



Academy for  
Multidisciplinary  
Neurotraumatology



FOUNDATION OF THE  
SOCIETY FOR THE STUDY OF  
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# 14<sup>TH</sup> AMN CONGRESS

3 JULY, 2016 | EUROPA HOTEL | EFORIE NORD | ROMANIA



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Volker Hömberg / Germany

Dafin F. Mureșanu / Romania

Gelu Onose / Romania

Ali Otom / Jordan

Hari Shanker Sharma / Sweden

Nicole von Steinbüchel / Germany

Johannes Vester / Germany

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## **GENERAL INFORMATION**

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### **CONGRESS VENUE:**

ANA Hotels – Eforie Nord  
Europa Hotel

Phone: 0040241 / 741.710, fax: 0040241 / 741.720  
Republicii Street no 13, Eforie Nord, Constanta – Romania

### **Registration Desk**

All materials and documentation will be available at the registration desk located at SSNN booth.  
The staff will be pleased to help you with all enquiries regarding registration, materials and program. Please do not hesitate to contact the staff members if there is something they can do to make your stay more enjoyable.

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## ***LANGUAGE***

The official language is English. Simultaneous translation will not be provided.

## ***CHANGES IN PROGRAM***

The organizers cannot assume liability for any changes in the program due to external or unforeseen circumstances.

## ***NAME BADGES***

Participants are kindly requested to wear their name badge at all times. The badge enables admission to the scientific sessions and dinners.

## ***FINAL PROGRAM & ABSTRACT BOOK***

The participants documents include the program and abstract book which will be handed out at the registration counter.

## ***COFFEE BREAKS***

Coffee, tea and water are served during morning coffee breaks and are free of charge to all registered participants.

## ***MOBILE PHONES***

Participants are kindly requested to keep their mobile phones turned off while attending the scientific sessions in the meeting rooms.

## ***CURRENCY***

The official currency in Romania is RON.

## ***ELECTRICITY***

Electrical power is 220 volts, 50 Hz. Two-prong plugs are standard.

## ***TIME***

The time in Romania is Eastern European Time (GMT+2).

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***SCIENTIFIC PROGRAM***

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# 14<sup>TH</sup> AMN CONGRESS

3 JULY, 2016 | EUROPA HOTEL | EFORIE NORD | ROMANIA

*SUNDAY, JULY 3<sup>RD</sup>, 2016*

08:50 – 09:00

*WELCOME ADDRESS:*

Dafin F. Muresanu (Romania), Volker Hömberg (Germany),  
A. V. Ciurea (Romania)

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*SESSION 1, CHAIRPERSONS:* Volker Hömberg (Germany),  
Nicole von Steinbüchel (Germany)

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09:00 – 09:30

Dafin F. Muresanu (Romania)

Pharmacological support with multimodal drugs in TBI  
treatment. Results from a large retrospective cohort trial

09:30 – 10:00

Volker Hömberg (Germany)

Experimental intervention in acute TBI - state of the art

10:00 – 10:30

Nicole von Steinbüchel (Germany)

Differences between disease-specific and generic health  
related quality of life in patients after traumatic brain  
injury

10:30 – 11:00

Kevin Wang (USA)

Blood-Based TBI biomarkers as therapeutic development  
tools in preclinical and clinical studies

11:00 – 11:15

*COFFEE BREAK*

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**SESSION 2, CHAIRPERSONS:** Hari Shanker Sharma (Sweden),  
Anton Alvarez (Spain)

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- 11:15 – 11:45      Hari Shanker Sharma (Sweden)  
Nanowired delivery of Cerebrolysin and mesenchymal stem cells potentiate neuroprotection following concussive head injury
- 11:45 – 12:15      Anton Alvarez (Spain)  
Treatment of neurocognitive deficits and prevention of dementia after traumatic brain injury
- 12:15 – 12:45      Dana Boering (Germany)  
Assessments and stimulation methods in diminished states of consciousness- an update
- 12:45 – 14:00      **LUNCH**

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**SESSION 3, CHAIRPERSONS:** Ali Otom (Jordan), Gelu Onose (Romania)

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- 14:00 – 14:30      Ali Otom (Jordan)  
Current trends in neuropathic pain with special reference to spinal cord injury
- 14:30 – 15:00      Gelu Onose (Romania)  
Our experience on intermittent catheterisation (IC) in post spinal cord injury (SCI) patients with neurogenic bladder (NB), using hydrophylic related devices, with lubrication in close circuit – new data
- 15:00 – 15:30      Cristina Daia (Romania)  
Our experience in post spinal cord injury neurogenic bladder rehabilitation using noninvasive interferential medium frequency currents

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***SESSION 4, CHAIRPERSONS:*** Heinrich Binder (Austria), Kevin Wang (USA)

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- 15:30 – 16:00            A.V. Ciurea (Romania)  
Traumatic chronic subdural hematomas (CSDH) in  
elders (over 70 years old) - Clinical features,  
neuroimaging findings, differential diagnostics,  
neurosurgical approaches, neuroprotection therapy,  
quality of life and global outcome
- 16:00 - 16:30            Heinrich Binder (Austria)  
Posttraumatic Encephalopathy:  
How did that come about?
- 16:30 – 17:00            Johannes Vester (Germany)  
Strategies to Improve TBI Clinical Research  
– Towards a New Gold Standard
- 17:00 – 17:30            ***AMN BOARD MEETING***

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***ABSTRACTS***

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## **TREATMENT OF NEUROCOGNITIVE DEFICITS AND PREVENTION OF DEMENTIA AFTER TRAUMATIC BRAIN INJURY**

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**ANTON ALVAREZ<sup>1,3</sup>**

*JESUS FIGUEROA<sup>1,2</sup>, DAFIN F. MURESANU<sup>3</sup>*

1. Medinova Institute of Neurosciences, Clínica RehaSalud, A Coruña, Spain;
2. Rehabilitation Department, University Hospital, Santiago de Compostela, Spain;
3. Department of Neurosciences, University of Medicine & Pharmacy 'Iuliu Hatieganu', Cluj-Napoca, Romania

Traumatic brain injury (TBI) is a medical condition with an enormous socioeconomic impact because it affects more than ten million people annually worldwide, constitutes the first cause of injury-related death in young adults, and is associated to high rates of lifelong impairments in physical, cognitive and psychosocial functioning.

Neurocognitive deficits are the most common complaints after TBI. Subjects with mild TBI (mTBI) usually experience transient cognitive symptoms, particularly confusion and impairments of verbal and visual memory and attention, and recover cognitive functioning completely within 1-3 months. However, up to 10-15% of the individuals with mTBI show persistent cognitive complaints and difficulties in executive functions such as decreases in cognitive flexibility and in the abilities to maintain attention and to inhibit incorrect responses. Cognitive deficits are also present in almost all patients shortly after moderate and severe TBI (m-sTBI) and include impaired arousal, information processing speed, attention, learning and memory, language, executive functions, and fine motor speed. Cognitive functioning improves during, at least, the first two years after m-sTBI, but more than 50% of these patients endure long-term injury-related disabilities. The investigation of cognitive impairment in TBI patients is a challenging topic because it varies depending on multiple factors such as the severity, type-mechanism and location of the injury, the age of the patient, or the time elapsed since TBI occurred.

In spite of an initial (complete or partial) recovery in most of the cases, some TBI patients show late decline in cognitive functioning, particularly those with advance age and/or with increased levels of depression; and subjects undergoing TBI earlier in life have an increased risk of developing dementia. Several studies showed that a history of m-sTBI anticipates the onset of Alzheimer's disease (AD) at younger ages and that the risk of having AD increases with increasing TBI severity. Similarly, a history of repetitive mTBI was found to be associated with the development of chronic traumatic encephalopathy (CTE), a neurodegenerative condition resembling dementia pugilistica. According to epidemiological studies,

the relative risk of dementia in individuals who had a TBI of sufficient severity as to require hospitalization ranges from 1.5- to 3-fold, and the risk of dementia attributable to TBI is in the range of 5% to 15%.

Treatment of neurocognitive deficits and the prevention of TBI-related dementia were overlooked until very recently, and even nowadays remain priority issues waiting for an effective drug management. Taking into account that the pathogenesis of TBI involves multiple cellular and molecular mechanisms influencing cognitive functioning, recent investigations indicate that multimodal drugs, able to promote brain repair and regeneration by modulating several pathophysiological pathways, constitute the most promising therapeutic option to improve the acute outcome and the long-term recovery of cognitive functions after injury. Several clinical trials demonstrated improvements in cognitive performance after treatment with multimodal peptidergic drugs such as Cerebrolysin in TBI patients. However, large controlled trials and long-term efficacy studies are still needed.

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## ***POSTTRAUMATIC ENCEPHALOPATHY: HOW DID THAT COME ABOUT?***

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***HEINRICH BINDER***

Landsteiner Institute for Neurorehabilitation and Space Medicine Vienna, Austria

It's no wonder that symptoms and signs after traumatic brain injury may continue. For a long time it's known that also minor but repeated head traumas may cause a more or less advancing deterioration of brain functions within the cognitive and/or motor sector. Two clinical pictures catch particular attention: Alzheimer's disease and Parkinson syndrome. Morphological, biochemical and immunological changes during the initial phase of traumatic brain injury are common knowledge. Whereas not much known is about basic pathologic processes in the long run. The enormous growth of technology concerning detection of different biomarkers has led for a better understanding of relationships. From this it follows not only necessary sufficient prevention. Moreover it opens opportunities for prospective therapeutic approaches.



