedical Engineering from Aalborg University, Denmark in 1994 and acquired his PhD within Biomedical Science and Engineering in 1997 (Aalborg University). In 2006 he obtained a Doctoral degree in Medical Science (dr.med, Copenhagen University). He is Director at Center for Neuroplasticity and Pain (CNAP), SMI, Department of Health Science and Technology, Aalborg University, Denmark (since 2015), and Full Professor in Pain Neuroscience since 2008. The Danish National Research Foundation funds CNAP. Adjunct Professor at University at Western Sydney, Australia (since 2015), and Adjunct Professor at Curtin University of Technology, Perth, Australia (since 2004).

The research focuses on translational studies of musculoskeletal pain bridging the gap between basic animal findings and clinical manifestations of pain. The scope is to identify and modulate key features of human pain neuroplasticity leading to prevention of maladaptive neuroplasticity and promote advantageous neuroplasticity. Development of pain models, biomarkers, and assessment technologies are key biomedical tools for the translational studies. The core areas are muscle pain, joint pain, referred pain, localised and widespread deep-tissue hyperalgesia, pharmacological screening, and electrophysiological techniques to assess muscle pain physiology and neuroplasticity. He has published 300+ papers and reviews (260+ peer-reviewed, H-factor: 55) and received several awards. He reviews papers on a regular basis for high ranked journals, has presented as keynote speaker at several international conferences, and organised scientific workshops and symposia at international meetings. More than 10 national and international collaborations on translational pain research have been established including research groups in Sweden, UK, Japan, USA and Australia.

Qualifications (education and academic degrees)

1994	M.Sc.EE degree within Biomedical Engineering from Aalborg University
1997	Ph.D. within Biomedical Science and Engineering from Aalborg University
1999	University pedagogy (pædagogikum), Aalborg University
2006	dr.med., University of Copenhagen
2009-2010	Research management training (Copenhagen Business School)

Current and previous faculty positions

1997-1999	Assistant Professor, Center for Sensory-Motor Interaction (SMI), Department of Health Science and Technology, Aalborg University
1999-2007	Associate Professor, Center for Sensory-Motor Interaction (SMI), Department of Health Science and Technology, Aalborg University
2001-2004	Adjunct Associate Professor at Curtin University of Technology, Perth, Australia
2004-	Adjunct Professor at Curtin University of Technology, Perth, Australia
2006-	Head of the Doctoral School in Medicine, Biomedical Science and Technology, Faculty of Medicine, Aalborg University (110+ students enrolled)
2008-	Head of the Pain and Motor System Research Group (12 scientists), Center for Sensory-Motor Interaction (SMI), Aalborg University
2008-	Full Professor in Pain Neuroscience, Center for Sensory-Motor Interaction (SMI), Aalborg University
2010-	Deputy Head of Department (Research), Department of Health Science and Technology, Faculty of Medicine, Aalborg University
2015-:	Director, Center for Neuroplasticity and Pain (CNAP), SMI, Department of Health Science and Technology, Aalborg University
2015-:	Adjunct Professor at University of Western Sydney, Australia

Total scientific production

- 290+ scientific peer-reviewed papers (30% in Top-15% ranked journals within the field; 45% as first or senior author)
- Citations in total: 11000+ (Scopus, May 2019)
- H-factor for all scientific papers: 58 (Scopus, May 2019)
- Number of book chapters, proceedings and reviews: 55+
- Number of invited international lectures: 90+
- Monographs in total: 2
- Lead editor on 2 books
- Other (e.g., abstracts, proceedings) in total: 280+
- 3 patents

Research training

Extensive experience with Ph.D.-training including supervision/co-supervision of 17 conferred Ph.D. degrees and 5 on-going Ph.D. students. Chair or opponent in 25 Ph.D. assessment committees. Chair of one higher doctorate degree (dr.scient). Often served as international Ph.D. opponent at, e.g. University of Witwatersrand (South Africa), Umeå University (Sweden), Gent University (Belgium), University of Twente (The Netherlands), and University of Western Sydney (Australia). Completed supervision of 2 post-docs. Head of the Interantional Doctoral School (150+ students enrolled) which has graduated more than 150 Ph.D. students over the last 15 years.

