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Motor Control

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Short presentation

I am interested in fundamental research questions to evaluate the effect of exercise and rehabilitation programs. Through animal models, studies on healthy subjects and patients, I together with my group aim to better understand the neural control of movement in health and disease.

Employment

Professor

Department of Neuroscience

København N

5 Jan 2009 → nu

Professor

Department of Nutrition, Exercise and Sports

København N

1 Oct 1999 → 31 Aug 2017

Professor, Head of Section

Neural Control of Movement

København N

1 Jan 2013 → 5 Jul 2016

Head of section, professor

Motor Control

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1 Jan 2013 → nu

Publications

Corticospinal control of normal and visually-guided gait in healthy older and younger adults

Spedden, M. E., Choi, J. T. L., Nielsen, J. B. & Geertsen, S. S., 7 Mar 2019, In : *Neurobiology of Aging*. 78, p. 29-41 13 p.

The development of functional and directed corticomuscular connectivity during tonic ankle muscle contraction across childhood and adolescence

Spedden, M. E., Jensen, P., Terkildsen, C. U., Jensen, N. J., Halliday, D. M., Lundbye-Jensen, J., Nielsen, J. B. & Geertsen, S. S., 25 Feb 2019, In : *NeuroImage*. 191, p. 350-360 11 p.

Are sensorimotor experiences the key for successful early intervention in infants with congenital brain lesion?

Ritterband-Rosenbaum, A., Justiniano, M. D., Nielsen, J. B. & Christensen, M. S., 12 Feb 2019, In : *Infant Behavior and Development*. 54, p. 133-139 7 p.

Systemic inflammatory markers in individuals with cerebral palsy

Pingel, J., Barber, L., Andersen, I. T., Von Walden, F., Wong, C., Døssing, S. & Nielsen, J. B., 23 Jan 2019, In : *European Journal of Inflammation*.

Using corticomuscular and intermuscular coherence to assess cortical contribution to ankle plantar flexor activity during gait

Jensen, P., Frisk, R., Spedden, M. E., Geertsen, S. S., Bouyer, L. J., Halliday, D. M. & Nielsen, J. B., 18 Jan 2019, In : *Journal of Motor Behavior*.

Chemical denervation using botulinum toxin increases Akt expression and reduces submaximal insulin-stimulated glucose transport in mouse muscle

Li, Z., Näslund-Koch, L., Henriquez Olguín, C., Knudsen, J. R., Li, J., Madsen, A. L. B., Ato, S., Wienecke, J., Ogasawara, R., Nielsen, J. B. & Jensen, T. E., Jan 2019, In : *Cellular Signalling*. 53, p. 224-233 10 p.

Sequence variants in muscle tissue-related genes may determine the severity of muscle contractures in cerebral palsy

Pingel, J., Andersen, J. D., Christiansen, S. L., Børsting, C., Morling, N., Lorentzen, J., Kirk, H., Doessing, S., Wong, C. & Nielsen, J. B., Jan 2019, In : *American Journal of Medical Genetics. Part B: Neuropsychiatric Genetics*. 180, 1, p. 12-24

Suboptimal nutrition and low physical activity are observed together with reduced plasma *brain-derived neurotrophic factor* (BDNF) concentration in children with severe cerebral palsy (CP)

Hansen, S. L., Lorentzen, J., Pedersen, L. T., Hendrich, F. L., Jorsal, M., Pingel, J., Nielsen, J. B. & Kiens, B., 2019, In : *Nutrients*. 11, 3, 16 p., 620.

On Denny-Brown's 'spastic dystonia' - What is it and what causes it?

Lorentzen, J., Pradines, M., Gracies, J-M. & Nielsen, J. B., Jan 2018, In : *Clinical Neurophysiology*. 129, 1, p. 89-94

Assessment of intersegmental coordination of rats during walking at different speeds - Application of continuous relative phase

Raffalt, P. C., Nielsen, L. R., Madsen, S., Højberg, L. M., Pingel, J., Nielsen, J. B., Alkjær, T. & Wienecke, J., 2018, In : *Journal of Biomechanics*. 73, p. 168-176 9 p.

