

## CURRICULUM VITAE

Istvan Nagy, MD, PhD, Doctor Medicinae Habilitatus in Theoretical Medicine, Honorary Professor in Theoretical Medicine (University of Szeged, Hungary)

### **Date and Place of Birth:**

18. 05. 1958, Debrecen, Hungary

### **Citizenship:**

Hungarian, British

### **Languages:**

Hungarian, English, Russian

### **Education:**

1976-1982; University of Debrecen (previously University Medical School), Debrecen, Hungary

### **Graduation:**

MD, University of Debrecen (previously University Medical School), Debrecen, Hungary, 1982

### **Postgraduate Degrees:**

CSc ("Candidate of Sciences") in Medical Sciences (PhD equivalent), Hungarian Academy of Sciences, Budapest, Hungary; Title of the thesis: *Morphological, physiological and pharmacological properties of dorsal root ganglion and spinal cord neurons involved in spinal processing of noxious stimuli* (in Hungarian), 1996.

Doctor Medicinae Habilitatus in Theoretical Medicine, University of Szeged, Szeged, Hungary. Title of the thesis: *Characteristics of the transient receptor potential vanilloid type 1 ion channel in health and disease* (in Hungarian), 2013.

### **Honours and Awards:**

1st Prize of the Scientific Association of Medical Students, Debrecen, Hungary, 1980.

MD, University Medical School, Debrecen, Hungary, 1982.

CSc (PhD equivalent) in Medical Sciences, Hungarian National Academy of Sciences, Budapest, Hungary, 1996.

Doctor Medicinae Habilitatus in Theoretical Sciences, University of Szeged, Szeged, Hungary, 2013.

Honorary Professorship in Theoretical Medicine University of Szeged, 2015

### **Professional Affiliations:**

International Association for Studying Pain

European Neuropeptide Club

Society for Neuroscience (USA)

The Physiological Society (UK)

The Pharmacological Society (UK)

## TEACHING

### *Undergraduate:*

1978-1996: Department of Anatomy, Histology and Embryology, University Medical School, Debrecen, Hungary.

1991-1993: Department of Anatomy and Developmental Biology, University College London, United Kingdom.

2001-: Imperial College London, London, United Kingdom.

### *Postgraduate:*

1994-2012: University Medical School, Debrecen, Hungary.

1999-: Imperial College London, London, United Kingdom.

2003-: Various universities as lecturer and examiner

## RESEARCH

### **Research Activities:**

- Studies on the morphological and neurochemical properties and synaptic connections of spinal dorsal horn neurons using light- and electron microscopic techniques and computer-assisted three dimensional reconstruction from electron microscopic serial sections.
- Combined electrophysiological and morphological studies on dorsal root ganglion and spinal cord neurons using intracellular recording and labelling *in vivo* and *in vitro*.
- Neuropharmacological studies on the synaptic transmission between primary afferent fibres and spinal cord neurons using *in vitro* spinal cord-dorsal root ganglion preparations.
- Studies on plastic changes in the neurochemical properties of dorsal root ganglion and spinal cord neurons in painful pathological conditions.
- Studying noxious thermal and mechanical sensitivity in nociceptive dorsal root ganglion neurons.
- Studying the involvement of TRPV1 in the development and maintenance of various pathological conditions including pathological pain, bladder hyperreflexia and type 2 diabetes.
- Studying the role of the endocannabinoid system in nociceptive processing in dorsal root ganglion neurons and spinal cord neurons and in the development of various pathological conditions, including pathological pain and bladder hyperreflexia.
- Studying pathomechanisms involved in the development of migraine.
- Studying signalling mechanisms between injured tissues and primary sensory neurons and plasticity in spinal nociceptive processing following tissue injury.
- Studying epigenetic changes in primary sensory and spinal cord neurons during the development of persistent pain conditions.

**Grants Awarded:**

1986-1990: OTKA 110 (Hungarian); *Correlative morphological and physiological studies on structures of the spinal cord and brain stem*. Dept. Anat. Histol. Embriol., Univ. Med. School, Debrecen, Principal investigator: Gyorgy Szekely.

1986-1990: ETT 032 (Hungarian); *Morphological and physiological studies on the sensory and motor functions of the spinal cord and brain stem*. Dept. Anat. Histol. Embriol., Univ. Med. School, Debrecen, Principal investigator: Gyorgy Szekely.

