

STUDY CENTRES
and RESEARCH
LABORATORIES

Centres

“G.M. CORSINO” CENTRE FOR THE DIAGNOSIS AND TREATMENT OF EPILEPSY

Director: Prof. Paolo Tinuper

Tel: 051.2092994; E-mail: c_epil@neuro.unibo.it

Aims: The Department's Epilepsy Centre was set up in 1974. Around 4000 adults and children are currently followed at the Centre with 1800 examinations a year. Access is by National Health Service referral. Patients are seen as outpatients with a first examination and periodic follow-ups. Routine electroencephalographic, video-EEG and prolonged video-polygraphic recordings are done at the Clinical Encephalography Laboratory both in wakefulness and during afternoon sleep. In addition, CT scans and measurement of antiepileptic drug plasma levels are undertaken at the Centre. Patients requiring differential diagnosis with other paroxysmal episodes or those with drug-resistant epilepsy requiring complex therapy adjustments or neurosurgical candidates needing prolonged video-polygraphic monitoring are admitted to the Department wards. In addition to healthcare activity, staff at the Centre carry out clinical and pharmacological research on all aspects of epileptology.

Main research topics: the prognostic factors involved in drug-resistant epilepsies; suspension of antiepileptic treatment; clinical features and prognosis of seizures with sudden falls; autonomic changes during epileptic seizures; epilepsies with seizures during sleep; genetically transmitted epilepsies; epilepsies resulting from impaired cortical development; epilepsies in the elderly; drug-resistant epilepsies; epilepsies subject to surgical management; clinical trials of new antiepileptic drugs. Research findings are presented and national and international scientific meetings and published in specialist journals. The Centre currently works in association with the Epilepsy Centre of Bellaria Hospital, Bologna, and the “Claudio Munari” Centre for Epilepsy Surgery at Niguarda Hospital, Milan, where patients with drug-resistant epilepsy are referred for surgery.

Teaching: Throughout the year the Centre is attended by visiting doctors and researchers for periods of training during which they take part in all the Centre's activities. The Centre is also one of the facilities used for training postgraduate students enrolled in the University of Bologna School of Neurology. The Centre is recognized by the Italian League against Epilepsy (LICE) and is part of the European Epilepsy Academy (EUREPA) teaching network.

**CENTRE FOR THE STUDY AND
TREATMENT OF HEADACHE AND
FACIAL PAIN**

Director: Prof. Pasquale Montagna
Tel: (outpatient clinics) 051.2092990;
E-mail: centro.cefalce@neuro.unibo.it

Aims: The Centre for the Study and Treatment of Headache and Facial Pain ("Headache Centre") was set up by decree of Bologna University's Chancellor on 14th September 1981 to foster research in the field of headache and craniofacial pain, namely investigating the pathophysiological mechanisms, genetics and epidemiology, pharmacological problems and conducting experimental drug trials. The Headache Centre runs an outpatients' clinic open twice a week to patients with highly complex diagnostic or therapeutic problems referred to the Centre by general practitioners, neurologists and other neurological departments. The Headache Centre undertakes scientific research in association with other Centres and Laboratories at the Department of Neurological Sciences including the Laboratory of Clinical Neuropharmacology, the Laboratory of Neurogenetics (nuclear mutations, mitochondrial diseases), the Laboratory for Functional Exploration of the Autonomic Nervous System, the Laboratory of Neuroepidemiology and the Laboratory of Neurophysiopathology.

Main research topics: clinical, genetic, molecular and therapeutic aspects of primary headache, and the protocol for the management of headache in an emergency setting. Much international interest was aroused after the Centre paved the way to a new interpretation of the mechanisms underlying the migrainous brain, studying phosphorus brain energy metabolism in primary headache by magnetic resonance spectroscopy and currently with the ongoing investigation into the anatomofunctional activity of the hypothalamus using proton magnetic resonance spectroscopy in patients with cluster headache (in association with the Bologna University "D. Campanacci" Department of Clinical Medicine and Applied Biotechnology).

Teaching: the Centre has organized 15 update courses for neurologists and general practitioners, and one meeting in association with the Italian Association against Headache (AIC) aimed at doctors, politicians and patients involved in the management of headache.

