

Curriculum Vitae

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Degrees

M.Sc., *Physics*. Minors: *Math* and *computer science*. University of Copenhagen, 1995.
Ph.D., *Chemistry*. University of Copenhagen, 2000.

Experience

Feb 69	Born in Denmark.
Feb 94 - May 95	Diploma work. <i>Max-Planck-Institut für Quantenoptik</i> , Garching, Germany.
Jul 95	M.Sc. <i>Physics</i> . Minors: <i>Math</i> and <i>computer science</i> .
Oct 95 - Jan 96	Promotion stipend. <i>Max-Planck-Institut für Quantenoptik</i> .
Feb 96 - Aug 96	Introductory stipend, <i>DRCMR</i> , Hvidovre Hospital
Oct 96 - Oct 99	Ph.D. study, <i>University of Copenhagen</i> .
Oct 98 - Apr 99	Visiting Ph.D. student <i>Lucas MR Center</i> , Stanford University, California.
Oct 99 - Oct 00	Post doc, <i>DRCMR</i> , Hvidovre Hospital.
Feb 00	Ph.D. <i>Chemistry</i> , <i>University of Copenhagen</i> .
Oct 00 - Oct 06	Chief physicist. <i>DRCMR</i> , Hvidovre Hospital.
Mar 08 - Mar 13	Board member and secretary for the Danish Society for Magnetic Resonance in Medicine.
Nov 06 - present	Senior Researcher and Group Leader (Acquisition technology). <i>DRCMR</i> , Hvidovre Hospital.
Oct 09 - present	Assoc. Prof. at the Technical University of Denmark.
Aug 14 - Oct 16	Member of the ESMRMB Nomination and Awards Committee.
May 14 - present	Board member of the ISMRM study group on detection and correction of motion. Chairman 2017-18.

International event organization

Workshop on Applications of Human Ultra-High Field MRI (program responsible, Copenhagen/Denmark 2010).
4th International DNP Symposium (organizing committee member, Helsingør/Denmark 2013).
ESMRMB Lectures on Acquisition Strategies for Hyperpolarized Spin Systems (organizing committee member, Lyngby/Denmark 2013).
ESMRMB Lectures on MRI simulation (course organizer, Bonn/Germany 2013 & Lyngby/Denmark 2015).
2nd European Congress of Medical Physics (scientific committee, Copenhagen/Denmark 2018)

Awards

Oct. 2009: The European Society for Magnetic Resonance in Medicine and Biology's Info-RESO Award for software available at <http://www.drcmr.dk/bloch>

Publications**Reports**

- L. G. Hanson**, *Wave packet dynamics in two-electron atoms; Influence of a strongly driven core resonance* (1995), diploma work. Supervisors: N. O. Andersen (*University of Copenhagen*) and P. Lambropoulos (*Max-Planck-Institut für Quantenoptik*).
- L. G. Hanson**, *Fast volumetric magnetic resonance spectroscopic imaging; Methodological developments for echo planar spectroscopy* (2000), thesis. Supervisors: K. Schaumburg and O. B. Paulson (*University of Copenhagen*).

Papers in refereed journals (ISI h-index 14)