Presentations

Frequently (80+) invited speaker to present on biomedical engineering assessment technologies and basic mechanisms in musculoskeletal pain. Presented as keynote speaker at several international conferences and given numerous symposium presentations at national and international meetings. Moreover, has organised several scientific workshops and symposia at international meetings (e.g. International Association for the Study of Pain (IASP); European Federation of IASP Chapters). Member of scientific programme committee for international meetings. Chaired and hosted a 3-days international symposium with strong scientific impact.

Organisation of international conferences

- Chairman or co-chair for 3 Annual International Symposia on Translational Neurobiology of the Pain System (Aalborg, Denmark, two days meetings in 2009, 2010, and 2012)
- Chairman, the IASP Research Symposium: Fundamentals of Musculoskeletal Pain, 7-9 May 2007 (200 participants from Europe and 18 countries outside Europe)
- Organised several workshops at international conferences (e.g. IASP, EFIC, and the American Pain Society. Typically 200-400 participants).
- Scientific Organizing Committee, member, World MYOPAIN, Toledo, Spain, 2010
- Scientific Organizing Committee, member, the Scandinavian Association for the Study of Pain, Annual Meeting, Aalborg, Denmark, 4-7 April 2002.

Funding

Applied for and administrated grants of more than EURO 3,000,000. Co-investigator on several national and international grants from e.g. NHMRC (Australia), NIH (USA), and EU (FP6). Specific grants to pursue the international collaborations have been obtained (e.g. The Danish Agency for Science, Technology and Innovation).

International Prizes/Awards/Society memberships

The EFIC Grünenthal Grant (2007), the Queen Ingrid's Research Award (2003), The SASP Young Investigator award (2002), and other awards. Scan|Design IASP Collaborative Research Grant (2005, 2007 and 2011). The Research Award (The Danish Disability foundation, 2013). Member of The International Association for the Study of Pain, Society for Neuroscience, The American Pain Society, and The Danish Pain Society.

Editorial and scientific commitments

- Reviews papers on a regular basis for high-ranked journals (15+ per year); e.g. Pain, J Neuroscience, NeuroImage, J Pain, Eur J Pain, J Neurophysiol, J Physiol (all IP>4).
- Lead editor of one book (IASP Press).
- Editorial board member of an international peer-reviewed journal (Scand J Pain).
- Deputy-chair and board member of the Danish IASP (International Association for the Study of Pain) chapter.
- President of the Special Interest Group on Musculoskeletal pain (approx 500 members), IASP.
- Councillor in The European Federation of Chapters of the IASP.
- Served as chair and member of various task force committees in the IASP.