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## ***ASSESSMENTS AND STIMULATION METHODS IN DIMINISHED STATES OF CONSCIOUSNESS- AN UPDATE***

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***DANA BOERING***

Medical Director, Gesundheitszentrum, Bad Wimpfen, Germany

Over the last two decades there was a capacious development of consciousness science, from the implementation and international acceptance of standardized neurobehavioral assessment tools of disorders of consciousness, especially the Coma Recovery Scale Revised, which uncovered a high rate of misdiagnosis, to sophisticated ancillary techniques as brain imaging and electrophysiological examinations. These enhanced our scientific understanding of recovery of consciousness in the human brain following severe brain damage and demonstrated that patients with little or no behavioral evidence of conscious awareness may retain critical cognitive capacities and harbor latent potential for further recovery.

The talk will encompass an overview of actual behavioral and ancillary assessment methods available for scientific use and everyday work in early neurorehabilitation, their respective pros and cons as well as the challenge all of them represent in our effort to deal with DSC patients and enhance their recovery. It will further give an overview on behavioral, pharmacological and noninvasive brain stimulation methods aiming to foster recovery of consciousness, of the growing, yet still incongruent evidence of these methods, of possible ethical implications and still existing caveats.

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## ***TRAUMATIC CHRONIC SUBDURAL HEMATOMAS (CSDH) IN ELDERS (OVER 70 YEARS OLD) CLINICAL FEATURES, NEUROIMAGING FINDINGS, DIFFERENTIAL DIAGNOSTICS, NEUROSURGICAL APPROACHES, NEUROPROTECTION THERAPY, QUALITY OF LIFE AND GLOBAL OUTCOME***

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***ALEXANDRU V. CIUREA<sup>1,3</sup>***

*AUREL MOHAN<sup>4</sup>, LUCA-HUSTI IONUT<sup>3</sup>, GEORGIAN CIOBOTARU<sup>2</sup>, ANDREI ALEXANDRU MARINESCU<sup>1</sup>*

1. Carol Davila" University of Medicine and Pharmacy Bucuresti
2. „Bagdasar Arseni" Emergency Hospital Bucuresti
3. Sanador Clinical Hospital Bucuresti
4. Facultatea de Medicina Oradea, Clinica de Neurochirurgie

### **BACKGROUND**

A subdural hematoma (SDH) is a collection of blood below the inner layer of the dura but external to the brain and arachnoid membrane. Subdural hematoma is

the most common type of traumatic intracranial mass lesion.

Subdural hematomas are usually characterized on the basis of their size and location and the amount of time elapsed since the inciting event age (i.e., whether they are acute, subacute, or chronic). When the inciting event is unknown, the appearance of the hematoma on neuroimaging studies can help determine when the hematoma occurred.

Chronic subdural hematomas (CSDH) are recognized as common in older people (over 70 years). They are produced in minor injuries (falls on the same level). A simple brain CT scan can highlight these hematomas and a neurosurgical intervention will achieve extremely favorable prognosis. There are many pitfalls in the differential diagnosis of CSDH especially with strokes being so common at this age.

#### MATERIALS AND METHODS:

The authors study 22 cases of CSDH, all patients over 70 years old (70-83 years old), all had surgery and follow-up in "Bagdasar-Arseni" Clinical Hospital and Sanador Medical Center (2 cases had bilateral CSDH and 2 cases unilateral CSDH). The study was realized from 01.01.2010 to 01.01.2016. CSDH cases operated by other services were excluded.

All the cases had minor traumatic injuries, usually from falls from the same level and rarely from a different level (stairs, etc. GCS at admission was 15: 0(0%), 14-13: 14(63,63%), 12-9: 6(27,27%), 8-3: 2(9,09%).

All the cases ran sequential CT-scans at admission, immediately postoperative and three months after surgery in order to monitor the patient CSDH and cerebral expansion evolution. Pre and postoperative MRI scans are necessary for intracranial lesions evaluation.

The clinical symptoms that determine the patient for admission are nonspecific and often install in an insidious way, some patients having only minor symptoms. Patients may complain of impaired consciousness with sleepiness, which is associated in varying proportions with headache, walk and balance disorders, cognitive disorders, personality changes, motor deficit or aphasia. Often the onset symptoms are super-imposable on a clinical picture of transient ischemic stroke.

The most common symptoms at admission are headache, confusion syndrome, cognitive & balance disorders, various degrees of neurological motor deficit.

The neurosurgical approach consisted in two burr holes, opening of the membranes and step-by-step evacuation of the subdural hematic collection with insertion of saline solution until observable clear appearance of the liquid. The external non-suctioning drainage tubes were left in the subdural space for 48 to 72 hours until the liquid collection subsides.

After the tubes are removed it is necessary to order a CT-scan for control. All the patients were clinically, generally, neurologically and cardiologically evaluated and received interdisciplinary consultations for the other affections. The patients

stood 72 hours in ICU postoperative, considering the probability of postoperative complications.

All the CSDH were supratentorial. No case was localized in the posterior cranial fossa.

There was no case of spontaneous resolutions of the chronic subdural hematoma in the studied series.

The CT-scan aspect was mainly of bilateral lens hematoma. Accordingly, when the CT imaging reveals iso-dense subdural collection hardly distinguishable from the brain parenchyma and it will not cause a significant mass effect, the differential diagnosis of minor neurological disorders and transient becomes difficult.

Within the neurological therapeutics the administration of anticoagulant and anti-platelet medication is very important in the prevention of acute ischemic events. A major disadvantage of taking this type of medication is that it predisposes to bleeding complications if the patients must undergo major surgery. The latter must be timed according to the medication administered, for varying time intervals that can reach up to several days. These delays in adopting surgical treatment solutions may have important consequences for the affected patients.

On the other hand, the administration of anticoagulant and anti-platelet therapy may increase the volume of intracranial hematic collections with the worsening of the accompanying neurological phenomena.

Amongst other surgical approaches, large craniotomy was used in 4 cases of CSDH which presented multicompartiment aspect. In none of the cases was used the 1 burr hole or simple craniotomy approach. The neurorecovery treatment began immediately after surgery. It included all the cases, kinetotherapy and Cerebrolysin I.V. 2 vials, 10ml for 10 days/3 months. The post operative evolution was favorable in all the studied cases.

GOS at 6 months was: G.R: 2(9,09%), M.D: 16(72,72%), S.D: 3 (13,63%), D: 1 (4,54%). The cases were followed-up between 6 months to 5 years. No recurrence phenomenon was detected. The apparition of neurological deficits in 4 of the cases required MRI scans which concluded with the existence of ischemic cerebral lesions. The dementia presented in 3 of the cases disappeared slowly. We succeeded minor recovery in the cases with incipient debut of Parkinson`s Disease.

Amongst the risk factors in the studied cohort we discovered: arterial hypertension, atrial fibrillations, hypercholesterolemia with dyslipidemia, anticoagulation treatment, diabetes, ischemic cerebrovascular attack, hepatic stenosis, renal lithiasis and alcohol abuse.

#### CONCLUSIONS:

CSDH occurs not only in patients with severe head injury but also in patients with less severe head injuries, particularly those who are elderly or who are receiving anticoagulants, or both. Subdural hematoma may also be spontaneous or be caused by a procedure, such as a lumbar puncture.

CSDH can occur in the elders (over 70 years old) after apparently insignificant head trauma. Often, the antecedent event is never recognized. CSDH is a common treatable cause of dementia or Parkinson debut. A minority of chronic subdural hematoma cases derived from acute subdural hematomas that have matured (i.e., liquefied) because of lack of treatment.

CT-scan represents a fast and complete diagnosis mean of investigating these hematic lesions. We consider the two burr hole neurosurgical approach, the lavage and drainage of the collection the most efficient method of CSDH approach.

Neuroprotection & neurorecovery therapy used in all the cases remains elementary in the postoperative and stationary ICU. Anticoagulation therapy must be resumed in these cases with much prudence and total control over the coagulogram by the cardiologist.

Keywords: chronic subdural hematoma, elderly patients (over 70 years old), GCS, CT scan, GOS, neurosurgery, burr holes, MRI, dementia, Alzheimer, Parkinson, ICU, neuroprotection, neurorecovery, quality of life, outcome.

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## ***OUR EXPERIENCE IN POST SPINAL CORD INJURY NEUROGENIC BLADDER REHABILITATION USING NONINVASIVE INTERFERENTIAL MEDIUM FREQUENCY CURRENTS***

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***CRISTINA DAIA<sup>1,2</sup>***

*GELU ONOSE<sup>1,2</sup>, TIBERIU SPIRCU<sup>1</sup>, AURELIAN ANGHELESCU<sup>1,2</sup>, CRISTINA POPESCU<sup>1,2</sup>,  
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2. The Teaching Emergency Hospital "Bagdasar Arseni", Bucharest, Romania

### INTRODUCTION

We made a comparative retrospective study, on 332 patients (over 18 years old), admitted to our unit, between September 2006 and April 2011, diagnosed with Neurogenic Bladder (NB) mainly after traumatic Spinal Cord Injury – T-SCI – only in sub-acute and post-acute states, divided in two groups (study and control), regarding the outcomes on micturition (dis-)control, through a physiotherapy method. The aim was to objectify the results on NB micturition control recovery, using a standardized non-invasive external electro-stimulation method.