1986-1990: OKKFT (Hungarian); *Studies on the morphological and neurochemical aspects of impulse transmission*. Dept. Anat. Histol. Embriol., Univ. Med. School, Debrecen, Principal investigator: Gyorgy Szekely.

1991-1993: ETT 04-478 (Hungarian); *Structure and function of neurons*. Dept. Anat. Histol. Embriol., Univ. Med. School, Debrecen, Principal investigator: Gyorgy Szekely.

1991-1994: OTKA 1449 (Hungarian); *Morphological, neurochemical and physiological studies on spinal neuronal networks*. Dept. Anat. Histol. Embriol., Univ. Med. School, Debrecen, Principal investigator: Miklos Antal.

1991-1994: OTKA 1450 (Hungarian); *Correlative morphological and physiological studies on spinal and brain stem neurons and neuronal networks*. Dept. Anat. Histol. Embriol., Univ. Med. School, Debrecen, Principal investigator: Gyorgy Szekely.

1991-1992: Wellcome Trust, European Travel Fellowship; Department of Anatomy and Developmental Biology, University Collage London, UK. Value: £24,000. Principal investigator: Clifford Wolff.

1992:-1993: Wellcome Trust, European Travel Fellowship; Department of Anatomy and Developmental Biology, University Collage London, UK. Value: £12,000. Principal investigator: Clifford Wolff.

1999-2002: Medical Research Council-Novartis Collaborative PhD studentship (G216/4178), *Modulation of neuroactivity in dorsal root ganglion cells in control and pathological conditions*. Department of Anaesthetics, Pain Medicine and Intensive Care, Imperial College London, Faculty of Medicine, London, United Kingdom. Value: £43,000. 16<sup>th</sup> October 1999-15<sup>th</sup> October 2002. Principal investigator: Istvan Nagy

2000-2001: The Royal Society, Equipment Grant (574006.G503/21472/SM), *Modulation of VR1-mediated currents*. Department of Anaesthetics, Pain Medicine and Intensive Care, Imperial College London, Faculty of Medicine, London, United Kingdom. Value: £10,000. 1<sup>st</sup> May 2000-30<sup>th</sup> April 2001. Principal investigator: Istvan Nagy

2004-2006: European Commission Marie Curie Intra-European Fellowship (for Dr Peter Santha; MCIEF 500960). *Insulin receptor-mediated modulation of nociceptor function. Characterisation of primary sensory neurons co-expressing VR1 and the insulin receptor*. Department of Anaesthetics, Pain Medicine and Intensive Care, Imperial College London, Faculty of Medicine, London, United Kingdom. Value: £114,000. 1<sup>st</sup> February 2004-31<sup>st</sup> January 2006. Principal investigator: Istvan Nagy.

2004-2007: Biotechnology and Biological Sciences Research Council-GlaxoSmithKline Collaborative PhD studentship (BBS /N /2004 /11514). *Molecular bases underlying the sensitivity of the capsaicin receptor: TRPV1*. Department of Anaesthetics, Pain Medicine and Intensive Care, Imperial College London, Faculty of Medicine, London, United Kingdom. Value: £73,540. 8<sup>th</sup> November 2004-07<sup>th</sup> November 2007. Principal investigator: Istvan Nagy

2005-2008: BOC Medical. BOC inspire award grant. *Nitrous oxide and clonidine synergy*. Department of Anaesthetics, Pain Medicine and Intensive Care, Imperial College London, Faculty of Medicine, London, United Kingdom. Value: £80,000. Principal investigator: Mervyn Maze

2006-2007: Westminster Medical School Research Trust, Small Research Grant. *The role of TRPV1 in burn-injury evoked pain sensation*. Department of Anaesthetics, Pain Medicine and Intensive Care, Imperial College London, Faculty of Medicine, London, United Kingdom. Value: £4,997. 1<sup>st</sup> May 2006-30<sup>th</sup> April 2007. Principal investigator: Istvan Nagy