Peer reviewed journal articles

1. Arendt-Nielsen L, Graven-Nielsen T, Svarrer H, Svensson P. 1996. The influence of low back pain on muscle activity and coordination during gait: a clinical and experimental study. *Pain*. 64(2):231-240.
2. Arendt-Nielsen L, Svensson P, Graven-Nielsen T. 1997. How to assess muscle pain experimentally and clinically. *European Journal of Pain*. 1:64-65.
3. Arendt-Nielsen L, Graven-Nielsen T, Svensson P, Jensen TS. 1997. Temporal summation in muscles and referred pain areas: an experimental human study. *Muscle & Nerve*. 20:1311-1313.
4. Graven-Nielsen T, Svensson P, Arendt-Nielsen L. 1997. Effects of experimental muscle pain on muscle activity and co-ordination during static and dynamic motor function. *Electroencephalography and Clinical Neurophysiology*. 105:156-164.
5. Graven-Nielsen T, Arendt-Nielsen L, Svensson P, Jensen TS. 1997. Experimental muscle pain: a quantitative study of local and referred pain in humans following injection of hypertonic saline. *Journal of Musculoskeletal Pain*. 5(1):49-69.
6. Graven-Nielsen T, McArdle A, Phoenix J, Arendt-Nielsen L, Jensen TS, Jackson MJ, Edwards RHT. 1997. In vivo model of muscle pain: quantification of intramuscular chemical, electrical and pressure changes associated with saline-induced muscle pain in humans. *Pain*. 69:137-143.
7. Graven-Nielsen T, Arendt-Nielsen L, Svensson P, Jensen TS. 1997. Quantification of local and referred muscle pain in humans after sequential i.m. injections of hypertonic saline. *Pain*. 69:111-117.
8. Graven-Nielsen T, Arendt-Nielsen L, Svensson P, Jensen TS. 1997. Stimulus-response functions in areas with experimentally induced referred muscle pain: a psychophysical study. *Brain Research*. 744:121-128.
9. Laursen RJ, Graven-Nielsen T, Jensen TS, Arendt-Nielsen L. 1997. Quantification of local and referred pain in humans induced by intramuscular electrical stimulation. *European Journal of Pain*. 1:105-113.
10. Laursen RJ, Graven-Nielsen T, Jensen TS, Arendt-Nielsen L. 1997. Referred pain is dependent on sensory input from the periphery: a psychophysical study. *European Journal of Pain*. 1(4):261-269.
11. Fenger-Grøn LS, Graven-Nielsen T, Arendt-Nielsen L, Svensson P, Stengaard-Pedersen K, Jensen TS. 1998. Muscular sensibility assessed by electrical stimulation and mechanical pressure. *Journal of Musculoskeletal Pain*. 6(4):33-44.
12. Graven-Nielsen T, Babenko V, Svensson P, Arendt-Nielsen L. 1998. Experimentally induced muscle pain induces hypoalgesia in heterotopic deep tissues, but not in homotopic deep tissues. *Brain Research*. 787(2):203-210.
