

1st European Meeting on

# Brainstem Reflexes and Functions

Organized by *Club Español  
de Electromiografía*

Copyright © 1998  
Josep Valls-Solé  
Eduardo Tolosa

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The brainstem might be only a small part of the brain, but its significance is much more than its size. It serves as a central station between the cerebral hemispheres, the cerebellum and the spinal cord routing signals in the right direction. It contains important regions that regulate the autonomic nervous system, respiration, state of alertness, and consciousness. It houses the cranial nerve nuclei and local interneurons that influence them. The anatomy of the brainstem is intricate and includes the reticular formation, a complex network of cells and processes that almost defies description.

The brainstem certainly does not get the attention it deserves from neurologists, clinical neurophysiologists, physiologists or anatomists.

This new book on Brainstem Reflexes and Functions is a valuable compendium of up-to-date material on anatomy, physiology and clinical aspects. The chapters reflect lectures at the 1st European Meeting on Brainstem Reflexes and Function held in Barcelona in March 1998. The authors are authorities on their selected topics, and there is much to learn.

Much of the book is organized around different brainstem reflexes. Reflexes are an excellent physiological tool for the brainstem and can assess afferents, efferents and internal networks and nuclei. This can be illustrated by the reflex that receives most attention, the blink reflex.

By the way that the reflex is typically studied in the clinical neurophysiology laboratory, as reviewed by Ongerboer de Visser, the afferents are conveyed by the fifth cranial nerve and the efferents by the seventh cranial nerve. There are two responses, an early R1 and a later R2. R1 is ipsilateral only and mediated by an oligosynaptic pathway in the pons. R2 is bilateral and mediated by a polysynaptic pathway that runs along the lateral tegmental field and descends into the medulla. The reflex can be influenced by somatosensory and auditory stimuli, as discussed by Rossi, Mazzocchio and Valls-Solé. Blinking is also part of the startle reflex as noted by Brown. Berardelli, Currá, Montero, Tolosa, and Valls-Solé show how the reflex is altered by disease. DeLaat and colleagues demonstrate how the blink reflex could be used as a tool in human pain research. Topka and colleagues show how the blink reflex is subject to classical conditioning. All these demonstrate how the blink reflex can be a window on brain functioning.

Congratulations are due to Josep Valls-Solé and Eduardo Tolosa for organizing the meeting and this resulting book that will serve as a useful reference for anyone seeking information about how the brainstem works.

Mark Hallett  
Clinical Director  
National Institute of Neurological Disorders and Stroke  
National Institutes of Health, Bethesda, MD 28092, USA



Sponsored by the  
Movement Disorders Society  
and the IFCN

## Editorial

# Second European Meeting on Brainstem Reflexes, Functions, and Related Movement Disorders

Amsterdam, The Netherlands, April 2001

The symposium was organized under the auspices of the Movement Disorder Society, which was also the main sponsor of the conference. The principal objectives of the meeting were to provide a forum for sharing information on and understanding of brainstem physiology and pathophysiology, which may lead to involuntary movements of muscles innervated by cranial nerves. Research in brainstem reflexes, functional anatomy and pathophysiology of the trigeminal, the oculomotor, and the vestibular system relevant to cranial pain, bruxism, cranial hyper- and hypokinesias, startle syndrome, dysphasia, palatal tremor with their treatment modalities, as well as neurosurgery in Parkinson's disease were covered by experts from Europe and the United States. The meeting was attended by approximately 100 participants from 17 countries and 4 continents.

The brainstem is a crossroad of central nervous system functions and a perfect model for the study of cerebral, cerebellar, and spinal cord routing signals and the control from these structures on the confined brainstem interneuronal networks. The latter in turn controls either motor behavior of cranial nerve nuclei or spinal cord interneurons involved in motor and sensory gating systems. The complexity of these systems necessitates a multidisciplinary approach of scientists from neuroanatomical, neurophysiological, neuropharmacological, neurosurgical, neurological, and other medical fields of interest to gain insights into mechanisms underlying normal and disordered movements in which function of brainstem structures is involved. Participants discussed actively the scientific developments and new strategies for further explorations. Due to this active and lively participation, it was unanimously decided, on the initiative of Dr. Valls-Solé, to found a new society for serving the promotion of international exchanges of progress in brainstem research, the Brain Stem Society (B.S.S.).

The organizers of this conference gratefully appreciate the financial assistance of the Movement Disorder Society, SmithKline Beecham, Eli Lilly Nederland, Medtronic, Ipsen, the 4th May Foundation, and the R.A. Laan Foundation, to help defray the costs for holding the symposium and for publishing this supplement.

We hope these articles will stimulate further research in brainstem functions and in endeavors to eradicate the cause of the disabling movement disorders discussed in this symposium.

## Preface

The brainstem might be only a small part of the brain, but its significance is much more than its size. It serves as a central station between the cerebral hemispheres, the cerebellum, and the spinal cord, routing signals in the right direction. It contains important regions that regulate the autonomic nervous system, respiration, alertness, and consciousness. It houses the cranial nerve nuclei and local interneurons that modulate their excitability. The anatomical organization of the brainstem is most intricate, the physiological processes so complex that they almost defy description. The brainstem certainly does not get the attention it deserves from neurologists and physiologists.

This book on *Brainstem Function and Dysfunction* is a valuable compendium of up-to-date material from the Brain Stem Society. The Brain Stem Society is a club of scientists who find this subject — though so difficult — fascinating. The authors of this book are authorities on their selected topics.

The book is divided in four sections: anatomy and imaging; physiology; pain; and movement disorders.