2007-2008: British Council, Treaty of Windsor Program 2007/08 – U18, Collaborative Travel Grant. *Physiological, pharmacological properties and inflammation-evoked changes in the expression and responsiveness of the vanilloid type 1 transient receptor potential receptor (TRPV1) in human urothelium*. Department of Anaesthetics, Pain Medicine and Intensive Care, Imperial College London, Faculty of Medicine, London, United Kingdom. Value: £2,000. 1<sup>st</sup> May, 2007-30<sup>th</sup> April, 2008. Principal investigators: Istvan Nagy and Antonio Avelino

2007-2009: Wellcome Trust, Project Grant (061637/Z/06/Z). *Anandamide-synthesizing enzymes in primary sensory neurons*. Department of Anaesthetics, Pain Medicine and Intensive Care, Imperial College London, Faculty of Medicine, London, United Kingdom. Value: £191,823. 1<sup>st</sup> July 2007-31<sup>st</sup> December 2008. Principal investigator: Istvan Nagy

2007-2008: Westminster Medical School Research Trust, Small Research Grant. *The effect of xenon on TRPV1 activity*. Department of Anaesthetics, Pain Medicine and Intensive Care, Imperial College London, Faculty of Medicine, London, United Kingdom. Value: £5,000. 1<sup>st</sup> May 2007-30<sup>th</sup> April 2008. Principal investigator: Istvan Nagy

2009-2010: BJA/RCoA Project Grant. *The role of N-arachidonoyl phosphatidylethanolamine phospholipase D in regulating the activity of*

*primary sensory neurons in naive and inflammatory conditions*. Department of Anaesthetics, Pain Medicine and Intensive Care, Imperial College London, Faculty of Medicine, London, United Kingdom. Value: £49,869. 1<sup>st</sup> February 2009 - 31<sup>st</sup> January 2010. Principal investigator: Istvan Nagy.

2009-2013: Fundacao para a Ciencia e a Tecnologia, PhD studentship: *The role of N-arachidonoyl phosphatidylethanolamine phospholipase D in regulating the activity of primary sensory neurons in naive and inflammatory conditions*. Section of Anaesthetics, Pain Medicine and Intensive Care, Imperial College London, Department of Surgery and Cancer, Faculty of Medicine, London, United Kingdom and Department of Histology and Developmental Biology, University of Porto, Porto, Portugal. Value: 200,000 Euros. 1<sup>st</sup> January, 2009 - 31<sup>st</sup> December 2013. Principal investigators: Istvan Nagy and Antonio Avelino.

2010-2012: European Union Marie Curie Intra-European Fellowship (for Dr Angelika Varga). (254661), *The role of signalling in primary sensory neurons by N-arachidonoyl ethanolamine of primary sensory neuron origin in the development of inflammatory and neuropathic pain*. Section of Anaesthetics, Pain Medicine and Intensive Care, Imperial College London, Department of Surgery and Cancer, Faculty of Medicine, London, United Kingdom. Value: £157,084. 15<sup>th</sup> June 2010-14<sup>th</sup> June 2012. Principal investigator: Istvan Nagy.

2012-2014: BJA/RCoA Project Grant. *Metabonomic Characterisation of Human Models of Inflammatory and Burn Pain*. Section of Anaesthetics, Pain Medicine and Intensive Care, Imperial College London, Department of Surgery and Cancer, Faculty of Medicine, London, United Kingdom. Value: £30,445. 1<sup>st</sup> February 2012-31<sup>st</sup> January 2014. Principal investigator: Carsten Bantel and Istvan Nagy.

2012-2015: NC3Rs PhD studentship. *Improving the principles of the 3Rs through new integrative metabolomic and gene expression resources for signalling studies in burn injuries*. Section of Anaesthetics, Pain Medicine and Intensive Care, Imperial College London, Department of Surgery and Cancer, Faculty of Medicine, London, United Kingdom. Value: £147,572. 6<sup>th</sup> December 2012-5<sup>th</sup> December 2015. Principal investigator: Istvan Nagy.