13. Graven-Nielsen T, Fenger-Grøn LS, Svensson P, Steengaard-Pedersen K, Arendt-Nielsen L, Jensen TS. 1998. Quantification of deep and superficial sensibility in saline-induced muscle pain: a psychophysical study. *Somatosensory and Motor Research*. 15(1):46-53.
14. Svensson P, De Laat A, Graven-Nielsen T, Arendt-Nielsen L. 1998. Experimental jaw-muscle pain does not change heteronymous H-reflexes in the human temporalis muscle. *Experimental Brain Research*. 121(3):311-318.
15. Svensson P, Graven-Nielsen T, Matre DA, Arendt-Nielsen L. 1998. Experimental muscle pain does not cause long-lasting increases in resting EMG activity. *Muscle & Nerve*. 21:1382-1389.
16. Svensson P, Graven-Nielsen T, Arendt-Nielsen L. 1998. Mechanical hyperesthesia of human facial skin induced by tonic painful stimulation of jaw-muscles. *Pain*. 74(1):93-100.
17. Sörensen J, Graven-Nielsen T, Henrikson KG, Bengtsson M, Arendt-Nielsen L. 1998. Hyperexcitability in fibromyalgia. *Journal of Rheumatology*. 25(1):152-155.
18. Babenko V, Graven-Nielsen T, Svensson P, Drewes AM, Jensen TS, Arendt-Nielsen L. 1999. Experimental human muscle pain and muscular hyperalgesia induced by combinations of serotonin and bradykinin. *Pain*. 82:1-8.
19. Babenko V, Graven-Nielsen T, Svensson P, Drewes AM, Jensen TS, Arendt-Nielsen L. 1999. Experimental human muscle pain induced by intramuscular injections of bradykinin, serotonin, and substance P. *European Journal of Pain*. 3:93-102.
20. Johansen MK, Graven-Nielsen T, Olesen AS, Arendt-Nielsen L. 1999. Generalised muscular hyperalgesia in chronic whiplash syndrome. *Pain*. 83:229-234.
21. Laursen RJ, Graven-Nielsen T, Jensen TS, Arendt-Nielsen L. 1999. The effect of compression and regional anaesthetic block on referred pain intensity in humans. *Pain*. 80(1-2):257-263.
22. Laursen RJ, Graven-Nielsen T, Jensen TS, Arendt-Nielsen L. 1999. The effect of differential and complete nerve block on experimental muscle pain in humans. *Muscle & Nerve*. 22:1564-1570.
23. Svensson P, De Laat A, Graven-Nielsen T, Arendt-Nielsen L, Macaluso GM. 1999. Effect of clenching levels on heteronymous H-reflex in human temporalis muscle. *Experimental Brain Research*. 126:467-472. <https://doi.org/10.1007/s002210050754>
24. Svensson P, McMillan AS, Graven-Nielsen T, Wang K, Arendt-Nielsen L. 1999. Modulation of an inhibitory reflex in single motor units in human masseter by tonic painful stimulation. *Pain*. 83:441-446.
25. Andersen OK, Graven-Nielsen T, Matre DA, Arendt-Nielsen L, Schomburg ED. 2000. Interaction between cutaneous and muscle afferent activity in polysynaptic reflex pathways: a human experimental study. *Pain*. 84:29-36.