- L. G. Hanson**, J. Zhang and P. Lambropoulos, *Theory of core-resonant ionization*, Euro Phys Lett, **30**(2), 81-86 (1995).
- L. G. Hanson** and P. Lambropoulos, *Non-dispersing wave packets in two-electron atoms; atomic mode-locking by loss-modulation*, Phys Rev Lett, **74**, 5009-12 (1995).
- L. G. Hanson**, J. Zhang and P. Lambropoulos, *Manifestations of atomic and core resonances in photoelectron energy spectra*, Phys Rev A, **55**, 2232-44 (1997)
- L. G. Hanson**, K. Schaumburg and O. B. Paulson, *Reconstruction strategy for echo planar spectroscopy and its application to partially undersampled imaging*, Magn Reson Med, **44**, 412-17 (2000). <http://eprints.drcmr.dk/19/>.
- L. G. Hanson**, E. Adalsteinsson, A. Pfefferbaum and D. M. Spielman, *Optimal voxel size for measuring global gray and white matter proton metabolite concentrations using chemical shift imaging*, Magn Reson Med, **44**, 10-18 (2000). <http://eprints.drcmr.dk/20/>.
- T. N. Sager, S. Topp, L. Torup, **L. G. Hanson**, B. Egestad and A. Møller, *Evaluation of CAI damage using single-voxel 1H-MRS and un-biased stereology: Can non-invasive measures of N-acetyl-aspartate following global ischemia be used as a reliable measure of neuronal damage?* Brain Res, **892**, 166-75 (2000).
- I. K. Andersen, A. Szymkowiak, C. E. Rasmussen, **L. G. Hanson**, J. Marstrand and L. K. Hansen, *Perfusion quantification using Gaussian process deconvolution*, Magn Reson Med, **48**, 351-61 (2002).
- A. P. Born, I. Law, T. E. Lund, E. Rostrup, **L. G. Hanson**, G. Wildschjødtz, H. C. Lou and O. B. Paulson, *Cortical deactivation induced by visual stimulation in human slow-wave sleep*, Neuroimage, **17**(3), 1325-35 (2002).
- H. K. Mathiesen, T. Tscherning, P. S. Sørensen, H. B. W. Larsson, E. Rostrup, O. B. Paulson, and **L. G. Hanson**, *Multi-slice echo planar spectroscopic MR imaging provides both global and local metabolite measures in multiple sclerosis*, Magn Reson Med, **53**, 750-59 (2005).
- T. Stavngaard, L. V. Sjøgaard, J. Mortensen, **L. G. Hanson**, J. Schmideskamp, A. K. Berthelsen and A. Dirksen, *Hyperpolarised ³He MRI and ^{81m}Kr SPECT in chronic obstructive pulmonary disease*, Eur J Nucl Med Mol Imaging, **32**, 448-57 (2005).
- H. K. Mathiesen, A. S. Nielsen, K. Nielsen and **L. G. Hanson**, *MR-spektroskopi til vurdering af kognitive forstyrrelser*, Ugeskr Laeger, **168**, 357-59 (2006).
- H. K. Mathiesen, A. Jønsson, T. Tscherning, **L. G. Hanson**, J. Andresen, M. Blinkenberg, O. B. Paulson and P. S. Sørensen, *Correlation of global N-acetyl aspartate with cognitive impairment in multiple sclerosis*, Arch Neurol, **63**, 533-36 (2006).
- P. S. Sørensen, A. Jønsson, H. K. Mathiesen, M. Blinkenberg, J. Andresen, **L. G. Hanson** and M. Ravnborg, *The relationship between MRI and PET changes and cognitive disturbances in MS*, J Neurol Sci, **245**, 99-102 (2006).

- K. Nielsen, E. Rostrup, J. L. Frederiksen, S. Knudsen, H. K. Mathiesen, **L. G. Hanson** and O. B. Paulson, *Magnetic resonance imaging at 3.0 Tesla Detects More Lesions in Acute Optic Neuritis Than at 1.5 Tesla*, *Invest Radiol*, **41**(2), 76-82 (2006).
- L. G. Hanson**, T. E. Lund and C. G. Hanson, *Encoding of electrophysiology and other signals in MR images*, *J Magn Reson Imag*, **25**(5), 1059-66 (2007). <http://eprints.drccmr.dk/18/>.
- L. G. Hanson**, *A graphical simulator for teaching basic and advanced MRI techniques*, *RadioGraphics*, **27**(6):e27 (2007). Software available at <http://www.drccmr.dk/bloch>.
- L. G. Hanson**, *Is Quantum Mechanics necessary for understanding magnetic resonance?* *Concepts in Magn Reson A*, **32A**(5), 329-40 (2008). <http://eprints.drccmr.dk/22/>.
- R. de Nijs, M. J. Miranda, L. K. Hansen and **L. G. Hanson**, *Motion correction of Single Voxel Spectroscopy by Independent Component Analysis applied to spectra from non-anesthetized pediatric subjects*, *Magn Reson Med*, **62**(5), 1147-1154 (2009).
- C. í Dali, **L. G. Hanson**, N. Barton, J. Fogh, N. Nair and A. M. Lund, *Brain N-acetylaspartate levels correlate with motor function in metachromatic leukodystrophy*, *Neurology*, **75**, 1896-903 (2010).
- M. Blinkenberg, H. K. Mathiesen, T. Tscherning, A. Jønsson, C. Svarer, S. Holm, F. Sellebjerg, O. B. Paulson, **L. G. Hanson** and P. S. Sørensen, *Cerebral metabolism, magnetic resonance spectroscopy and cognitive dysfunction in early multiple sclerosis: An exploratory study*, *Neurol Res*, **34**(1), 52-8 (2012).
- M. B. Axelsen, M. Stoltenberg, R. Poggenborg, O. Kubassova, M. Boesen, H. Bliddal, K. Hørslev-Petersen, **L. G. Hanson** and M. Østergaard, *Dynamic gadolinium enhanced magnetic resonance imaging allows accurate assessment of the synovial inflammatory activity in rheumatoid arthritis knee joints - a comparison with synovial histology*, *Scand J Rheumatol*, **41**(2), 89-94 (2012).
- M. B. Axelsen, R. Poggenborg, M. Stoltenberg, O. Kubassova, M. Boesen, K. Hørslev-Petersen, H. Bliddal, **L. G. Hanson** and M. Østergaard, *Reliability and responsiveness of dynamic contrast enhanced magnetic resonance imaging in rheumatoid arthritis*, *Scand J Rheumatol*, **42**(2), 115-22 (2013).
- H. Lund, M. Krakauer, A. Skimminge, F. Sellebjerg, E. Garde, H. R. Siebner, O. B. Paulson, D. Hesse and **L. G. Hanson**, *Blood-brain barrier permeability of normal appearing white matter in relapsing-remitting multiple sclerosis*, *PLoS One*, **8**(2), e56375 (2013)
- X. Wu, **L. G. Hanson**, A. Skimminge, P. S. Sørensen, O. B. Paulson, H. K. Mathiesen and M. Blinkenberg, *Cortical N-acetyl aspartate is a predictor of long-term clinical disability in multiple sclerosis*, *Neurol Res*, **36**(8), 701-8 (2014).
- N. Hastrup, S. Khalilieh, D. C. Dale, **L. G. Hanson**, P. Magnusson, A. Tzontcheva, J. Tseng, S. Huyck, E. Rosenberg, and K. Krogsgaard, *The effects of the CXCR2 antagonist, MK-7123, on bone marrow functions in healthy subjects*, *Cytokine*, **72**(2), 197-203 (2015).
- A. Jorgensen, P. Magnusson, **L. G. Hanson**, T. Kirkegaard, H. Benveniste, H. Lee, C. Svarer, J. D. Mikkelsen, A. Fink-Jensen, G. M. Knudsen, O. B. Paulson, T. Bolwig and M. B. Jorgensen, *Regional brain volumes, diffusivity, and metabolite changes after electroconvulsive therapy for severe depression*, *Acta Psychiatr Scand*, **133**(2), 154-64 (2016).
- A. Herskind, A. Ritterband-Rosenbaum, M. Willerslev-Olsen, J. Lorentzen, **L. G. Hanson**, G. Lichtwark and J. B. Nielsen, *Muscle growth is reduced in 15-month-old children with cerebral palsy*, *Dev Med Child Neurol*, **58**(5), 485-91 (2016).
- M. Andersen, **L. G. Hanson**, K. H. Madsen, J. Wezel, V. Boer, T. van der Velden, M. van Osch, D. Klomp, A. G. Webb, and M. J. Versluis, *Measuring motion-induced B_0 -fluctuations in the brain using field probes*. *Magn Reson Med*, **75**(5), 2020-30 (2016).