**MATERIAL AND METHODS:** We used Interferential Medium Frequency Current (IMFC) Electrical Stimulation (ES) therapy which consists in generating a deep, intra-tissue energy field that acts, using a "spectrum" formula, on the bladder structures, with their various degrees of denervation, as a training intervention,

due to frequency changes and values.

RESULTS: For incomplete post SCI patients, with NB - ASIA Impairment Scale (AIS) B-C (p value < 0.001, T test) - IMFC ES therapy is effective. For complete post SCI patients, with NB - AIS A, C1-C8 and T1-S5 - IMFC ES therapy seems not efficient.

CONCLUSION: This IMFC ES is a non-invasive rehabilitative therapy which can be applied on any type of NB, being effective in incomplete post SCI patients; it is safe, cheap and accessible.

KEYWORDS: neurogenic bladder, spinal cord injury, interferential medium frequency, electrical stimulation therapy

References:

Onose G, Daia C, Spircu T, Onose L. Validation of Customized Assessment Method and Our Outcomes With Interferential Medium Frequency Electrical Stimulation Therapy for Micturition (Dis-) Control in (Mainly) Post Spinal Cord Injury Patients, Am J Phys Med Rehabil., 2014; 6: 156.

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## ***EXPERIMENTAL INTERVENTION IN ACUTE TBI - STATE OF THE ART***

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***VOLKER HÖMBERG***

Heinrich Heine University of Duesseldorf  
SRH Health Center, Bad Wimpfen, Germany

In this lecture the current evidence based acute treatment guidelines for severe traumatic brain injury will be reviewed. Furthermore the state of the art status of a variety of "experimental" treatment options such as hypothermia, progesterone, use of narcotics (artificial coma), use of possible neuroprotective and neuroplasticity enhancing drugs and peripheral, transcranial and deep brain stimulation techniques will be critically reviewed.

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***PHARMACOLOGICAL SUPPORT WITH MULTIMODAL DRUGS IN TBI TREATMENT. RESULTS FROM A LARGE RETROSPECTIVE COHORT TRIAL.***

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***DAFIN F. MURESANU***

Chairman Department of Clinical Neurosciences, University of Medicine and Pharmacy “Iuliu Hațieganu”, Cluj-Napoca, Romania

TBI is a field with many unmet needs in medicine and public health. It is a major cause of death and disability and also leads to huge direct and indirect costs to society. Currently the incidence of TBI is increasing.

TBI populations are heterogeneous in terms of mechanism of disease, baseline prognostic risk factors, clinical severity and evolution. This heterogeneity generates complex challenges.

New pharmacological approach together with more basic and clinical research is needed for better targeting TBI therapy to the individuals.

The frequent progression of contusive brain injury indicates that this may constitute a subpopulation of TBI more likely to benefit from acute neuroprotection (in the classic sense) by limiting processes involved in secondary brain damage.

Other mechanisms, and consequently different approaches may be more relevant in patients with diffuse axonal injury, and neuroprotection in a more broad sense also includes strategies and therapies aimed at promoting regeneration or replacement of lost neuronal and glial cells, neuronal circuits, and stimulation of neuroplasticity (neurorecovery).

The primary goal of pharmacological support in TBI is to reduce secondary damage (neuroprotection) and to enhance repair (neurorecovery).

The current presentation will highlight the limits of monomodal drugs, the advantages of multimodal drugs and the results of a large retrospective cohort trial with Cerebrolysin in traumatic brain injury.

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**OUR EXPERIENCE ON INTERMITTENT CATHETERISATION (IC) IN POST SPINAL CORD INJURY (SCI) PATIENTS WITH NEUROGENIC BLADDER (NB), USING HYDROPHILIC RELATED DEVICES, WITH LUBRICATION IN CLOSE CIRCUIT – NEW DATA**

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**GELU ONOSE<sup>1,2</sup>**

AURA SPÎNU<sup>1</sup>, CRISTINA POPESCU<sup>1</sup>, IOANA ANDONE<sup>1</sup>, CRISTINA DAIA<sup>1,2</sup>,

AURELIAN ANGHELESCU<sup>1,2</sup>

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2. University of Medicine and Pharmacy “Carol Davila” (UMPCD), Bucharest, Romania

BACKGROUND. SCIs, especially if complete (and if so – usually associated with NB), are some of the most disabling conditions within human pathology – for which, unfortunately, there is (yet ?) no cure, IC being, still, the gold standard in the NB assistive approach.

SCOPE. To objectively assess whether there are significant differences regarding some specific bio-/ pathological and psychometric outcome parameters, related to the use of hydrophilic catheters with lubrication in close circuit (HCLCC) vs. non-hydrophilic ones.

MATERIAL and METHODS. We have comparatively evaluated, within a prospective-retrospective study – approved by the Ethics Commission of our hospital – during March-September, 2015, the outcomes of mid-term IC using the afore mentioned different types of catheters, on two lots (totally 117 patients with mainly retention type of NB): 61 post SCI patients using exclusively HCLCC and respectively, 56 same kind of patients (controls) that used exclusively non-hydrophilic catheters.

The assessment methods consisted of primary data acquisition, based on an unitary customized questionnaire and on two standardized ones (elaborated by the International Spinal Cord Society – ISCoS) and respectively, of statistical analysis methods: univariate (Somers' concordance index and Pearson correlation coefficient), multivariate (standardized canonical discriminator function coefficients – SCDFC); we also used T student combined with Levene, tests and respectively, non-parametric ones: the triad chi- square, Fisher and Z of proportions, and the Mann- Whitney test, too.

(main) RESULTS: The patients benefiting, for IC, exclusively HCLCC vs. those who used exclusively non-hydrophilic catheters, presented a significantly lower number of: inflammatory episodes at scrotal level (p-value < 0.0001), post-intra/inter catheterization bleeding episodes (p-value< 0.0001) and UTI activations (p-value <0.0001).

CONCLUSIONS: Using HCLCC resulted in less post IC complications, thus confirming their beneficial – including of secondary prophylactic kind – capabilities, consequent also to reaching a new, superior, level in the IC type of interventions: from “clean” to (quasi)sterile.

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## ***CURRENT TRENDS IN NEUROPATHIC PAIN WITH SPECIAL REFERENCE TO SPINAL CORD INJURY***

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### ***ALI OTOM***

Director at The Royal Jordanian Rehab Center -King Hussein Medical Center, Jordan

Neuropathic pain is a serious consequence of many neurological disorders, such as spinal cord injury, neuropathy, multiple sclerosis and stroke.

It develops as a result of a lesion or disease affecting the somatosensory nervous system.

Chronic neuropathic pain is considered a disease not a symptom.

Clinically it is characterized by spontaneous ongoing or shooting pain and evoked amplified pain response following noxious or non-noxious stimuli.

Pathophysiological mechanisms are complex and remain a challenge for proper management, although recent research identified different pathophysiological pathways which reflected in improvement of new treatment strategies.

A better understanding of neuropathic pain and its underlying mechanisms will lead to more effective and mechanism-based approach.

Treatment goals include reducing baseline pain and pain exacerbations, ensure a balance between efficacy and safety, and follow individual tailored mechanism-based treatment approach including psychosocial intervention and improvement in quality of life.

This talk will discuss the latest update on mechanism and treatment approaches.



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## **NANOWIRED DELIVERY OF CEREBROLYSIN AND MESENCHYMAL STEM CELLS POTENTIATE NEUROPROTECTION FOLLOWING CONCUSSIVE HEAD INJURY**

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**HARI SHANKER SHARMA<sup>1,3,4</sup>**

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ASYA OZIKZILCIK<sup>6</sup>, HERBERT MÖSSLER<sup>7</sup>, ARUNA SHARMA<sup>\*1,3,4</sup>*

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4. University of Basque Country, Dept of Neurosciences, Bilbao, Spain
5. School of Biomedical Engineering, Dept. of Biomaterials, Indian Institute of technology, Banaras Hindu University, Varanasi, India
6. Dept. Chemistry & Biochemistry, University of Arkansas, Fayetteville, AR, USA
7. Ever NeuroPharma, Oberburgau, Austria

Military personnel are highly vulnerable to concussive head injury (CHI) during combat operations resulting in long-term disability and rehabilitation. So far no suitable therapeutic strategies are working. Thus, novel therapeutic strategies using combination therapy is needed. Recently, stem cells and/or neurotrophic factors are shown to induce neuroprotection in central nervous system (CSN) injuries. There are new evidences showing that nanodelivery of therapeutic agents have superior effects on neuroprotection in brain injury. In this investigation we used nanowired delivery of mesenchymal stem cells (MSCs) together with a multimodal drug cerebrolysin– a powerful combination of various neurotrophic factors and active peptide fragments in CHI to induce neuroprotection in CHI.