The Headache Centre currently works in association with other local and regional external research and care centres (University of Bologna Departments of Clinical Medicine and Paediatric Cardiology and Heart Surgery, National Health Service Psychiatric Service in Bologna and elsewhere) and other institutions in Italy (Besta Neurology Institute, Milan, Parma University Headache Centre, Human Molecular Genetics Unit, San Raffaele Hospital, Milan) and abroad (Department of Neurology, University of Munich, Department of Neurology, Veterans Administration Hospital, Pittsburgh, USA).

**CENTRE FOR THE STUDY OF
EXTRAPYRAMIDAL DISEASES and
INTERUNIVERSITY RESEARCH CENTRE
ON MOVEMENT DISORDERS**

Director: Prof. Paolo Martinelli

Tel: 051.2092950; E-mail: paolo.martinelli@unibo.it

Aim of the Centres is research into the clinical, pathophysiological and therapeutic aspects of movement disorders. The Centres' research topics include the clinical characterization of kinetic-dynamic parameters of L-dopa response, the genetics of dopamine transporters, comparison of neuropharmacological techniques and functional neuroimaging in assessing progression in early onset Parkinson's disease, 1H Spectroscopy of basal ganglion disease and essential tremor, the genetic characterization of essential tremor and of diseases related to the parkin gene, and the quali-quantitative assessment of RBD in Parkinson's disease. The Centres have links with the following Department facilities: Clinical Neuropharmacology Laboratory, Genetics Laboratory, Polysomnography Laboratory, Electromyography Laboratory, and other University facilities like the Department of Applied Biochemistry. The Centres are currently working in association with the Besta Institute (Milan), Catholic University (Rome), Centres for the Study of Movement Disorders at the Universities of Genoa, Parma and Pisa, The Institute of Genetics, Genoa and the Department of Neurology, Lubeca (Germany).

**CENTRE FOR THE STUDY AND
TREATMENT OF SLEEP DISORDERS**

Director: Prof. Pasquale Montagna

Tel: (Outpatients) 051.2092990

Aims: The Centre for the Study and Treatment of Sleep Disorders ("Sleep Centre") is devoted to research in the field of sleep medicine conducted at the facilities available at the Department of Neurological Sciences (outpatients clinic, Polysomnography Laboratory, wards) aimed at the diagnosis, treatment and long-term monitoring of sleep disorders. The Centre also works in conjunction with specialists from other disciplines (maxillofacial surgeons, psychologists, psychiatrists, cardiologists, nutritionists, pneumologists and otolaryngologists) to ensure an all-round multidisciplinary approach to the different sleep disorders.

Main research topics: The Sleep Centre's clinical research focuses on the clinical and epidemiological polysomnographic characterization of sleep disorders and the polysomnographic investigation of neurological diseases. Past and ongoing research projects include studies on: obstructive sleep apnea syndrome, nocturnal frontal lobe epilepsy, epidemiology of sleep disorders, diagnosis and epidemiology of narcolepsy, new parasomnias (proprioceptional

myoclonus, oromandibular myoclonus, catathrenia, fragmentary excessive myoclonus), restless legs syndrome, agrypnia excitata (clinical, polysomnographic and anatomopathological characterization) and description of different clinical conditions (delirium tremens, Morvan's chorea, fatal familial insomnia, brain stem lesions), sleep disorders in multisystem atrophy, lesional forms of REM behaviour disorder, feeding behaviour disorders in sleep, the study of circadian rhythms in multisystem atrophy, Parkinson's disease, fatal familial insomnia and cluster headache

External links: The Centre has ongoing links with other institutions in Italy (Prof. Claudio Vicini, ORL Unit, Pierantoni Hospital, Forli; Prof. Alberto Cicognani, Department of Medicine and Public Health, University of Bologna; Prof. Carlo Cipolli and Dr. Michela Mazzetti, Department of Psychology, University of Bologna; Dr. Luigi Ferini Strambi, Sleep Centre, S. Raffaele Hospital, Milan; Prof. Franco Ferrillo and Dr. Lino Nobili, Sleep centre, University of Genoa; Prof. Luciano Stegagno, Faculty of Psychology, University of Padua) and abroad (Prof. Emanuel Mignot, Narcolepsy Center, Stanford University, USA; Prof. Maurice Ohayon, Sleep Epidemiology, Stanford University, USA).

**UNIVERSITY CENTRE FOR THE
NEUROLOGICAL STUDY OF
CEREBRAL AGEING**

Director: Dr. Roberto Gallassi

Tel: 051.2092763; Fax 051.2092761;

E-mail: invecch@alma.unibo.it; gallassi@neuro.unibo.it

Aims: the clinical, instrumental and neuropsychological diagnosis of patients with cognitive and behavioural problems and the related treatment strategies; medico-legal certification; support and advice for caregivers.