2012-2013: Astellas Project Grant: *Comparison of capsaicin- and anandamide-evoked desensitization of TRPV1 in cultured primary sensory neurons*. Section of Anaesthetics, Pain Medicine and Intensive Care, Imperial College London, Department of Surgery and Cancer, Faculty of Medicine, London, United Kingdom. Value: £10,000. 1<sup>st</sup> December 2012-30<sup>th</sup> November 2013. Principal investigator: Istvan Nagy

2012-2013: International Association for the Study of Pain: *Hypothalamic modulation of sensory thalamus in migraine*. Section of Anaesthetics, Pain Medicine and Intensive Care, Imperial College London, Department of Surgery and Cancer, Faculty of Medicine, London, United Kingdom. Value: 12,316. 1<sup>st</sup> April 2012-31 March 2014. Principal investigators: Anna Andreou and Istvan Nagy

2012-2017: Migraine Trust: *Investigation of hypothalamic-thalamic interactions in migraine pathophysiology*. Section of Anaesthetics, Pain Medicine and Intensive Care, Imperial College London, Department of Surgery and Cancer, Faculty of Medicine, London, United Kingdom. Value: £415,000. 1<sup>st</sup> December 2012-30<sup>th</sup> November 2017. Principal investigators: Anna Andreou and Istvan Nagy

2013-2016: Chelsea and Westminster Health Charity: *Capacity Building Project in Burns Research at Chelsea & Westminster*. Section of Anaesthetics, Pain Medicine and Intensive Care, Imperial College London, Department of Surgery and Cancer, Faculty of Medicine, London, United Kingdom. Value: £116,688. 8<sup>th</sup> January 2013-7<sup>th</sup> January 2016. Principal investigators: Istvan Nagy and Carsten Bantel.

2013-2017: Wellcome Trust-Imperial College London Clinical PhD Program: *Inflammatory mechanisms of burn injury-associated pain*. Section of Anaesthetics, Pain Medicine and Intensive Care, Imperial College London, Department of Surgery and Cancer, Faculty of Medicine, London, United Kingdom. Value: £247,992. 7<sup>th</sup> August 2013-6<sup>th</sup> February 2017. Principal investigator: Istvan Nagy

2013-2014: Pain Relief Foundation: *Investigating the role of the mechanotransducer channel Piezo2 in headaches pathophysiology*. Section of Anaesthetics, Pain Medicine and Intensive Care, Imperial College London, Department of Surgery and Cancer, Faculty of Medicine, London, United Kingdom. Value: £29,145. 1<sup>st</sup> September 2013-31<sup>st</sup> August 2014. Principal investigators: Istvan Nagy and Anna Andreou.

**Meeting, Session, Workshop Organizer:**

1999: European Winter Conference on Brain Research, La Plagne, France.

2001: European Winter Conference on Brain Research, Arc 1800, France.

2002: European Winter Conference on Brain Research, Arc 1800, France.

2004: European Winter Conference on Brain Research, Arc 1800, France.

2005: 12<sup>th</sup> World Congress on Pain, Sydney, Australia.

2006: European Winter Conference on Brain Research, Villards-sur Ollon, Switzerland.

2007: World Institute of Pain, Budapest, Hungary

2007: European Neuropeptide Meeting, Santorini, Greece.

2008: European Winter Conference on Brain Research, Arc 2000, France

2008: Euroanaesthesia, Copenhagen, Denmark

2009: European Winter Conference on Brain Research, Les Menuires, France

2010: European Neuropeptide Club, Pecs, Hungary

2010: 13<sup>th</sup> World Congress of Pain, Montreal, Canada

2011: European Winter Conference on Brain Research, Les Deux Alps, France

2012: European Winter Conference on Brain Research, Villards-sur Ollon, Switzerland.

2012: 14<sup>th</sup> World Congress of Pain, Milan, Italy  
2013: Neuroinflammation, Prague, The Czech Republic  
2016: 16<sup>th</sup> World Congress of Pain, Yokohama, Japan  
2017: Drug Discovery and Therapy World Congress, Boston, USA

**Consultancies:**

2009: TÁMOP-4.2.2. Supporting innovative researcher teams' projects from basic to applied research. Investigation of the pathomechanisms and therapeutic possibilities of neurodegenerative diseases, anxiety and depression. Hungarian National Development Agency Neurobiological Knowledge Center, University of Szeged, Hungary, and Biological Research Center of the Hungarian Academy of Sciences, Szeged, Hungary.

2013: TAMOP 4.2.2/A Supporting innovative researcher teams' projects from basic to applied research. Dementias, neurodegenerations, and major depression: diagnosis, pathomechanisms and treatment possibilities. Hungarian National Development Agency Neurobiological Knowledge Center, University of Szeged, Hungary, and Biological Research Center of the Hungarian Academy of Sciences, Szeged, Hungary.