CHI was inflicted in rats using a weight drop of 114.6 g on the right parietal skull bone under Equithesin anesthesia from a 20 cm height using a guide tube. This results in an impact of 0.224 N and mimics the “counter-coup” phenomenon as seen by massive injury and volume swelling of the left hemisphere 48 h after the primary insult. In separate groups, commercially available MSCs (1 million cells) were delivered either alone or in combination with Cerebrolysin (2.5 ml/kg; Ever NeuroPharma, Austria) intravenously 4 and 8 after CHI. In another group of animals TiO<sub>2</sub> nanowired MSCs and Cerebrolysin were delivered under identical conditions in CHI. After 48 h CHI blood-brain barrier (BBB) to Evans blue and radioiodine, brain edema and neuronal injuries were examined using standard protocol.

A focal CHI resulted in massive breakdown of the BBB to Evans blue albumin and [131]-Iodine in various brain areas that was significantly higher in the left

hemisphere as compared to the right injured side. There was a significant increase in volume swellings on the left uninjured side as compared to the right injured hemisphere. Neuronal damages as seen using Nissl or H&E staining was also prominent in the cortex, hippocampus, thalamus and hypothalamus that was most pronounced in the left side. Treatment with MSCs and cerebrolysin resulted in significant reduction in brain pathology that was largely seen in the right side as compared to the left hemisphere. On the other hand, when TiO<sub>2</sub> Nanowired MSCs together with cerebrolysin was delivered the left hemisphere also showed marked reduction in the brain pathology.

These observations are the first to demonstrate that a combination of nanowired Cerebrolysin and MSCs synergistically induced efficient neuroprotection in CHI, not reported earlier. It would be interesting to see whether this combination when administered 8 or 12 h after CHI whether neuroprotective effects are still visible at 48 h, a feature currently being investigated in our laboratory.

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## ***DIFFERENCES BETWEEN DISEASE-SPECIFIC AND GENERIC HEALTH RELATED QUALITY OF LIFE IN PATIENTS AFTER TRAUMATIC BRAIN INJURY***

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***NICOLE VON STEINBUECHEL<sup>1</sup>***

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1. Institute of Medical Psychology and Medical Sociology
2. idv-Datenanalyse und Versuchsplanung, Krailling, Germany
3. Department of Neurosurgery, University Hospital Antwerp
4. Institute for Research in Operative Medicine Faculty of Health- School of Medicine Witten/Herdecke University
5. Käpylä Rehabilitation Centre Helsinki
6. Abteilung Allgemeine Psychologie II, Institut für Psychologie der Rheinischen Friedrich-Wilhelms-Universität Bonn
7. QOLIBRI Group: Lindsay Wilson, Stefan Höfer, Monika Bullinger, Silke Schmidt, Holger Mühlhan, Jane Powell, Klaus von Wild, George Zitnay, Wilbert Bakx, Anne-Lise Christensen, Sanna Koskinen, Jaana Sarajuuri, Rita Formisano, Jean-Luc Truelle

Objectives: Many factors are associated with health related quality of life (HRQOL) in patients with TBI. These include the severity of initial injury, different grades of trauma recovery, socio-demographic and psychological characteristics. The sensitivity of HRQOL instruments to such effects is underexplored. We aimed to compare the capacity of the disease-specific QOLIBRI and generic SF-36 instrument to detect significant differences in HRQOL between patients grouped according to these factors.

Methods: A sample of 795 TBI patients was internationally recruited. Participants completed HRQOL questionnaires and sociodemographic, clinical, psychological and health status information was collected. Descriptive, univariate and multivariate (Wei-Lachin) nonparametric analyses, using (a generalization of) the Wilcoxon-Mann-Whitney procedure, were conducted.

Results: Both HRQOL instruments were sensitive to group differences, but QOLIBRI was able to detect a greater number and stronger differences between specified patients groups. HRQOL was especially negatively influenced by patients' dependence on others, depression, anxiety and recovery status; whilst smaller differences were found for living arrangements and participation in leisure activities. Therefore discrimination between different patient-groups within a TBI population is more refined using QOLIBRI in comparison to SF-36. Conclusions: With the QOLIBRI questionnaire therapy effects and their impact on HRQOL after TBI can be monitored in a personalized fashion.

Keywords: Traumatic Brain Injury, Health-Related Quality Of Life, Sensitivity, generic, disease-specific.

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## ***STRATEGIES TO IMPROVE TBI CLINICAL RESEARCH – TOWARDS A NEW GOLD STANDARD***

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***JOHANNES VESTER***

Member of the International Scientific Committee of the SSNN  
Senior Consultant Biometry and Clinical Research  
idv Data Analysis and Study Planning, Germany

Is TBI clinical research stifled by backward oriented designs? Recent reports from interdisciplinary working groups consisting mostly from neurologists, neurosurgeons, neuropsychologists, and biostatisticians, state that to create improvements in TBI treatment, important methodological lessons from the past must be taken into account in future clinical research. An evaluation of neuroprotection intervention studies conducted in the last 30 years has determined that methodological design flaws are major reasons why pharmacological agents fail to demonstrate efficacy.

Almost all the inconclusive studies used a single outcome measure approach. This classic approach in clinical TBI trials cannot capture all clinically relevant functional information in survivors of any kind of TBI. Even survivors of mild to moderate TBI may experience lifelong disturbances in the physical, behavioral, emotional, cognitive (memory, attention, reasoning, communication and planning), motor, sensory, perception and social domains of life that may affect specific or global functioning.

Leading interdisciplinary research groups recently highlighted the multidimensional nature of TBI, such as, e.g., the International Mission on Prognosis and Clinical Trial Design in TBI (IMPACT), stating that “outcome after TBI is by definition multidimensional” or the US Traumatic Brain Injury Clinical Trials Network Group, pointing out that “multiple measures are necessary to address the breadth of potential deficits and recovery following TBI”.

Multidimensional analysis opens a completely new direction for clinical and statistical thinking and is perhaps much closer to the complicated reality of outcome after traumatic brain injury than the previous “one-criterion paradigm” which ruled clinical research on neuroprotective treatments for the last decades. It is thus fortunate that new data analysis procedures are available that are appropriate for this important new multidimensional approach.

The multidimensional strategy is expected to become a key development in TBI clinical research, opening up new horizons for TBI management. Examples from the literature and current study designs in neurosciences are discussed and their implications related to future developments.

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## ***BLOOD-BASED TBI BIOMARKERS AS THERAPEUTIC DEVELOPMENT TOOLS IN PRECLINICAL AND CLINICAL STUDIES***

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***KEVIN WANG***

1. Program for Neurotrauma, Neuroproteomics & Biomarkers Research,  
Department of Psychiatry, Neuroscience and Physiological Sciences, McKnight Brain  
Institute, University of Florida, Gainesville, USA

**BACKGROUND:** In the United States, more than 320,000 US service members sustained TBI between 2000 and 2015. The direct medical costs for treatment of TBI in the U.S. have been estimated to be \$4 billion annually. Types of TBI include penetrating, blast-induced, single and repetitive brain injury. While to date there are still no FDA-approved therapies to treat any forms of TBI, there continues to be strong interests in new therapeutic development towards treating TBI. In parallel, an emerging body of data show that biofluid-based TBI biomarker tests can (i) diagnose the presence of TBI of different severities including even concussion, (ii)

be correlated to injury severity and CT pathology, and (iii) predict outcome. Thus, we propose that the TBI field can benefit from regulatory endorsed tools in assisting in therapeutic or medical product development.

**METHODS:** We systemically data-mined and analyzed a large number of animal and clinical observational and intervention studies. We identified that a number of TBI biofluid biomarker candidates (e.g. GFAP, UCH-L1, S100b and Tau) not only have potentials as in vitro diagnostic tests, but also as “theranostic” tools in facilitating new TBI therapy development and clinical trials. The Food and Drug Administration (FDA) in fact has a regulatory path called “Biomarker Qualification Program (BQP)” that serves to facilitate and ultimately endorse the use of such biomarkers in clinical studies for new TBI therapies if sufficient supportive evidence can be provided.

**RESULTS:** Among the several FDA “Context of Use” biomarkers categories, we identified that the current data point towards a blood-based TBI protein (such as GFAP) that can be used as (i) “Diagnostic Biomarker” in identifying & selecting TBI patients with a biomarker elevation above a predefined cutpoint that is diagnostic of having cranial pathoanatomic lesions and (ii) Prognostic Biomarker in identifying & selecting patients with biomarker elevation above a predefined cutpoint that is prognostic of being more likely to progress to TBI-induced disability or to experience prolonged post-concussive symptoms. Thus, the intended use of such biomarker test(s) will be patient inclusion/enrichment to enable therapy trials more time- and cost-efficiency and to enhance likelihood of achieving quantifiable therapeutic efficacy.

Secondly, based on a matrix of biomarker attributes, analytic performance parameters, and preclinical and clinical validation data points, we identified GFAP as for the first blood based biomarker candidate for the BQP.

Lastly, we also identified a number of current knowledge and technical gaps including the lack of a quantification standard that can be used across various GFAP assay platforms, and additional evidence confirming the diagnostic and prognostic unities of GFAP biomarkers in larger cohorts.