Main research topics: The diagnostic work-up of dementia and neuropsychological assessment devising standard tests, test batteries and computer case records; the epidemiological assessment and cognitive profile of different forms of dementia; clinical, instrumental and cognitive profile and epidemiological and prognostic assessment of patients with subjective memory complaints and mild cognitive impairment; cognitive disorders and psychomotor performance in neurological diseases focusing on sleep disorders; the cognitive effects of depression and depression comorbidity and dementia; study of memory disorders, especially transient memory impairment in different diseases including epilepsy; clinical and neuropsychological trials of new drugs, namely in the treatment of dementia.

External links: The Centre works in association with other regional neurology centres belonging to the Emilia-Romagna "Cognitive and Behavioural Neurology Group"; the Alzheimer Centre and

Assessment Unit appointed by the Bologna Primary Care Trust for the “Cronos” project for the controlled administration of anticholinesterase drugs and planning therapeutic trials of atypical antipsychotic drugs; the Centre is part of the Emilia-Romagna Region's Regional Dementia Project and is a training and reference centre for the neuropsychological assessment of psychologists (Faculty of Psychology postgraduate training) and other specialists (neurologists, geriatricians, etc.).

**CENTRE FOR MENTAL RETARDATION AND
LEARNING AND LANGUAGE DISORDERS**

Director: Dr. Margherita Santucci

Tel: 051.2092974, 051.2092973; Fax: 051.2092769;

E-mail: margherita.santucci@unibo.it

Aims: The study of children with mental retardation, learning and language disorders aimed at diagnostic, clinical and etiological classification, functional assessment, treatment and rehabilitation. Scientific and research activity is linked to healthcare in the ward and outpatients' clinic of the Child Neuropsychiatry division.

Main research topics. One of the prime research area is the study of cognitive disorders and learning and languages disorders in childhood epilepsies and in children with EEG epileptiform abnormalities. A high proportion of children with epilepsy present clinically significant neuropsychological disorders affecting their quality of life. These disorders are closely correlated to seizures and/or EEG abnormalities and should be addressed in prescribing treatment and in assessing surgical candidates. The main research topics are the neuropsychology of epilepsies with continuous spike-waves during sleep (including Landau-Kleffner syndrome); idiopathic partial epilepsies and learning and neuropsychological disorders in general, cerebral malformations epilepsy and cognitive disorders, cognitive functioning in rare diseases like chromosome aberrations, genetic diseases and metabolic diseases. Research findings have been published and presented at congresses and included in local and national research projects.

The Centre has links with the Child Neuropsychology Laboratory and works in association with the Department's Neurophysiopathology, Neuroradiology and Neurogenetics services.

**CENTRE FOR AUTISM: RESEARCH,
DIAGNOSIS AND TREATMENT**

Director:: Prof. Antonia Parmeggiani

Tel: 051.2092973, 051.2092974; Fax 051.2092769;

E-mail: antonia.parmeggiani@unibo.it

Aims: Autism is a chronic developmental disorder with onset in

childhood. Autism is an umbrella term comprising different diseases within the spectrum of pervasive developmental disorders as defined by DSM-IV (1994) including autistic disorder, Asperger's syndrome, Rett's syndrome, childhood disintegrative disorder and pervasive development disorder not otherwise specified. The Centre continues its research activity and patient care established at this facility in 1987. In addition to diagnosis, the Centre offers rehabilitation and drug management programmes aimed at attenuating symptoms and fostering social integration. For its healthcare and scientific activity the Centre has a regular ward, a child neuropsychiatry outpatient service, a Child Neuropsychology Laboratory and various Departmental facilities, namely the Laboratory for Neurogenetic Diseases and the Clinical Electroencephalography Laboratory.

Main research topics: research findings have been published in national and international journals, also used to devise external cooperation and research projects (government funding; Young Researchers Project). Research focuses on: etiopathogenesis, comorbidity, mainly epilepsy, neurophysiological and neuropsychological features, evolution and treatment.

External links: Ongoing target research project RF 1/01 (2002) IRCCS Stella Maris Foundation Pisa “Neurobiological mechanisms underlying autism, new methods of diagnostic assessment and drug management strategies”.