The first section, on anatomy and imaging, describes the use of neurophysiological, neural network, and neuroimaging techniques to trace the corticobulbar motor system, the eye movement control, the brainstem reflex circuits, and the brainstem nociceptive networks in animals and humans.

The second, physiological section collects basic studies in animals and humans dealing with cranial nerve motoneuron functional properties and the brainstem role in limb movement, the brainstem–spinal connections through the trigeminocervical reflexes, the vestibulospinal system, and the brainstem centers that filter the ascending nociceptive input.

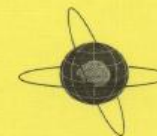
The third and fourth sections are dedicated to the brainstem dysfunctions that generate pain syndromes and movement disorders. The most advanced techniques are used to update pathophysiological and diagnostic information on neuropathic pains, trigeminal neuralgia, Wallenberg syndrome, migraine, startle and reticulospinal dysfunction, progressive supranuclear palsy, cranial and cervical dystonias, facial neuropathy, and hemifacial spasm.

As you may see, the editors have tried to include the most important issues in brainstem physiology and disease. We all hope that these ideas, methods, and findings convince and stimulate others to improve their and our knowledge of the brainstem.

Giorgio Cruccu  
Rome, Italy

Mark Hallett  
Bethesda, MD, USA

# Brainstem Function and Dysfunction



Edited by  
GIORGIO CRUCCU  
AND MARK HALLETT

4<sup>th</sup> International Meeting

# BRAIN STEM SOCIETY



2007

October 12–13,  
Mainz, Germany

**Programme and local organizing committee:**

Marianne Dieterich  
Jürgen Marx  
Frank Thömke

The Brain Stem Society is a young international organisation of researchers focussing on the investigation of all aspects of brainstem function and dysfunction. The first meeting was held in Barcelona in 1998 and further meetings followed in Amsterdam and Rome every third year.

The next meeting of the Brain Stem Society is organised in cooperation with the German Society of Clinical Neurophysiology and Functional Imaging (DGKN) and will be held on October 12–13, 2007 at the Johannes Gutenberg-University in Mainz, Germany. The scientific program will focus on traditional subjects like functional brain stem investigations or the physiology and pathophysiology of pain and movement disorders. Moreover, neuroimaging will play a prominent role. The final session "Meet the Expert" will be devoted to clinical practice with experienced lecturers giving their expert opinion on diagnosis and treatment of brain stem diseases.

We invite you to submit abstracts for oral or poster presentation concerning the main scientific sessions or other topics still related to brain stem function or disease.

Founded 2000 years ago, the city of Mainz owns a unique cultural-historical heritage from Roman antiquity to modern times. Moreover, a golden October will invite you to explore the upper middle Rhine valley, a UNESCO World Heritage.

We hope that you will find the time to join us and to contribute to our efforts in brain stem science.

Prof. Marianne Dieterich

Main Convener  
Vicepresident DGKN  
Mainz, Germany

Prof. Giorgio Cruccu

BSS President  
Rome, Italy

2010



5th International Meeting

# BRAINSTEM SOCIETY

December 9-10, London

Location:

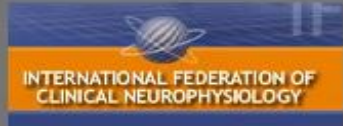
9th December, Basement lecture theatre,  
33 Queen Square

10th December, Wolfson lecture theatre,  
National Hospital for Neurology and  
Neurosurgery

Sponsorship by:



*The Movement Disorder Society*



Clinical Neurophysiology 123 (2012) 2-3

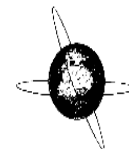


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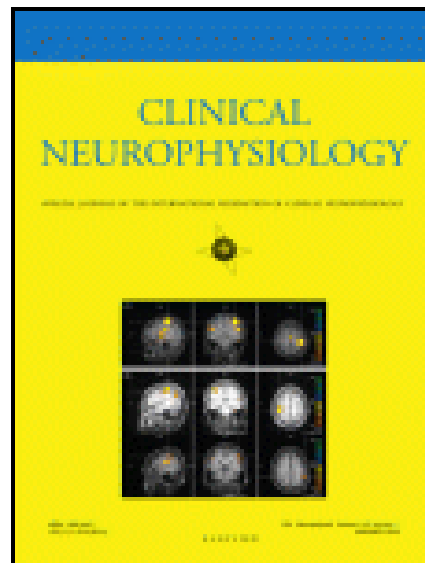
## Clinical Neurophysiology

journal homepage: [www.elsevier.com/locate/clinph](http://www.elsevier.com/locate/clinph)



Editorial

Neurophysiology of the brainstem-structure and function of brainstem circuits





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and the IFCN

## 6<sup>TH</sup> INTERNATIONAL MEETING OF THE BRAINSTEM SOCIETY (BSS)

March 18–19, 2014

**Berlin**



It is our pleasure to welcome you to the 6<sup>th</sup> Congress of the BrainStem Society (BSS). It has been a long journey since the first meeting in 1998, when many of us saw the Society as an opportunity to enrich and further cultivate our knowledge on the complex neurophysiology of the human brainstem. Our Society is small, like the brainstem in comparison to the whole nervous system. However, it gathers devoted members who love the beauty of understanding how the nervous system works. In our meetings, physiology comes typically hand by hand with the study of motor control and of pain disorders and we still have a lot of space to cover if we think that many important functions sit at the brainstem, including autonomic reactions, sleep and others.

We hope that you enjoy the congress as much as we have done in the past, and that the new Executive Board can maintain the old spirits embedded on new ideas and ways.

Josep Valls-Solé, MD PhD

Jens Ellrich, MD PhD