- S. Møller-Bisgaard, B. Ejbjerg, I. Eshed, K. Hørslev-Petersen, M. Hetland, A.-G. Jurik, H. Thomsen, T. Torfing, K. Stengaard-Pedersen, P. Junker, N. S. Krogh, T. Lottenburger, T. Ellingsen, L. Andersen, H. Skjødt, A. Svendsen, U. Tarp, I. Hansen, J. Pødenphant, J. Pedersen, H. Lindegaard, **L. G. Hanson**, A. Vestergaard, D. Glinatsi, and M. Østergaard, *Effect of a treat-to-target strategy based on methotrexate and intraarticular betamethasone with or without additional cyclosporine on MRI-assessed synovitis, osteitis, tenosynovitis, bone erosion and joint space narrowing in early rheumatoid arthritis – results from a 2 year randomized double blind placebo controlled trial (CIMESTRA)*, *Scand J Rheumatol*, **46**(5), 335-45 (2017).
- C. Göksu, K. Scheffler, P. Ehses, A. Thielscher, and **L. G. Hanson**, *Sensitivity Analysis of Magnetic Field Measurements for Magnetic Resonance Electrical Impedance Tomography (MREIT)*, shared last authorship, *Magn Reson Med*, **79**(2), 748-60 (2018).
- C. Göksu, **L. G. Hanson**, H. R. Siebner, P. Ehses, K. Scheffler and A. Thielscher, *Human in-vivo brain magnetic resonance current density imaging (MRCDI)*, *NeuroImage*, **171**, 26-39 (2018).
- J. E. Wilhjelm, J. Henriksen and **L. G. Hanson**, *A virtual scanner for teaching fundamental magnetic resonance in biomedical engineering*, *Comput Appl Eng Educ*, in press.
- L. Oltedal, K. L. Narr, C. Abbott, A. Anand, M. Argyelan, H. Bartsch, U. Dannlowski, A. Dols, P. van Eijndhoven, L. Emsell, V. Jane Erchingera, R. Espinoza, T. Hahn, **L. G. Hanson**, G. Hellemann, M. B. Jorgensen, U. Kessler, M. L. Oudega, O. B. Paulson, R. Redlich, P. Sienaert, M. L. Stek, I. Tendolkar, M. Vandenbulcke, K. J. Oedegaard, A. M. Dale, *Volume of the human hippocampus and clinical response following electroconvulsive therapy*, *Biol Psychiatry*, in press.
- A. Eldirdiri, S. Posse, **L. G. Hanson**, R. B. Hansen, P. Holst, C. Schøier, A. T. Kristensen, H. H. Johannesen, A. Kjaer, A. E. Hansen and J. H. Ardenkjær-Larsen, *Development of a Symmetric Echo Planar Spectroscopic Imaging Framework for Hyperpolarized ^{13}C Imaging in a Clinical PET/MR Scanner*, *Tomography*, in press.
- P. Magnusson, V. Boer, A. Marsman, O. B. Paulson, **L. G. Hanson** and E. T. Petersen, *Gamma-aminobutyric acid edited echo-planar spectroscopic imaging (EPSI) with MEGASLASER at 7T*, *Magn Reson Med*, in press.
- J. O. Pedersen, C. G. Hanson, R. Xue and **L. G. Hanson**, *General Purpose Electronics for Real-Time Processing and Encoding of non-MR Data in MR Acquisitions*, *Concepts in Magn Reson B*, in press.