**CONCLUSION:** Thus, by interfacing with FDA, the TBI Endpoint Development Team (TED) is now working towards a pathway that (i) facilitates the identification of the most promising biomarkers in alignment with future TBI drug development, and (ii) focuses on collecting the analytic performance data and clinical evidence that support the use of such biomarker(s) in future TBI therapeutic trials.

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## *CURRICULUM VITAE*

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***ANTON ALVAREZ***  
***SPAIN***

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Medical Doctor (M.D.), University of Santiago de Compostela (1987)  
Diploma of Specialist in Neuroendocrinology, University of Santiago de Compostela (1988)  
Graduate in Psychology, University of Santiago de Compostela (1988)  
Doctorate in Psychiatry, University of Santiago de Compostela (1988-1990)  
Resident Research Fellow of the Ministry of Education and Science (1988-1992)  
Department of Psychiatry, Santiago University (1988-1991)  
Madrid Complutense University (1992)

Psychiatry Doctor (PhD), Department of Psychiatry, Madrid Complutense University (1997)  
Dr. Àlvarez has 22 years experience in Basic and Clinical Research on Alzheimer's disease. He was involved in more than 150 research projects, including projects funded by Public Institutions, pharmaceutical R&D studies, industrial and R+D+I projects, epidemiological studies and two projects funded by the European Comunity: (1) MimoVax: Alzheimer's disease treatment targeting truncated AB40/42 by active immunisation (an STREP -Specific Targeted Research Projects- Project approved through the Six Framework Programme of the European Community to develop and test a vaccine for Alzheimer's disease). Period: 2006-2010. (2) BIOMED-PL-950523-European Concerted Action on Pick's Disease. Period: 1995-1998.

As a result of the research activity developed during this period, Dr. Àlvarez published more than 120 scientific articles in national and international journals and books. In addition, Dr. Àlvarez is actively involved in several scientific forums of his specialty (Congresses, Research Groups, Scientific Journals and Associations).



***HEINRICH BINDER***  
***AUSTRIA***

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EDUCATION:

- |             |  |
|-------------|--|
| 1965 - 1972 | Faculty of Medicine at the University Vienna<br>MD since (promotion on) 1972, June 6th   |
| 1972 - 1978 | University Hospital for Neurology,<br>graduated in Medical Specialist for Neurology and Psychiatry   |
| 9/1982      | Docent for neurology, a title corresponding to PhD   |
| since 1988  | Professor for Neurology, University Vienna<br>founding member of the Austrian Society for<br>Neurorehabilitation   |
| 5/1989      | Head of the Neurological Hospital<br>"Maria Theresien-Schlüssel"   |
| 1994-2007   | Head of Ludwig Boltzmann Institute for Restorative<br>Neurology and Neuromodulation  |
| Since 2008  | Deputy Head of Landsteiner Institute for<br>Neurorehabilitation and Space Medicine   |
| since 2002  | Head of the Neurological Center, Otto Wagner Hospital,<br>Vienna.<br>Main focus: Patients with severe neurological/<br>neuropsychological deficits and invasive neurorehabilitation<br>methods |
- currently  
President of
- Austrian Society for Neurorehabilitation (OEGNR)
  - European Federation NeuroRehabilitation Societies (EFNRS)
- Member of
- Management Committee of the World Federation NeuroRehabilitation (WFNR)





***DANA BOERING***  
***GERMANY***

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After graduation in medicine at the University of Cluj Napoca clinical training in internal medicine at the University Hospital Cluj, then, after resettlement in Germany, achievement of clinical training in neurology and neurorehabilitation in Kettwig and of neurophysiology at the Alfried Krupp Hospital Essen.

Between 2002 and 2016 head of the early rehabilitation department at the St Mauritius Therapieklinik Meerbusch with focus on disorders of consciousness in severe brain injured patients.

Since 2016 assistant medical director at the Gesundheitszentrum Bad Wimpfen

1994-2002 Collaboration with the University of Essen in the field of plasticity after stroke, with an emphasis on the role of the cerebellum in motoric learning tasks

Since 2002 Collaboration with the University of Düsseldorf in the field of plasticity after stroke

Since 2009 Collaboration with the Coma Science Group Liege Belgium

Member of the DOC special interest group of the IBIA.



## *ALEXANDRU V. CIUREA*

### *ROMANIA*

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#### PROFESSIONAL EXPERIENCE

- 1997-Prezent      Profesor of Neurosurgery  
University of Medicine and Pharmacy "Carol Davila" Bucuresti  
Doctorate Coordinator (11 finished PhDs and seven ongoing,  
unfinished doctorates)
- 2004-2008      Pro Dean  
University of Medicine and Pharmacy "Carol Davila" Bucuresti,  
Decision 15209/07.07.2004  
Member of the Board of Professors (2000-2004) (2004-2008)  
Member of the University Senate (2004-2008)
- 2009-Prezent      Scientific Researcher First Degree (by national neurosurgical competition)

#### EDUCATION AND TRAINING

- 1974      Doctorate in Medicine – PhD.
- 1979-Prezent      MD Neurosurgeon (National neurosurgical competition)
- 2004-2011      International Who's who of intellectuals (2004) & International Who's who  
of Intellectuals (2011), Romanian Dictionary of Personalities (2014)

#### PUBLICATIONS

#### RESEARCH

- IMPORTANT AWARDS      90 articles published in Pub. Med. & Thomson ISI and 36 books  
published in the country and abroad
- 18 Research projects  
National Presidential Order " Faithful Service "  
with the grade of Commander (2000)

Romanian Academy Award for the monograph  
"Neurosurgical Pediatric Pathology" 1981.

DR. HONORIS CAUSA            Nominated at four universities (Oradea , Galati , Chisinau , Iasi)

VISITING PROFESSOR        11 important activities: INI, Hannover, Germany,2014 &  
Harvard University, Boston, 2005, etc.

EDITORIAL BOARD

MEMBER OF DIFFERENT SCIENTIFIC SOCIETIES

SPECIAL SCIENTIFIC CONTRIBUTIONS

12 important speciality Journals : World Neurosurgery (USA) & Neurosurgery (USA)

18 memberships (WFNS, EANS, ISPN, ESPN, RSN, CNS, ASM, AMN, EMN, SEENS, AMR, AACNS, etc)

Construction of the first tumor tissue banks in Eastern Europe (2003)

Unitube drain – Registered patent at OSIM with no. 00994 / 2005

Coordination of construction of the Center of Excellence in Neurosurgery 2005 (under the Ministry of Health`s patronage)

Author of two Neurosurgical Treatises – Two volumes ( Medical Publishing 2010 si 2011)

Hidden Anatomy of Michelangelo (Certificate of Innovation registered at OSIM , 2012)

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***CRISTINA DALA***  
**ROMANIA**

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University studies

- The University of Medicine and Pharmacy "Carol Davila"– Faculty of General Medicine, 1999
- The University of Medicine and Pharmacy "Carol Davila"– Faculty of Medicine - specialty Physiokinetotherapy, 2003

Post graduate specialization

- Physician of Physical and Rehabilitation Medicine, 2006

PhD degree

- Research regarding significant recovering after rehabilitation modern therapy post

nevraxial lesions, 2013

Position held

- Assistant Professor, The University of Medicine and Pharmacy "Carol Davila"
- Senior Physician of Physical and Rehabilitation Medicine, The Teaching Emergency Hospital "Bagdasar-Arseni"

Scientific and professional societies

- General Secretary and Founding Member of the Romanian Society for Neurorehabilitation (RoSNeRa) - affiliated to the World Federation for Neurorehabilitation (WFNR)
- Founding Member of Romanian Spinal Cord Society (RoSCoS) - affiliated to the International Spinal Cord Society (ISCoS) and to the European Spinal Cord Injury Federation (ESCIF)

Scientific activity

- Scientific articles and studies: 52
- Books and textbooks coauthored: 8
- Invention/ Patents appointed by the State Office for invention and Marks (OSIM): 3
- International prizes: 2



***VOLKER HÖMBERG***  
***GERMANY***

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PERSONAL DATA Born 25 July 1954

MEDICAL CAREER

1973 - 1980	Medical School, Universities of Düsseldorf and Freiburg; Electives in Neurology at Boston City Hospital, Boston, Mass.; National Hospital for Nervous Diseases, London
1975-1980	Junior researcher in the Department of Neuropsychology at the C. & O. Vogt Institute for Brain Research, Düsseldorf and the Department of Neurology, Freiburg (Prof. R. Jung)
1980 - 1981	Research fellow in the Department of Neuropsychology (Prof. G. Grünewald) at the C. & O. Vogt Institute for Brain Research, Düsseldorf
1981-1986	Clinical training in the Department of Neurology (Prof. H.-J. Freund), Heinrich-Heine-University Düsseldorf
since 1985	Senior registrar in the Department of Neurology, Heinrich-Heine-University Düsseldorf
1987-1996	Senior investigator for the German Research Council Special Task Force in Neurology at Heinrich-Heine-University (SFB 200 and SFB 194)