**CENTRE FOR THE STUDY AND
TREATMENT OF
NEUROMUSCULAR DISEASES**

Director: Dr. Rocco Liguori

Tel: (Outpatients) 051-2092990, 051.2092989; E-mail:
rocco.liguori@unibo.it

Aims: The Centre undertakes scientific and healthcare activity aimed at the diagnosis and treatment of neuromuscular diseases integrating clinical, neurophysiological and histopathological features. The neuromuscular diseases comprise a group of illnesses involving the nervous system and muscular apparatus of the skeleton varying widely in epidemiology and clinical features. For some diagnosis is established by routine neurophysiological and blood tests, others require more complex examinations like histological, biochemical, immunological and molecular analysis. Patients with focal dystonias are also referred to the Centre for Botulin Toxin Treatment.

The Centre's main aims are:

- Preventive action to decrease the incidence and prevalence of neuromuscular disease by promoting health and appropriate patient management;
- To offer a highly specialist service devoted to neuromuscular diseases entailing complex diagnosis and management.

The Centre runs an outpatients' clinic (specialist clinic for neuromuscular diseases), a laboratory (neurophysiological diagnosis with EMG, evoked potentials and microneurography and neurobiological diagnosis with skin, muscle and nerve biopsy, histopathology and genetic and biochemical analysis) and admission of patients to the Neurology Clinic ward.

Main research topics:

- Neurophysiological and histopathological characterization of neuromuscular diseases
 - New clinical indications for botulin toxin treatment
 - Study of neuromuscular diseases caused by ion channel changes
- Research is also conducted in association with other national (Besta Neurological Institute, Milan; S.Raffaele Institute, Milan; Federico II Hospital, University of Naples) and international institutions (Institute of Molecular Medicine, John Radcliffe Hospital, University of Oxford, UK; Department of Clinical Neurophysiology, University of Goteborg, Sweden).

**CENTRE FOR THE STUDY AND DIAGNOSIS
OF NEUROGENETIC DISEASES**

Director: Dr. Valerio Carelli

Tel: 051-2092743; E-mail carelli@neuro.unibo.it;
genetica@neuro.unibo.it

The Centre, set up in 2004 to coordinate the study, diagnosis and treatment of neurogenetic diseases pursued by the Department since 1980, runs a general neurology outpatients' clinic, patient admission and laboratory analysis. A specialist outpatients' service is about to open for the study of genetically transmitted neurological diseases.

The Centre works in association with other Departmental facilities: Centre for the Study of Headache and Facial Pain, Centre for the Diagnosis and Treatment of Epilepsy, Centre for the Study and Treatment of Neuromuscular Diseases, Centre for the Study of Extrapyrarnidal Diseases, Centre for Autism and the Centre for the Study and Treatment of Sleep Disorders. Patients requiring differential diagnosis and those with conditions of special scientific interest are admitted to the Department wards.

Healthcare is closely linked to scientific research and undertaken at an outpatients' clinic and a three-tier diagnostic laboratory comprising histological, biochemical and molecular analysis of disease groupings:

- mitochondrial diseases
- genetics of migraine and channelopathies (research only)
- repeats diseases
- storage diseases, mental retardation, Parkinson's disease

Research focuses on neurodegenerative and neuromuscular diseases,

namely mitochondrial diseases. Current procedures focus on extracting DNA from tissues, PCR amplification of DNA fragments, analysis of restriction fragments, direct DNA sequencing and screening large series by DHPLC. The main approaches are mutational analysis to identify the mutations responsible for the diseases studied, study of SNPs (single nucleotide polymorphisms), population and genetic association studies and the identification of new genes/diseases. Research is funded by public (European Union, government and university) and private grants (Telethon and other private foundations).

The Centre works in association with many national and international institutions, being involved in cell biology, magnetic resonance imaging and spectroscopy studies and in laboratory networks focused on developing new therapeutic strategies. Research findings are published in high impact factor international journals and presented at national and international meetings.

Laboratories

CLINICAL ELECTROENCEPHALOGRAPHY LABORATORY

Coordinator: Prof. Paolo Tinuper
Tel: 051.2092965; E-mail: ecg@neuro.unibo.it

Equipment: The laboratory has two rooms equipped with analogical polygraphs, audio and video recording systems, a computer for off-line signal analysis, a secretary-reception room and a report room.