26. Babenko V, Svensson P, Graven-Nielsen T, Drewes AM, Jensen TS, Arendt-Nielsen L. 2000. Duration and distribution of experimental muscle hyperalgesia in humans following combined infusions of serotonin and bradykinin. *Brain Research*. 853(2):275-281.
27. Bajaj P, Graven-Nielsen T, Wright A, Davies II, Arendt-Nielsen L. 2000. Muscle hyperalgesia in postexercise muscle soreness assessed by single and repetitive ultrasound stimuli. *Journal of Pain*. 1(2):111-121.
28. Birch L, Graven-Nielsen T, Christensen H, Arendt-Nielsen L. 2000. Experimental muscle pain modulates muscle activity and work performance differently during high and low precision use of a computer mouse. *European Journal of Applied Physiology*. 83:492-498.
29. Birch L, Christensen H, Arendt-Nielsen L, Graven-Nielsen T, Søgaard K. 2000. The influence of experimental muscle pain on motor unit activity during low level contraction. *European Journal of Applied Physiology*. 83:200-206.
30. Graven-Nielsen T, Svensson P, Arendt-Nielsen L. 2000. Effect of muscle pain on motor control: a human experimental approach. *Advances in Physiotherapy*. 2:26-38.
31. Graven-Nielsen T, Kendall SA, Henriksson KG, Bengtsson M, Sørensen J, Johnson A, Gerdle B, Arendt-Nielsen L. 2000. Ketamine reduces muscle pain, temporal summation, and referred pain in fibromyalgia patients. *Pain*. 85:483-491.
32. Graven-Nielsen T, Svensson P, McMillan AS, Arendt-Nielsen L. 2000. Quantitative analysis of reflex inhibition in single motor units in human masseter muscle: effects of stimulus intensity. *Muscle & Nerve*. 23:259-266.
33. Sohn MK, Graven-Nielsen T, Arendt-Nielsen L, Svensson P. 2000. Inhibition of motor unit firing during experimental muscle pain in humans. *Muscle & Nerve*. 23(8):1219-1226.
34. Svensson P, Miles TS, Graven-Nielsen T, Arendt-Nielsen L. 2000. Modulation of stretch-evoked reflexes in single motor units in human masseter muscle by experimental pain. *Experimental Brain Research*. 132:65-71.
35. Bajaj P, Bajaj P, Graven-Nielsen T, Arendt-Nielsen L. 2001. Osteoarthritis and its association with muscle hyperalgesia: an experimental controlled study. *Pain*. 93(2):107-114.
36. Bajaj P, Graven-Nielsen T, Arendt-Nielsen L. 2001. Post-exercise muscle soreness after eccentric exercise: psychophysical effects and implications on mean arterial pressure. *Scandinavian Journal of Medicine & Science in Sports*. 11(5):266-273. <https://doi.org/10.1034/j.1600-0838.2001.110503.x>
37. Bajaj P, Bajaj P, Graven-Nielsen T, Arendt-Nielsen L. 2001. Trigger points in patients with lower limb osteoarthritis. *Journal of Musculoskeletal Pain*. 9(3):17-33.
38. Birch L, Arendt-Nielsen L, Graven-Nielsen T, Christensen H. 2001. An investigation of how acute muscle pain modulates performance during computer work with digitizer and puck. *Applied Ergonomics*. 32(3):281-286. [https://doi.org/10.1016/S0003-6870\(00\)00061-2](https://doi.org/10.1016/S0003-6870(00)00061-2)
39. Chang P, Arendt-Nielsen L, Graven-Nielsen T, Svensson P, Chen ACN. 2001. Different EEG topographic effects of painful and non-painful intramuscular stimulation in man. *Experimental Brain Research*. 141:195-203.
40. Chang P, Arendt-Nielsen L, Graven-Nielsen T, Svensson P, Chen ACN. 2001. Topographic effects of tonic cutaneous nociceptive stimulation on human electroencephalograph. *Neuroscience Letters*. 305(1):49-52.
41. Graven-Nielsen T, Mense S. 2001. The peripheral apparatus of muscle pain: evidence from animal and human studies. *The Clinical Journal of Pain*. 17:2-10.
42. Le Pera D, Graven-Nielsen T, Valeriani M, Oliviero A, Lazzaro VD, Tonali PA, Arendt-Nielsen L. 2001. Inhibition of motor system excitability at cortical and spinal level by tonic muscle pain. *Clinical Neurophysiology*. 112:1633-1641.
43. Macaluso GM, Svensson P, Graven-Nielsen T. 2001. Conditioning of heteronymous H-reflex in human temporalis muscle by stimulation of perioral afferents. *Experimental Brain Research*. 136(1):114-119.
44. McMillan AS, Graven-Nielsen T, Romaniello A, Svensson P. 2001. Motor potentials evoked by transcranial magnetic stimulation during isometric and dynamic masseter muscle contraction in humans. *Archives of Oral Biology*. 46(4):381-386.
45. Niddam DM, Graven-Nielsen T, Arendt-Nielsen L, Chen ACN. 2001. Non-painful and painful surface and intramuscular electrical stimulation at the thenar and hypothenar sites: differential cerebral dynamics of early to late latency SEPs. *Brain Topography*. 13(4):283-292.
46. Polianskis R, Graven-Nielsen T, Arendt-Nielsen L. 2001. Computer-controlled pneumatic pressure algometry: a new technique for quantitative sensory testing. *European Journal of Pain*. 5(3):267-277.
47. Svensson P, Graven-Nielsen T. 2001. Craniofacial muscle pain: review of mechanisms and clinical manifestations. *Journal of Orofacial Pain*. 15(2):117-145.
48. Arendt-Nielsen L, Graven-Nielsen T. 2002. Deep tissue hyperalgesia. *Journal of Musculoskeletal Pain*. 10(1/2):97-119.
49. Farina D, Arendt-Nielsen L, Merletti R, Graven-Nielsen T. 2002. Assessment of single motor unit conduction velocity during sustained contractions of the tibialis anterior muscle with advanced spike triggered averaging. *Journal of Neuroscience Methods*. 115(1):1-12.