1987-2005	Medical director of the Neurological Therapy Center (NTC), Heinrich-Heine-University Düsseldorf
Since 1988	Board examiner for Neurology at the local examination board (Ärztchamber Nordrhein)
1989-1997	Vice president of the German Society for Neurological Rehabilitation
1993	Habilitation in Neurology, Heinrich-Heine-University Düsseldorf
Since 1995	Board examiner for physical medicine and rehabilitation (Ärztchamber Nordrhein)
1997-2005	Medical director of the Neurological Therapy Center, Cologne
1998-2004	President of the German Society for Neurological Rehabilitation
2000 to 2010	Medical director and head of Neurology, St. Mauritius Therapy Hospital, Meerbusch
Since 10/2011	Head of Neurology SRH Gesundheitszentrum Bad Wimpfen
10/2004 to 12/2010	Vice president of the German Society for Neurological Rehabilitation
2005 to 2010	Panel-Chairman Neurorehabilitation for European Federation Neurological Societies (EFNS)
Since 12/2010	Member of the board (DGNR)
Since 2003	Secretary General World Federation for NeuroRehabilitation (WFNR)
Since 2011	Secretary General European Federation of Neurorehabilitation Societies (EFNR)
Since 2015	Vice President of EFNR

Areas of scientific interest    Motor control  
   Neuropsychology,  
   Brain plasticity  
   Epistemology of rehabilitation sciences  
   Pharmacology in neurorehabilitation

Publications                            more than 200 original articles in peer reviewed journals



## *DAFIN F. MURESANU*

### *ROMANIA*

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Dafin F. Mureșanu, MD, PhD, MBA, FANA

Professor of Neurology, Senior Neurologist, Chairman of the Neurosciences Department, Faculty of Medicine, University of Medicine and Pharmacy "Iuliu Hatieganu" Cluj-Napoca, President of the Romanian Society of Neurology, President of the Society for the Study of Neuroprotection and Neuroplasticity (SSNN), member of the Academy of Medical Sciences, Romania, secretary of its Cluj Branch. He is also member of 13 scientific international societies (being member of the American Neurological Association (ANA) - Fellow of ANA (FANA) since 2012) and 7 national ones, being part of the executive board of most of these societies. Professor Dafin F. Mureșanu is a specialist in Leadership and Management of Research and Health Care Systems (specialization in Management and Leadership, Arthur Anderson Institute, Illinois, USA, 1998 and several international courses and training stages in Neurology, research, management and leadership). Professor Dafin F. Mureșanu is coordinator in international educational programs of European Master (i.e. European Master in Stroke Medicine, University of Krems), organizer and co-organizer of many educational projects: European and international schools and courses (International School of Neurology, European Stroke Organisation summer School, Danubian Neurological Society Teaching Courses, Seminars - Department of Neurosciences, European Teaching Courses on Neurorehabilitation) and scientific events: congresses, conferences, symposia (International Congresses of the Society for the Study of Neuroprotection and Neuroplasticity (SSNN), International Association of Neurorestoratology (IANR) & Global College for Neuroprotection and Neuroregeneration (GCNN) Conferences, Vascular Dementia Congresses (VaD), World Congresses on Controversies in Neurology (CONy), Danube Society Neurology Congresses, World Academy for Multidisciplinary Neurotraumatology (AMN) Congresses, Congresses of European Society for Clinical Neuropharmacology, European Congresses of Neurorehabilitation). His activity includes involvement in many national and international clinical studies and research projects, over 350 scientific participations as "invited speaker" in national and international scientific events, a significant portfolio of scientific articles (134 papers indexed on Web of Science-ISI, H-index: 15) as well as contributions in monographs and books published by prestigious international publishing houses. Prof. Dr. Dafin F. Mureșanu has been honoured with: the Academy of Romanian Scientists, "Carol Davila Award for Medical Sciences / 2011", for the contribution to the Neurosurgery book "Tratat de Neurochirurgie" (vol.2), Editura Medicala, Bucuresti, 2011; the Faculty of Medicine, University of Medicine and Pharmacy "Iuliu Hatieganu" Cluj-Napoca "Octavian Fodor Award" for the best scientific activity of the year 2010 and the 2009 Romanian Academy "Gheorghe Marinescu Award" for advanced contributions in Neuroprotection and Neuroplasticity.



**GELU ONOSE**  
**ROMANIA**

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Dr. Gelu Onose - 59 years (born: the 20th of December, 1956); graduated, in 1982, from the Faculty of General Medicine, within the Institute of Medicine and Pharmacy, in Bucharest, Romania

- Professor (since 2008) at the (State) University of Medicine and Pharmacy "Carol Davila" (UMPCD), in Bucharest – member of the Academic Council of the Faculty of Medicine of the UMPCD

- Doctoral/ Post-Graduate Tutor (since 2008) - at the UMPCD, in Bucharest

- MD; - PhD; - MSc

- Senior Physician of: - Physical & Rehabilitation Medicine (PRM) – since 1994 – and

- Gerontology & Geriatrics (G-G) – since 2000

Competences in: - General Ultrasonography (since 1996)

- Management of sanitary services (since 2000)

- Chief of the of the UMPCD PRM Discipline and of the P(neural-muscular)RM Clinic Division (since 2005) - the National Reference Center for NeuroRehabilitation - and of its RDI Nucleus, at the Teaching Emergency Hospital "Bagdasar-Arseni" (TEHBA), in Bucharest

- President Co-Founder of the Romanian Society for Neurorehabilitation (RoSNeRa) – affiliated to the World Federation for NeuroRehabilitation (WFNR) - member of the Council - respectively, of the Romanian Society for Spinal Cord Pathology, Therapy and Rehabilitation (RoSCoS) – affiliated to the International Spinal Cord Society (ISCoS) and to European Spinal Cord Injury Federation (ESCIF) – (since 2008/ 2009) and respectively, Honorary Executive President of the Romanian Society of Physical and Rehabilitation Medicine & BalneoClimatology (since 2015)

- A member of the Scientific Committee – proposed Co-ordinator for SCI researches (2014) – afferent to the Prezidium of the world Academy for Multidisciplinary Neurotraumatology (AMN)

- Selected and invited - as among "Highly-specialized scholars" - by Thomson Reuters to participate in the invitation-only "Academic Reputation Survey", within its related partnership with Times Higher Education's influential World University Rankings: 2010, 2011, 2012

- Invited Peer-Reviewer (March 2010) by the "Journal of Molecular Histology" and (March, 2012) by the "Spinal Cord" journal (both ISI Thomson Reuters rated)
- Contributing member/ (2011-2012) to the achievement of the imposing educational project: "E-Learning for Spinal Cord Injury Health Professionals", of the International Spinal Cord society (ISCoS) - including/ specifically, in 4 modules/ submodules of it: (Clinical Assessment of Patients with SCI; Assistive Technology Module and Mobility & seating sub-module; Management of neurogenic bladder; Physiotherapy Module and Physical therapy perspectives on rehabilitation sub-module
- Guest Editor within its Special Issues: Second Edition, Vol. 4, 2011 and Vol. V, Third Edition, 2012
  - Founder Member of the Honorary Editorial Board of the Journal of Neurorestoratology (since 2013)
  - Senior Expert (since 2012) and also Rapporteur (since 2013) on Chronic Conditions Management and respectively, for Healthy and Active Ageing (since 2016) – of the Comité Permanent/ Standing Committee of the European Doctors (CPME)
- Invited lecturer to all – since the first – European Teaching Courses on Neuro-Rehabilitation, with training conference presentations (in 2011, 2013, 2015) and respectively, with contributions to the organization of its edition, in 2012
- Invited Professor to deliver two extended lectures to the Symposium: "BEYOND TBI (Optimizing Management in TBIs)", held in August, 2013, in Mumbai, India, within an International Educational Program of McCann-Erickson Healthcare Complete Medical
- 8 published medical books – one of them : "The Spondyloarthropathies" received, in 2002, the "Iuliu Hatieganu" Award of The Romanian Academy)
- 6 (of which 2 equivalent micro-monographs - in journal, work) chapters within medical books
- Around 250 scientific works, papers – communicated within national and international scientific meetings and/or published in peer-reviewed or non peer-reviewed medical journals – and professional interviews/ articles, in mass-media
- 3 Patents/ Invention Certificates and 2 Utility Models, appointed by the State Office for Inventions and Marks (SOIM/ OSIM)
- Main awards: the "Iuliu Hatieganu" Award of The Romanian Academy (2002); the Award of the (Romanian) National Authority for Scientific Research for the RDI project acronymed "ACTUAT" (2006); the Gold Medal at the International Saloon of Inventions, Geneva/ Switzerland for the RDI project acronymed "MOD" (2008); the "Excellency in the Health



Domain Award " – granted by the Romanian Ministry of Health (2015)

- A member of the Scientific Council/ Editorial Board of medical journals:
  - "Journal of Medicine and Life" (rated in Index Medicus, Medline)
  - "Infomedica"
  - (Romanian) "Rehabilitation, Physical Medicine and Balneology"
  - "Romanian Neurosurgery"
  - "Industria Textila" (ISI Thomson rated journal)
  - Founder Member of the Honorary Editorial Board of the "Journal of Neurorestoratology"
  