Characterization of corticospinal activation of finger motor neurons during precision and power grip in humans

Svane, C., Forman, C. R., Nielsen, J. B. & Geertsen, S. S., 2018, In : *Experimental Brain Research*. 236, 3, p. 745-753 9 p.

Day-to-day reliability of gait characteristics in rats

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Impaired ability to suppress excitability of antagonist motoneurons at onset of dorsiflexion in adults with cerebral palsy

Geertsen, S. S., Kirk, H. & Nielsen, J. B., 2018, In : *Neural Plasticity*. 2018, 11 p., 1265143.

Impaired muscle growth precedes development of increased stiffness of the triceps surae musculotendinous unit in children with cerebral palsy

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Increased central common drive to ankle plantar flexor and dorsiflexor muscles during visually guided gait

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Microvascularization is not a limiting factor for exercise in adults with cerebral palsy

Andersen, I. T., Harrison, A., Broholm, R., Harder, A., Nielsen, J. B., Bülow, J. & Pingel, J., 2018, In : *Journal of Applied Physiology*. 125, 2, p. 536-544

Modulation of task-related cortical connectivity in the acute and subacute phase after stroke

Larsen, L. H., Zibrandtsen, I. C., Wienecke, T., Kjær, T. W., Langberg, H., Nielsen, J. B. & Christensen, M. S., 2018, In : *European Journal of Neuroscience*. 47, 8, p. 1024-1032 9 p.

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Injection of high dose botulinum-toxin A leads to impaired skeletal muscle function and damage of the fibrillar and non-fibrillar structures

Pingel, J., Nielsen, M. S., Lauridsen, T., Rix, K., Bech, M., Alkjaer, T., Andersen, I. T., Nielsen, J. B. & Feidenhans'l, R. K., 7 Nov 2017, In : *Scientific Reports*. 7, 14746.

Corticomuscular coherence in the acute and subacute phase after stroke

Larsen, L. H., Zibrandtsen, I. C., Wienecke, T., Kjaer, T. W., Christensen, M. S., Nielsen, J. B. & Langberg, H., Nov 2017, In : *Clinical neurophysiology : official journal of the International Federation of Clinical Neurophysiology*. 128, 11, p. 2217-2226 10 p.

To be active through indoor-climbing: an exploratory feasibility study in a group of children with cerebral palsy and typically developing children

Schram Christensen, M., Jensen, T., Voigt, C. B., Nielsen, J. B. & Lorentzen, J., 15 Jun 2017, In : *B M C Neurology*. 17, 20 p., 112.

A critical period of corticomuscular and EMG-EMG coherence detection in healthy infants aged 9-25weeks

Ritterband-Rosenbaum, A., Herskind, A., Li, X., Willerslev-Olsen, M., Olsen, M. D., Farmer, S. F. & Nielsen, J. B., 15 Apr 2017, In : *The Journal of Physiology*. 595, 8, p. 2699-2713

A randomized clinical trial in preterm infants on the effects of a home-based early intervention with the 'CareToy System'

Sgandurra, G., Lorentzen, J., Inguaggiato, E., Bartalena, L., Beani, E., Cecchi, F., Dario, P., Giampietri, M., Greisen, G., Herskind, A., Nielsen, J. B., Rossi, G. & Cioni, G., 2017, In : *P L o S One*. 12, 3, 13 p., e0173521.

Acute exercise improves motor memory consolidation in preadolescent children

Lundbye-Jensen, J., Skriver, K. C., Nielsen, J. B. & Roig, M., 2017, In : *Frontiers in Human Neuroscience*. 11, 10 p., 182.

Contribution of sensory feedback to plantar flexor muscle activation during push-off in adults with cerebral palsy

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Convergence of ipsi- and contralateral muscle afferents on common interneurons mediating reciprocal inhibition of ankle plantarflexors in humans

Mrachacz-Kersting, N., Geertsen, S. S., Stevenson, A. J. T. & Nielsen, J. B., 2017, In : Experimental Brain Research. 235, 5, p. 1555-1564 10 p.

Development and aging of human spinal cord circuitries

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How plastic are human spinal cord motor circuitries?