50. Farina D, Madeleine P, Graven-Nielsen T, Merletti R, Arendt-Nielsen L. 2002. Standardising surface electromyogram recordings for assessment of activity and fatigue in the human upper trapezius muscle. *European Journal of Applied Physiology*. 86:469-478.
51. Graven-Nielsen T, Lund H, Arendt-Nielsen L, Danneskiold-Samsøe B, Bliddal H. 2002. Inhibition of maximal voluntary contraction force by experimental muscle pain: a centrally mediated mechanism. *Muscle & Nerve*. 26(5):708-712.
52. Graven-Nielsen T, Arendt-Nielsen L. 2002. Is there a relation between intramuscular hypoperfusion and chronic muscle pain?. *Journal of Pain*. 3(4):261-263.
53. Graven-Nielsen T, Gibson SJ, Laursen RJ, Svensson P, Arendt-Nielsen L. 2002. Opioid-insensitive hypoalgesia to mechanical stimuli at sites ipsilateral and contralateral to experimental muscle pain in human volunteers. *Experimental Brain Research*. 146:213-222.
54. Graven-Nielsen T, Arendt-Nielsen L. 2002. Peripheral and central sensitization in musculoskeletal pain disorders: an experimental approach. *Current Rheumatology Reports*. 4(4):313-321.
55. Graven-Nielsen T, Arendt-Nielsen L, Mense S. 2002. Thermosensitivity of muscle: high intensity thermal stimulation of muscle tissue induces pain in humans. *Journal of Physiology*. 540(2):647-656.
56. Polianskis R, Graven-Nielsen T, Arendt-Nielsen L. 2002. Modality-specific facilitation and adaptation to painful tonic stimulation in humans. *European Journal of Pain*. 6:475-484.
57. Polianskis R, Graven-Nielsen T, Arendt-Nielsen L. 2002. Pressure-pain function in desensitized and hypersensitized muscle and skin assessed by cuff algometry. *Journal of Pain*. 3(1):28-37.
58. Polianskis R, Graven-Nielsen T, Arendt-Nielsen L. 2002. Spatial and temporal aspects of deep tissue pain assessed by cuff algometry. *Pain*. 100:19-26.
59. Wright A, Graven-Nielsen T, Davies II, Arendt-Nielsen L. 2002. Temporal summation of pain from skin, muscle and joint following nociceptive ultrasonic stimulation in humans. *Experimental Brain Research*. 144(4):475-482.
60. Arendt-Nielsen L, Graven-Nielsen T. 2003. Central sensitization in fibromyalgia and other musculoskeletal disorders. *Current Pain and Headache Reports*. 7(5):355-361.
61. Arendt-Nielsen L, Mense S, Graven-Nielsen T. 2003. Messung von Muskelschmerz und Hyperalgesie: experimentelle und klinische Befunde. *Schmerz*. 17(6):445-449.
62. Cairns BE, Svensson P, Wang K, Hupfeld S, Graven-Nielsen T, Sessle BJ, Berde CB, Arendt-Nielsen L. 2003. Activation of peripheral NMDA receptors contributes to human pain and rat afferent discharges evoked by injection of glutamate into the masseter muscle. *Journal of Neurophysiology*. 90(4):2098-2105.
63. Chang P, Arendt-Nielsen L, Graven-Nielsen T, Chen ACN. 2003. Psychophysical and EEG responses to repeated experimental muscle pain in humans: pain intensity encodes EEG activity. *Brain Research Bulletin*. 59(6):533-543.
64. Eichenberger U, Giani C, Petersen-Felix S, Graven-Nielsen T, Arendt-Nielsen L, Curatolo M. 2003. Lumbar epidural fentanyl: segmental spread and effect on temporal summation and muscle pain. *British Journal of Anaesthesia*. 90(4):467-473.
65. Farina D, Arendt-Nielsen L, Merletti R, Indino B, Graven-Nielsen T. 2003. Selectivity of spatial filters for surface EMG detection from the tibialis anterior muscle. *IEEE Transactions on Biomedical Engineering*. 50(3):354-364.
66. Graven-Nielsen T, Jansson Y, Segerdahl M, Kristensen JD, Mense S, Arendt-Nielsen L, Sollevi A. 2003. Experimental pain by ischaemic contractions compared with pain by intramuscular infusions of adenosine and hypertonic saline. *European Journal of Pain*. 7(1):93-102. [https://doi.org/10.1016/S1090-3801\(02\)00069-1](https://doi.org/10.1016/S1090-3801(02)00069-1)
67. Graven-Nielsen T, Arendt-Nielsen L. 2003. Induction and assessment of muscle pain, referred pain, and muscular hyperalgesia. *Current Pain and Headache Reports*. 7:443-451.
68. Schulte H, Graven-Nielsen T, Sollevi A, Jansson Y, Arendt-Nielsen L, Segerdahl M. 2003. Pharmacological modulation of experimental phasic and tonic muscle pain by morphine, alfentanil and ketamine in healthy volunteers. *Acta Anaesthesiologica Scandinavica*. 47(8):1020-1030.
69. Slater H, Arendt-Nielsen L, Wright A, Graven-Nielsen T. 2003. Experimental deep tissue pain in wrist extensors: a model of lateral epicondylalgia. *European Journal of Pain*. 7(3):277-288.
70. Svensson P, Cairns BE, Wang K, Hu JW, Graven-Nielsen T, Arendt-Nielsen L, Sessle BJ. 2003. Glutamate-evoked pain and mechanical allodynia in the human masseter muscle. *Pain*. 101(3):221-227.
71. Chang P, Arendt-Nielsen L, Graven-Nielsen T, Svensson P, Chen ACN. 2004. Comparative EEG activation to skin pain and muscle pain induced by capsaicin injection. *International Journal of Psychophysiology*. 51(2):117-126.
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Book chapters