- A member of the (scientific societies):
  - Romanian Medical Association (RMA)
  - Romanian Society of Physical and Rehabilitation Medicine (PRM) - including of its Board
  - Romanian Society of Neurosurgery (RSN)
  - Romanian Society of Biomaterials (RSB)
  
  - Balkan Medical Union (BMU),
  - International Society of Hydrothermal Technique (SITH - the National Council of the Romanian Section SITH - RS)
  - British Society of Gerontology (BSG)
  - International Spinal Cord Society (ISCoS)
  - European Spinal Cord Injury Federation (ESCIF)
  - World Academy for Multidisciplinary Neurotraumatology (AMN)
  - World Federation For Neurorehabilitation (WFNR) - a member of the Council/ Management Committee
  - International Society of Physical and Rehabilitation Medicine (ISPRM)



***ALI OTOM***  
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ALI H. OTOM MD. D. Med. Rehab (London), EB PRM, JB  
Senior Consultant in Spinal Injuries & Musculoskeletal Medicine  
Director of the Royal Rehabilitation Center - King Hussein Medical Center  
Head of Spinal Unit  
Vice-President and Chairman Membership Committee IANR  
Fellow of the International Spinal Cord Society (ISCOS)  
Advisory Committee Member of ISCOS  
Founder President of Jordanian Association for Spinal Cord Injury Care (JASCIC)  
Board Member of the Faculty of Rehabilitation Sciences-Jordan University  
President of Jordanian Physicians Osteoporosis Society  
Board Member of PAN Arab Osteoporosis Society  
Chair, PRM Scientific Committee-Jordan Medical Council  
Founder Member of the Honorary Editorial Board of the Journal of Neurorestoratology



***HARI SHANKER SHARMA***  
***SWEDEN***

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Hari Shanker Sharma, Director of Research (International Experimental Central Nervous System Injury & Repair, IECNSIR), University Hospital, Uppsala University is Professor of Neurobiology (MRC), Docent in Neuroanatomy (UU) and is currently affiliated with Department of Surgical Sciences, Division of Anesthesiology and Intensive Care Medicine, Uppsala University, Sweden. Hari Sharma was born on January 15, 1955 in an Industrialist town Dalmianagar (Bihar), India. He did his Bachelor of Science with Honors from the prestigious L. S. College Muzaffarpur in 1973 and secured 1st position in his batch. He obtained his Master Degree from Bihar University with special expertise in Cell Biology in

1976 and awarded Gold Medal of Bihar University for securing 1st position in the 1st Class. Hari Sharma joined the group of Professor Prasanta Kumar Dey, a neurophysiologist by training in the Department of Physiology, Institute of Medical Sciences, Banaras Hindu University, Varanasi in 1977 to obtain Doctor of Philosophy Degree (D.Phil.) in Neurosciences and was awarded Ph.D. in 1982 on "Blood-Brain Barrier in Stress." Hari Sharma after carrying out a series of Government of India funded Research Projects on the BBB and brain dysfunction (1982–1987), joined the lab of Neuropathology at Uppsala University with Professor Yngve Olsson in 1988 to investigate passage of tracer transport across the BBB caused by stress or traumatic insults to the Brain and Spinal cord at light and electron microscopy. Dr. Sharma awarded the prestigious Alexander von Humboldt Foundation Fellowship of German Government (1989–1991) to work on hyperthermia induced BBB dysfunction at the ultrastructural level in the laboratory of Professor Jorge Cervós-Navarro (a living "Legend in Neuropathology in Europe"). Dr. Sharma joined again Uppsala University and established a network of collaboration on "Experimental CNS Injury Research Group" as a lead investigator with eminent collaborators in various parts of Europe, USA, and Australia (1991–). On his work on hyperthermia Dr. Sharma received the prestigious Neuroanatomy award "Rönnows Research prize" of Uppsala University for "best neuroanatomical research of the year 1996" followed by the Award of the Degree of Doctor of Medical Sciences of Uppsala University in Neuroanatomy in 1999 and selected for the Best Thesis Award of the Medical faculty, "The Hwassers Prize" of 1999. On his meticulous works on the Blood Brain barrier and Brain edema (2000–2003) Dr. Sharma earned the prestigious title of "Docent in Neuroanatomy" of Medical Faculty, Uppsala University in April 2004. Currently his main research interest is Neuroprotection and Neuroregeneration, in relation to the Blood-brain barrier in stress, trauma, and drugs of abuse in health and disease.

Dr. Sharma on his research on brain pathology and neuroprotection in different models received the prestigious awards from The Laerdal Foundation of Acute Medicine, Stavanger, Norway, in 2005 followed by Distinguished International Scientists Collaboration Award by National Institute on Drug Abuse (NIDA), Baltimore, MD (2006–2008). His recent work on 5-HT<sub>3</sub> receptor mediated neuroprotection in morphine withdrawal induced neurotoxicity won the coveted prize of Best Investigator Award 2008 and Best Scientific Presentation by European Federation of the International Association for Study of Pain (ISAP), and Awarded during their VI Annual Meeting in Lisbon, September 9–12, 2008. His recent research is aimed to find out the role of nanoparticles in Neurodegeneration and Neuroprotection using various treatment strategies that is supported by European Aerospace Research and Development (EOARD), London, UK and US Air Force Research Laboratory, Wright Patterson Air Force Base, Dayton, Oh, USA. On his works on Blood–brain barrier in hypertension and diabetes together with Romanian colleagues, University of Medicine and Pharmacy "Iuliu Hatieganu," Cluj-Napoca, Romania awarded Dr. Sharma with Honorary Doctorate of Medical Sciences in 2009. Dr. Sharma's work over 30 years on the blood-brain barrier and brain edema won him the US Neurosurgeon Dr. Anthony Marmarou Award (2011) by the International Brain Edema Society at their 15th Congress in Tokyo, Japan, November 20–24, 2011. His works on Nanoneuroscience and development of nanomedicine to treat the CNS injuries has won accolades at various Government and International Scotties or Organization across the World. Accordingly Dr Sharma was decorated with the most prestigious "Hind Rattan Award

2012" (Jewel of India) on the eve of Republic Day of India 25th January 2012 and Mahatma Gandhi Pravasi Gold Medal on October 12, 2012 in House of Lords, London, UK. Based on his outstanding contribution in Nanoneuropharmacology and nanodrug delivery to treat central nervous system (CNS) diseases including Neurodegenerative diseases such as Alzheimer's and Parkinson's Hari Sharma bestowed with Prestigious Gujarat Govt. International Visionary Award 2012 in a glittering function in Ahmedabad, Gujarat on Nov 23, 2012. His further research on co-morbidity factors e.g., hypertension or diabetes may alter pathophysiology of brain injuries and require higher drug dose or nanodrug delivery of neuroprotective agents to minimize brain dysfunction is recognized by Govt. of India by presenting him one of the coveted "Bharat Jyoti Award 2013" (Glory of India) by His Excellency Governor Balmiki Prasad Singh in Hotel Le Meridien, New Delhi on Jan 12, 2013. Dr Sharma also received the highest Award of the Govt. of India "Navrattan Award 2013" (Nine Jewels of India) on the eve of 64th Republic Day of India (25th January 2013) by His Excellency Governor Bishma Narain Singh, in Ashok Hotel, New Delhi. Hari Sharma is Founding President of the Global College of Neuroprotection & Neuroregeneration (2004-); Elected President of International Association of Neurorestoratology (IANR) (2014-); and selected Senior Expert of Asia-Pacific CEO Association, Worldwide (APCEO) (2012-) for his contribution to uplift scientific research in many countries Globally that may have better economic and social benefit for the mankind. Hari Sharma awarded coveted National Award "Sword of Honor" 2015 by Govt. of India on the eve of 66th Republic Day of India 25th January 2015 in New Delhi Eros Hotel International during the 34th Non-resident Indian (NRI) conclave by Speaker of Lok Sabha (Indian Parliament) the Hon'ble Mrs Meira Kumar of Indian national Congress (INC) Party for the continued extraordinary achievement in nanomedicine for public health awareness and possible therapeutic measures.