Healthcare comprises:

- Routine EEG for outpatients referred by the Department of Neurological Sciences Clinic and patients admitted to the Neurology and Child Neuropsychiatry wards.
 - EEG after sleep deprivation for inpatients and outpatients
 - Prolonged EEG during afternoon sleep
 - Prolonged videopolygraphic recording for preoperative monitoring of patients with drug-resistant epilepsy
 - Polygraphy with additional extracerebral parameters
- For a total of 2700 examinations/year (of which 400 recordings using special methods)

Research focuses on the study of:

- Neurophysiology of seizures with sudden falls
- Cortical correlates of myoclonias
- Changes in neuro-autonomic parameters during epileptic seizures
- Seizure semeiology of partial epilepsies
- EEG changes during suspension of antiepileptic treatment

The Laboratory is used for training of postgraduate neurology students and students enrolled in the Degree Course for Neurophysiopathology Technicians

POLYSOMNOGRAPHY LABORATORY

Coordinator: Dr. Giuseppe Plazzi

Tel: 051.2092920 E-mail: giuseppe.plazzi@unibo.it

Equipment: The Laboratory has two air-conditioned rooms for sleep recording under audio and video control, a patient preparation room communicating with a monitoring room next to the recording room and equipped with analogical and digital devices for simultaneous recording of polysomnographic parameters. The Laboratory also has equipment for dynamic recording (in inpatients and at home) of the sleep-wake rhythm, breathing disorders during sleep, and motor activity.

Healthcare: The Laboratory is equipped for the instrumental diagnosis of all sleep disorders, impaired circadian rhythm, the ventilatory treatment of sleep-related breathing disorders and polygraphic assessment of daytime somnolence. Patients undergo polysomnography after clinical examination as outpatients as the wide variety of sleep disorders requires different instrumental diagnostic procedures. Clinical assessment by a sleep specialist optimizes the diagnostic work-up. The main disorders requiring polysomnographic investigation are: 1) breathing disorders during sleep (e.g., obstructive sleep apnea syndrome), 2) excessive daytime somnolence (e.g., narcolepsy and idiopathic hypersomnia); 3) movement disorders during sleep (e.g., nonREM and REM sleep parasomnias, nocturnal epilepsy, restless legs syndrome and myoclonic events during sleep), 4) insomnia and circadian rhythm disorders.

Research: the research activity undertaken at the Polysomnography Laboratory is described together with the activities of the Centre for the Study and treatment of Sleep Disorders.

Teaching: The Laboratory is used for training students enrolled in the Degree Course for Neurophysiopathology Technicians and the Research Doctorate in Sleep Medicine.

NEUROEPIDEMIOLOGY LABORATORY

Coordinator: Dr. Roberto D'Alessandro

Tel: 051.2092935; E-mail: dalessan@neuro.unibo.it

Equipment: computer programmes for advanced statistical analysis.

Research: The Laboratory deals with the descriptive, analytical and experimental epidemiology of neurological diseases. Since 1985 the Laboratory has been researching the epidemiology of headache, epilepsies, dementia, sleep disorders, inflammatory neuropathies, myasthenia, neurological signs in liver and bone marrow transplant recipients, concordance between observers, Parkinson's disease and other movement disorders, cerebrovascular diseases, childhood mental retardation, motor neurone disease and brain tumours. Research activity is planned in independent projects and supporting other groups. Within the Department of Neurological Sciences the Laboratory works in association with the Centre for the Study and Treatment of Headache, the Interuniversity Centre for Research on Movement Disorders, the Centre for the Diagnosis and Treatment of Epilepsy and the Centre for the Study and Treatment of Sleep Disorders. In the Emilia-Romagna Region the Laboratory has coordinated studies on the epidemiology of epilepsy, myasthenia, Guillain-Barré syndrome in association with other neurology services. On a national scale the Laboratory has worked with the Besta Neurology Institute in Milan (motor neurone disease), IRCSS OASI Hospital, Troina (dementia), Mario Negri Institute, Milan (assessment of quality of life in sleep disorders), and promoted the TIGI study (Italian Trial on Glycerol in Stroke). The Laboratory coordinated the national GINSEN study (Italian Narcolepsy Group National Epidemiological Study) and works at international level in association with the Cochrane Group.

The Laboratory is currently coordinating a regional group on the epidemiology of acquired demyelinating polyneuropathies; a prospective study on the long-term prognosis of narcolepsy (in association with the Department's Centre for the Study and Treatment of Sleep Disorders); a study on the familial aggregation of parasomnias in nocturnal frontal lobe epilepsy (with the Department's Centre for the Study and Treatment of Epilepsy); a regional prospective study on the prognosis of monosymptomatic forms of multiple sclerosis.