Patent applications

- L. G. Hanson**, T. E. Lund and C. G. Hanson, *Encoding and transmission of signals as RF signals for detection using an MR apparatus*, PCT/DK2005/000343, WO/2005/116676, 2005.

Longer conference papers

- L. G. Hanson** and P. Lambropoulos, *Wave packet dynamics in two-electron atoms; Influence of a strongly driven core resonance*, NATO ASI Series: Proceedings of SILAP IV (1995), Kluwer Academic Publishers, Amsterdam.
- P. Willendrup, C. Svarer, **L. G. Hanson** and O. B. Paulson, *A simple approach to combined inhomogeneity correction and tissue segmentation*, in “Brain imaging using PET”, In: Senda M, Kimura Y, Herscovitch P (eds). *Brain imaging using PET*, Academic Press, 159-62 (2002).

- R. Engholm, A. Dubinskiy, R. Larsen, **L. G. Hanson** and B. Christoffersen, *An Adipose Segmentation and Quantification Scheme for the Abdominal Region in Minipigs*, Proceedings of the SPIE, **6144**, 1228-38 (2006).
- J. E. Wilhjelm, **L. G. Hanson**, K.-Å. Henneberg, J. A. Jensen, R. Larsen, L. Højgaard, *A Spiral And Discipline-Oriented Curriculum In Medical Imaging*, Proceedings of the 7th International CDIO Conference 2011.
- L. G. Hanson**, *An active learning approach to education in MRI technology for the biomedical engineering curriculum*, <http://eprints.drcomr.dk/46/>, 11th Active Learning in Engineering Education Workshop (ALE), 2012.
- L. G. Hanson**, *MRI safety in practice: The EU directive on work in electromagnetic fields – practical and clinical aspects*, <http://eprints.drcomr.dk/47/>, syllabus contribution, ISMRM Safety workshop, 2012.

Unrefereed publications

- L. G. Hanson**, J. Zhang and P. Lambropoulos, *Comment on “Observation of Continuum-Continuum Autler-Townes Splitting”*, Phys Rev Lett, **77**(1), 202 (1996).
- L. G. Hanson**, *MR-skanning: Billeder fra den forbudte side af bølgelængdegrænsen*, GAMMA – Tidsskrift for fysik **143**, p. 8-26, 2006. <http://eprints.drcomr.dk/21/>.
- L. G. Hanson**, *Bloch simulator and viewer*, Educational software for illustrating basic phenomena involved in magnetic resonance imaging. <http://www.drcomr.dk/bloch>, 2007
- L. G. Hanson**, *Introduktion til teknikken bag MR-skanning*, Introduction to MRI in Danish, <http://www.drcomr.dk/Intro.pdf>, 44 pages, revised 2009.
- L. G. Hanson**, *Introduction to Magnetic Resonance Imaging Techniques*, Educational material for technical and non-technical students, <http://eprints.drcomr.dk/37/>, translation by Theis Groth, 48 pages, 2009.
- J. E. Wilhjelm, J. Henriksen and **L. G. Hanson**, *En MR-skanner man kan lege med*, MTI - Medicinsk Teknologi og Informatik, **6**(6), p. 10-12, 2009.
- L. G. Hanson**, *MR-skanning ved 7 tesla feltstyrke etableres i Danmark*, MTI – Medicinsk Teknologi&Informatik, **7**(4), p. 20-22, 2010.
- L. G. Hanson**, *Tools and methods for teaching magnetic resonance concepts and techniques*, European Medical Physics News, Summer 2012, p. 17-19, 2012.
- L. G. Hanson**, *The ups and downs of NMR described by classical and quantum mechanics*, book chapter in “Anthropic Awareness - The Human Aspects of Scientific Thinking in NMR Spectroscopy and Mass Spectrometry” edited by C. Szantay, Jr, Elsevier, ISBN: 978-0-12-419963-7, p. 141-171, 2015.