Based on his expertise in Nanoneuroscience, Hari Sharma was also invited to organize and chair Nanosymposium in Society for Neuroscience meetings in Chicago (2009), San Diego (2010), Washington DC (2011), New Orleans (2012), San Diego (2013) and Washington DC (2014, Nov 15-19, 2014); Chair Neurobiology Symposium 14th Int. Amino Acid & Peptide, Vienna, Austria; Keynote speaker & Chair Nanotechnology-2015, Frankfurt, Germany. Hari Sharma is also the recipient of Prestigious US TechConnect Global Innovation Award 2013 at the National Innovation Summit & Innovation Showcase, Washington DC May 12-16, 2013 on his work on Nanowired cerebrolysin in Neuropathic Pain. Hari Sharma Served as one of the Poster Judges in 2014 180th Annual Meeting of American Association of Advancement of Science (AAAS) Held in Chicago, IL, USA Feb 13-17, 2014 followed by 181st Annual Meeting of American Association of Advancement of Science (AAAS) held in San José, CA, USA Feb 12-16, 2015. Hari Sharma has published over 350 research papers and 85 reviews, 14 monographs, and 80 international book chapters and edited 18 book volumes with Current H-index = 38 (ISI Database) as of today. He served as Guest Editor of *Curr. Pharm. Desig.* (2005, 2007, 2010-); *J Neural. Transmiss.* (2006, 2011-) and is the founding Editor-in-Chief of *Int. J. Neuroprotec. Neuroregen.* (2004-), UK and the European Editor of *Central Nervous system-Neurological Disorders Drug Target* (2013-). Dr. Sharma is on board of various International Journals including *CNS and Neurological Disorders-Drug Targets*, USA (2010), *Journal of Neurodegeneration and Regeneration*, USA (2009-); *Austin Journal of Nanomedicine & Nanotechnology* (2014-); and is associate editor of *Journal*

of Nanoscience and Nanotechnology (Nanoneuroscience 2006–), USA, Review Editor—Frontiers in Neuroengineering (2007–), Frontiers in Neurorestoratology, and Associate Editor of Frontiers in Aging Neuroscience (2008–), Frontiers of Fractal Physiology (2010–), Switzerland, Journal of Neurorestoratology, Dove Medical press, London, UK (2012–), WebMD Central, Neurology Faculty, Advisory Board Member (2010–), World Journal of Pharmacology (2011–), Journal of Physical Medicine and Rehabilitation, USA (2012–). Dr. Sharma served as volume editor of several progress in Brain research series (Volumes 104, 115, 162 and 180), International review of Neurobiology (Volume 82 and 102) and other Springer Volumes on Spinal cord injury (1988) and Handbook of Neurochemistry (2009) apart from stand alone books (Elsevier, Springer and Academic Press since 1994). Dr. Hari Sharma is invited to join several National Academies of repute including New York Academy fo Science, USA (since 1994–); International Academy of Stress, New York (2003–), Swedish Academy of Pharmaceutical Sciences (2010–). Dr. Sharma has served as an expert evaluator and advisor to various Boards, Councils and Institutions for their Research Grants including Wellcome Trust, London, UK (2011–); Catalan Agency for Health Information and Quality, TV3 (2010–), European Commission Projects (2002–), European Nanomed Council (2009–), Ministry of Health Science Foundation; Medical research Council and University Commission of Grants in various countries in Europe, USA, UK, Canada, Hong Kong, Singapore and in Australia. Some of the notable organizations include: Australia and New Zealand Health Council (2000–); University Commission of Grants, Hong Kong (2002–), Singapore Medical Council, Singapore (2003–); UK Charity Organization “Research on Ageing: Help the Aged” (2003–); Euro Nanomed (2010–). Dr. Sharma is designated as ambassador of the City of Uppsala 2007, by Uppsala County administration and Uppsala Tourism for promoting Uppsala, Sweden as International Research Collaboration/Meetings and Conference Destination. Dr. Hari Sharma is married to Aruna Sharma (nee Bajpai) since 23rd April 1979 and has two sons. Dr Sharma is designated as Visiting Professor, University of Basque Country, Bilbao, Spain supported by Basque Govt. Foundation. His political affiliation belongs to Swedish Social Democrat Party (Socialdemokraterna, Sverige) where he is associated with the development of Education and Research matters in Sweden actively.



## *NICOLE VON STEINBUECHEL*

*GERMANY*

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Since 2004/2005	Director of the Department of Medical Psychology and Medical Sociology, University Medical Center, Georg-August-University of Göttingen
2001-2004	Associate Professor (C4) of Gerontopsychology at Geneva University and Head of the Neurogerontopsychology Unit, Department of Psychogeriatrics, Geneva University Hospital
1999-2000	C3-Research Professor of the Dorothea-Erxleben Foundation, Magdeburg University
1993-1997	C3-Professor of Medical Psychology, Institute of Medical Psychology (IMP), Munich University (LMU)
1997	Postdoctoral thesis ("Habilitation") in „Clinical Psychology and Neuropsychology“, Leopold-Franzens University, Innsbruck
1987-1993	Graduation (Dr. rer. biol. hum.) and scientific researcher at the IMP, LMU
1985	Diploma in psychology at the Institute of Psychology, Munich University, studies in philosophy and history of art

### Main areas of work (Selection)

Neuropsychology (aging, dementia, stroke, TBI), cognition, (intercultural) health-related quality of life research, currently outcome work package leader of the CENTER-TBI-Study of 5000 patients after traumatic brain injury (TBI) at four time points in two years.

### Offices (Selection)

1998-2002	Vice-Chair of the German Society of Medical Psychology
2001-2005	Member of the board of the Swiss Society of Psychology
Since 2003	Member of the board, vice-treasurer of the Academia, currently Vice President of the Multidisciplinaria Neurotraumatologica (AMN)
2007-2010	Member of the board of the European Brain and Behaviour Society (Scientific Committee)
2008	Founding member of the International Society for Clinical Neuromusicology
2008-2011	President of the QOLIBRI Society



***JOHANNES VESTER***  
***GERMANY***

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Born, 1952, he specialized in Veterinary Medicine between 1971 and 1974 at the University in Munich, then changed to the University in Cologne in 1974 and specialized in Human Medicine from 1974 to 1980. In 1976 to 1979, he additionally studied biometric methods for pharmacology and clinical research at the Institute for Data Analysis and Study Planning in Munich. While studying human medicine, he completed research work on pattern recognition in the visual brain and developed a pharmacodynamic Neuron Simulation Model at the Institute for Medical Documentation and Statistics of the University at Cologne.

From 1985 to 1995, he was member of the Ultrahigh Dexamethasone Head Injury Study Group and leading biometrician of the German GUDHIS project in Traumatic Brain Injury.

Since 1982 he holds > 100 advanced training courses on biometry for professionals in clinical research as well as teaching courses for university institutions and international societies. Since 1995 he is Senior Consultant for Biometry & Clinical Research. He planned and evaluated about 150 randomized clinical studies worldwide and is member of various international Advisory Boards and Steering Committees including participation as biometric expert in regulatory authority panels and in FDA, EMEA, and BfArM hearings. He is head of the multidimensional section at the institute for Data Analysis and Study Planning and statistical peer reviewer for leading medical journals.

Since 2013 Elected Member of the International Scientific Committee of the Society for the Study of Neuroprotection and Neuroplasticity (SSNN).

Since 2013 Elected Member of the World Academy for Multidisciplinary Neurotraumatology (AMN).



## *KEVIN WANG*

*USA*

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Dr. Kevin Wang has 25 years of unique combination of experience in drug discovery and development in pharmaceutical industry, basic and clinical research in academia, and founding and managing a biotechnology/diagnostic company.

Upon obtaining his Ph.D. in Pharmaceutical Sciences with Distinction from the University of British Columbia (Vancouver) in 1989 and finishing a postdoctoral fellowship (Pathology) at Wayne State University (Detroit) in 1991, Dr. Wang joined Parke-Davis Pharmaceutical Research (Ann Arbor) in 1991, and joined Pfizer Inc. followed its' merger with Parke-Davis (2000). He rose through the rank to become Group Leader of CNS Therapeutics and Co-Chair the CNS New Targets Team. One of the projects that he led had resulted in a Lead Compound candidate. Meanwhile, he also co-chaired the Far East Scientific Opportunity Team. In 2002, he transitioned to academia and became Associate Professor of Psychiatry at the University of Florida (Gainesville, FL) and Associate Director of the Center for Traumatic Brain Injury Studies. In 2002, he co-founded Banyan Biomarkers Inc. (Alachua, FL). In 2007, he transitioned to Banyan as full-time Chief Scientific Officer and Director of its Center of Innovative Research, where he oversaw a team of more than 30 PhD, MS and BSc scientists and staff. Dr. Wang has contributed significantly to the discovery and product development of two acute brain injury protein biomarkers (UCH-L1 and GFAP) and their diagnostic utility characterization in several animal and human brain injury studies. This biomarker tandem is now in pivotal study for FDA approval as a first-in-class in vitro diagnostic (IVD) test for mild-moderate traumatic brain injury (ALERT Trial). In 2011, he rejoined the University of Florida McKnight Brain Institute as Director of the Program for Neurotrauma, Neuroproteomics & Biomarkers Research / Associate Professor of Psychiatry, Neuroscience and Physiological Science, where he continues basic and translational research in neurotherapeutics and neurodiagnostics. He is also Chair Professor of Neurosurgery at the Taipei Medical University. Dr. Wang is internationally recognized for his original contributions to the fields of CNS disorders-linked drug targets, neuroproteomics and disease biomarker discovery. Dr. Wang published more than 220 peer-reviewed papers, reviews and book chapters and co-authored 12 US and international patents. He co-edited four books on the topics that range from proteases, neuroproteomics to biomarkers for CNS disorders. He is Associate Editor of two journals - Translational Proteomics and Frontiers in Neurotrauma. He also serves on five international journals' Editorial Board. Dr. Wang was Past President and is current Council Member of the National Neurotrauma Society (USA). His research interests include Neuro-Proteomics, Systems Biology, brain and spinal cord Injury, chronic traumatic encephalopathy (CTE), Tauopathy, Neurodegeneration, substance abuse research, Post-translational modification (Protease / Protein Kinase) research, Biomarkers, Diagnostics and Therapeutic development.



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