Teaching: lectures on epidemiology and evidence based medicine in the Postgraduate School of Neurology.

**CLINICAL NEUROPHYSIOLOGY
LABORATORIES: EMG,
MICRONEUROGRAPHY,
EVOKED POTENTIALS**

Coordinator: Dr. Rocco Liguori
Tel: (secretary) 051.2092915;
E-mail: rocco.liguori@unibo.it

Equipment: The three laboratories are equipped with electromyographic instrumentation with video-recording and equipment for multimodal evoked potentials. In addition, the

Microneurography Laboratory has a system for the non-invasive measurement of arterial pressure (Finometer) and devices for the exploration of muscle and skin sympathetic activity.

Healthcare: The Laboratories undertake the neurophysiological diagnosis of neuromuscular and dysautonomic diseases.

Research: studies on habituation of the skin sympathetic system to repeated arousal stimuli, the pathogenetic role of muscular sympathetic activity in daytime hypertension in patients with obstructive sleep apnea syndrome (OSAS) and in episodes of syncope in patients with neuromediated syncope linked to emotional stimuli. In addition, the Microneurography Laboratory is developing an immunohistochemical method for skin biopsy in two research projects on the effects of botulin toxin treatment on skin innervation and the differentiation and quantification of cutaneous autonomic adrenergic and cholinergic nerve fibres. The EMG and Evoked Potentials Laboratories are involved in research projects on the neuromuscular changes encountered in different neurological diseases (e.g., mitochondrial diseases) and sympathetic system dysfunction underlying the dysautonomia characterizing neurological and cardiac diseases. For these reasons, the Laboratories are directly linked with the Centre for the Study and Treatment of Neuromuscular Diseases. The Laboratories are involved in major research projects with various national and international institutions including the Departments of Clinical Neurophysiology, Physiology and Neuropharmacology at the University of Goteborg (Sweden), Department of Physiology, University of Bologna and the Maugeri Foundation, Telese Terme.

Teaching: Lectures on the diseases investigated in the Laboratory are held for students enrolled in Medicine and in the Degree Course for Neurophysiopathology Technicians and in the Postgraduate Schools of Neurology and Physical Medicine.

ELECTROMYOGRAPHY LABORATORY

Coordinator: Prof. Paolo Martinelli

Tel. 051.2092919; E-mail: paolo.martinelli@unibo.it

Healthcare is administered with a MEDELEC MS60 electromyograph to inpatients admitted to the Department wards and outpatients with neuromuscular diseases

Research focuses on the assessment of spinal reflex activity with equipment comprising an armchair custom-made to maintain constant angle ratios between the joint segments of the inferior limbs or adjust them to predetermined reciprocal angulations, a MEDELEC MS8 electromyography coupled with a Grass S 88 stimulator able to emit simple and complex stimuli in prefixed or

random sequences, a Bruel and Kjaer Vibration Exciter type 4809, a second Bruel and Kjaer "Mini Shaker type 4810" vibrator fitted on a flexible apparatus both guided by the Grass stimulator, a Biopack MP 150 recording apparatus to acquire electrophysiological signals according to prefixed sequences and automatically analyze (Light_RM 5.0.1 programme developed by Spark S.r.L.) the basic parameters and build excitability curves. Research activity is based on prefixed protocols: the Laboratory currently has links with the Department's Centre for the Study of Extrapiramidal Diseases and the Centre for the Study and Treatment of Sleep Disorders. The main research topics include: regulation of type 1b inhibition in early onset Parkinson's Disease, organization of joint polysynaptic activity in Parkinsonian syndromes and restless legs syndrome, assessment of antagonist inhibition evoked in different ways in normal subjects.

Teaching: lectures to students enrolled in the Degree Course in Medicine and students at the Postgraduate Schools of Neurology, Child Neuropsychiatry, Physical and Rehabilitation Medicine and students in the Degree Course for Neurophysiopathology Technicians

**LABORATORY FOR FUNCTIONAL
EXPLORATION OF THE AUTONOMIC
NERVOUS SYSTEM**

Coordinator: Prof. Pietro Cortelli

Tel: 051.2092968; E-mail: snv@neuro.unibo.it

Equipment: Polygraphic and videopolygraphic systems including portable devices with automatic acquisition and analysis of neurophysiological and cardiovascular signals. Portable devices for continuous monitoring of arterial pressure and heart rate (Portapres) and continuous monitoring of internal body temperature (Mini-Logger). "Task Force Monitor" system for quantitative analysis of cardiovascular parameters and baroreceptor reflex gain. Automatic control system assessing the performance of cardiovascular tests (tilt test, Valsalva manoeuvre, deep breathing, isometric exercise). Digital photographic system for the dynamic study of the pupillary system. A room for the study of circadian rhythms of internal body temperature, arterial pressure and heart rate in relation to the wake-sleep rhythm under controlled environmental conditions of temperature, humidity and light.