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Long-term progressive motor skill training enhances corticospinal excitability for the ipsilateral hemisphere and motor performance of the untrained hand

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Muscle disuse caused by botulinum toxin injection leads to increased central gain of the stretch reflex in the rat

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New perspectives on the development of muscle contractures following central motor lesions

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Non-invasive assessment of changes in corticomotoneuronal transmission in humans

Taube, W., Leukel, C., Nielsen, J. B. & Lundbye-Jensen, J., 2017, In : Journal of Visualized Experiments. 123, 8 p., e52663.

Spatial facilitation of reciprocal inhibition and crossed inhibitory responses to soleus motoneurons during walking

Stevenson, A. J. T., Geertsen, S. S., Nielsen, J. B. & Mrachacz-Kersting, N., 2017, *Converging Clinical and Engineering Research on Neurorehabilitation II: Proceedings of the 3rd International Conference on NeuroRehabilitation (ICNR2016), October 18-21, 2016, Segovia, Spain*. Ibáñez, J., González-Vargas, J., Azorín, J. M., Akay, M. & Pons, J. L. (eds.). Cham, Switzerland: Springer, p. 1031-1036 6 p. (Biosystems and Biorobotics, Vol. 15).

Supplementation of docosahexaenoic acid (DHA), vitamin D₃ and uridine in combination with six weeks of cognitive and motor training in prepubescent children: A pilot study

Hansen, S. L., Ritterband-Rosenbaum, A., Voigt, C. B., Hellgren, L., Sørensen, A-D. M., Jacobsen, C., Greve, L. Z., Jørgensen, K. D., Bilde, P. E., Kiens, B. & Nielsen, J. B., 2017, In : B M C Nutrition. 3, 12 p., 37.

Treadmill training with an incline reduces ankle joint stiffness and improves active range of movement during gait in adults with cerebral palsy

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A pilot study on early home-based intervention through an intelligent baby gym (CareToy) in preterm infants

Sgandurra, G., Bartalena, L., Cecchi, F., Cioni, G., Giampietri, M., Greisen, G., Herskind, A., Inguaggiato, E., Lorentzen, J., Nielsen, J. B., Orlando, M., Dario, P. & CareToy Consortium, 2016, In : Research in Developmental Disabilities. 53-54, p. 32-42 11 p.

Aldring

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Basal neurofysiologi

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Botulinum toxin injection causes hyper-reflexia and increased muscle stiffness of the triceps surae muscle in the rat

Pingel, J., Wienecke, J., Lorentzen, J. & Nielsen, J. B., 2016, In : *Journal of Neurophysiology*. 116, 6, p. 2615-2623 9 p.

Changes in corticospinal drive to spinal motoneurons following tablet-based practice of manual dexterity

Larsen, L. H., Jensen, T., Christensen, M. S., Lundbye-Jensen, J., Langberg, H. & Nielsen, J. B., 2016, In : *Physiological Reports*. 4, 2, 11 p., e12684.

Det autonome nervessystem

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Error signals driving locomotor adaptation: Cutaneous feedback from the foot is used to adapt movement during perturbed walking

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Explosive resistance training increases rate of force development in ankle dorsiflexors and gait function in adults with cerebral palsy

Kirk, H., Geertsen, S. S., Lorentzen, J., Krarup, K. B., Bandholm, T. Q. & Nielsen, J. B., 2016, In : *Journal of Strength and Conditioning Research*. 30, 10, p. 2749-2760 12 p.

Forord

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Fra Tanke til Handling - Bevægelsens Neurobiologi

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Fundamentale kontrolmekanismer

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Kognition, opmærksomhed og følelser i bevægelse

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Muskelfysiologi

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Den gennemskuende hjerne

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Gait training facilitates central drive to ankle dorsiflexors in children with cerebral palsy

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Impaired gait function in adults with cerebral palsy is associated with reduced rapid force generation and increased passive stiffness

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Ageing increases the susceptibility to motor memory interference and reduces off-line gains in motor skill learning

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Body part tracking of infants

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Gait training reduces ankle joint stiffness and facilitates heel strike in children with Cerebral Palsy

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Home-based, early intervention with mechatronic toys for preterm infants at risk of neurodevelopmental disorders (CARETOY): a RCT protocol

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Sense of agency is related to gamma band coupling in an inferior parietal-preSMA circuitry

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