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Conference papers and abstracts

1. Sørensen LB, Gazerani P, Graven-Nielsen T. 2019. Increased muscle pain evoked by ischemic contractions in a nerve growth factor (NGF)-sensitized muscle. Abstract from 11th Congress of The European PAIN Federation EFIC, Valencia, Spain.
2. Petersen KK, Jensen MB, Graven-Nielsen T, Hauerslev LV, Arendt-Nielsen L, Rathleff MS. 2019. Temporal summation of pain and pain catastrophizing is associated with self-reported pain after 12 weeks: A prospective cohort study of patients with low back pain in general practice. Abstract from 11th Congress of The European PAIN Federation EFIC, Valencia, Spain.
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4. McPhee ME, Graven-Nielsen T. 2019. Local hypoalgesia to pressure and enhanced sequential conditioned pain modulation following fatiguing trunk extensor exercise. Abstract from 2019 Australian Pain Society Conference 39th Annual Scientific Meeting, Gold Coast, Australia.
5. Andreas AMZ, Arguissain F, Kleber B, Vuust P, Boudreau S, Flor H, Graven-Nielsen T. 2019. The effects of use-dependent neuroplasticity and chronic pain on somatosensory peripheral and cortical excitability. Abstract from 11th Congress of The European PAIN Federation EFIC, Valencia, Spain.
6. Zandalasini M, De Martino E, Arendt-Nielsen L, Graven-Nielsen T. 2018. Test-retest reliability of motor and sensory evoked potentials as well as pain sensitivity assessment in healthy volunteers. Abstract from 17th World Congress on Pain, IASP 2018, Boston, MA, United States.
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10. Sørensen LB, Boudreau S, Gazerani P, Graven-Nielsen T. 2018. Spatially distributed injections of low-dose nerve growth factor (NGF) induce enlarged areas of muscle pain and pronounced muscle hypersensitivity. Abstract from 17th World Congress on Pain, IASP 2018, Boston, MA, United States.
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12. Summers S, Chipchase L, Hirata RP, Graven-Nielsen T, Cavaleri R, Schabrun S. 2018. Motor cortex reorganisation is associated with the magnitude of motor variability in the transition to sustained muscle pain. Abstract from 17th World Congress on Pain, IASP 2018, Boston, MA, United States.
13. Poulsen JN, Graven-Nielsen T, Gazerani P. 2018. Bradykinin-2 receptor antagonist, HOE 140, prevents the development of delayed onset muscle soreness in female and male rats. Abstract from 17th World Congress on Pain, IASP 2018, Boston, MA, United States.
14. Nygård Kristensen H, Thomsen HH, Lundbye-Christensen S, Graven-Nielsen T, Sørensen EE. 2018. The pain experience in hospitalized children. The impact of hospital clowns on hospitalized children undergoing painful procedures. Abstract from Sygeplejesymposium, Aalborg, Denmark.
15. McPhee ME, Graven-Nielsen T. 2018. Temporal summation of pain and conditioned pain modulation across an episode of experimental low back pain. Abstract from 17th World Congress on Pain, IASP 2018, Boston, MA, United States.
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