Healthcare mainly concerns the diagnosis and treatment of patients with transient episodes of loss of consciousness (syncope), orthostatic hypotension (in conjunction with the Laboratory of Clinical Neuropharmacology), heat regulation disorders, papillary and lacrimation disorders, autonomic biorhythm disorders, impaired autonomic control of the cardiovascular system and

intractable arterial hypertension.

Research: Clinical, epidemiological and pathophysiological aspects of neurological diseases with acute and chronic dysautonomia (neuropharmacology of neurogenic orthostatic hypotension, neuromediated syncope, autonomic disorders associated with epileptic seizures).

- Autonomic control of the cardiovascular system and the study of circadian rhythms of arterial pressure, heart rate, temperature and major hormones in degenerative diseases of the central nervous system and prion diseases.
- Autonomic mechanisms underlying systemic arterial hypertension in patients with obstructive sleep apnea syndrome.
- Clinical, neurophysiological, autonomic and anatomofunctional correlates in Parkinsonian patients with subthalamic neurostimulation implants and in patients with cluster headache with posterior hypothalamic neurostimulation implants. Research is conducted in conjunction with the Department's Laboratory of Clinical Neuropharmacology, Polysomnography Laboratory and Clinical Electroencephalography Laboratory. In addition the Laboratory works in association with the Centre for the Diagnosis and Treatment of Epilepsy, the Centre for the Study and Treatment of Sleep Disorders, Interuniversity Research Centre on Movement Disorders and the Centre for the Study and Treatment of Headache and Facial Pain.

The Laboratory maintains links with national (different neurology centres in the Emilia-Romagna region; Besta Neurology Institute, Milan; Departments of Clinical Sciences at the Universities of Milan and Turin and Neurological Sciences at the Universities of Genoa, Rome-Cattolica and Rome-Sapienza; CNR-IBIM Centres of Clinical Epidemiology and Pathophysiology of Kidney Diseases and Arterial Hypertension, Reggio Calabria, etc.) and international institutions (Prof. C.J. Mathias, Neurovascular Medicine Unit, Imperial College of London, UK; Prof. Jean-Michel Senard, Laboratoire de Pharmacologie, INSERM U317, Toulouse, France; Prof. Max J. Hilz, Clinical Neurophysiology, University Erlangen-Nuremberg, Erlangen, Germany; Dr. Heinz Lahrmann, Dept. of Neurology, Kaiser Franz Josef Hospital, Wien, Austria; Prof. J.G. van Dijk, Academisch Ziekenhuis Neurology, Leiden, Netherlands; Dr. H. Kaufmann, Mount Sinai School of Medicine, Dept. of Neurology, New York, USA).

Teaching: The Laboratory is open to undergraduate and postgraduate students for experimental theses and training periods and also holds residential courses and scientific meetings on topics related to the study and treatment of autonomic nervous system disorders.

**CLINICAL NEUROPHARMACOLOGY
LABORATORY**

Coordinator: Dr. Fiorenzo Albani

Tel: 051.2092750 E-mail: farmaco@neuro.unibo.it

The Laboratory is devoted to the study of clinical neuropharmacology of neurological drugs and the role of neuromediators in neurological disease. In thirty years of activity the laboratory has conducted studies on more than 25 drugs and endogenous compounds, devising 15 original methods of analysis in biological matrices resulting in the publication of more than 130 scientific papers.

Equipment: The Laboratory is equipped with state-of-the-art analytical devices for the chromatographic analysis of drugs with different detection systems including a mass spectroscopy detector. Analytical data are acquired and managed by a network computer system allowing remote control of instrumentation.

Healthcare consists in kinetic-dynamic monitoring of pharmacological treatment in patients with epilepsy and Parkinson's disease.

Main research topics: antiepileptic drugs and the treatment of epilepsies; levodopa and the treatment of Parkinson's disease; drugs for sleep disorders; drugs for the treatment of headache and the prevention of migraine; pharmacokinetic and bioavailability studies; the role of catecholamines in CNS and ANS diseases; clinical trials of new drugs and commercially available drugs in new applications; the development of new instrumental methods for the measurement of drug effects.

The Laboratory works in conjunction with the Centre for the Study of Extrapyramidal Diseases and the Centre for the Diagnosis and Treatment of Epilepsy and is closely linked to all of the Department's care and research facilities. In addition, the Laboratory is currently working in association with the Regina Elena Tumour Institute, Rome (Prof. Jandolo, Dr. Maschio), Oasi IRCCS, Troina, Enna (Prof. M. Cioni) and Verifax Corporation, Boulder, CO, USA (Dr. R. Shrairman).

Teaching: The Laboratory has hosted many Italian and foreign academics and researchers for periods of training or study lasting from one to twelve months. The Laboratory provides a consultancy service on neurological drugs to National Health specialists in the Emilia-Romagna region and publishes a drugs update bulletin for Departmental personnel.

NEUROPATHOLOGY LABORATORY

Coordinator: Dr. Piero Parchi

Tel: (Office) 051.2092740, (Laboratory) 051.2092741;

E-mail: parchi@neuro.unibo.it

Main equipment: three biohazard laminar flow hoods type IIB, an ultrasonicator, a preparatory ultracentrifuge, an automatic sequencer and a DHPLC system for nucleic acid sequence and analysis (these two devices shared with the Laboratories of Neurogenetics).

Healthcare: genetic, biochemical and histopathological analysis on biological fluids (CSF and blood) and autoptic specimens for diagnostic confirmation of suspect cases of transmissible spongiform encephalopathies and other neurodegenerative diseases (Alzheimer's, frontotemporal dementia, sinucleinopathies, etc.). The Laboratory conducts molecular diagnostic and neuropathological diagnosis for the National Registry of Creutzfeldt-Jakob Disease and Correlated Syndromes under an agreement with the General Medical Council.

Research: is focused on transmissible spongiform encephalopathies or prion diseases. Ongoing research aims to enhance our knowledge of the molecular pathology of these diseases and the genetic mechanisms underlying individual susceptibility. Current research projects concern: 1) Definition of the entire spectrum of clinical and pathological phenotypes of human prion diseases and the molecular bases of such variability; 2) Study of the genetic mechanisms underlying individual susceptibility and phenotypical disease expression; 3) Definition of the molecular bases of prion strain diversity; 4) Development of rapid sensitive analysis methods for strain specific molecular diagnosis of Creutzfeldt-Jakob disease; 5) Animal model study of the physical-chemical characteristics of pathological prion protein extracted from peripheral tissues; 6) Study of the strain specific epidemiology of Creutzfeldt-Jakob disease in Italy.

The Laboratory's research activity is funded by national and European bodies and conducted in conjunction with national and international institutions including the Brain-Net Europe II and Neuroprion networks funded by the European Union. The Laboratory has links with: 1) Prof. M. Pocchiari, Virology Laboratory, General Medical Council, Rome; 2) Dr. U. Agrimi, Veterinary Medicine Laboratory, General Medical Council, Rome; 3) Prof. H. Kretzschmar, Dr. A. Giese, Institute fuer Neuropathologie, LM-Universitaet, Muenchen, Germany; 4) Prof. P. Gambetti, Division of Neuropathology, CWRU, Cleveland, OH, USA; 5) Prof. B. Ghetti, Institute of Pathology, Indiana University, Indianapolis, IN, USA; 6) Dr. J. Grassi, Service de Pharmacologie et d'Immunologie, CEA, Gif sur Ivette, France; 7) Dr. C. Lasmezas,

Département de Recherche Médicale, Service de Neurovirologie, Fontenay-aux-Roses, France; 8) Dr. M. Beekes, Robert-Koch-Institut, Berlin, Germany.

NEUROGENETICS LABORATORY

Coordinator: Dr. Valerio Carelli

Tel. (office) 051.2092743 - (laboratory) 051.2092742

E-mail: genetica@neuro.unibo.it

Main equipment: four PCR devices, an automatic DNA sequencer model ABI Prism 310, a DHPLC system for nucleic acid analysis (shared), a spectrophotometer, a fluorometer, two refrigerated centrifuges and a cryostat.

Healthcare: Histological, biochemical and molecular tests for the diagnosis of mitochondrial, lysosomal storage and neurodegenerative diseases.

Research: Identification of new pathological mutations in mitochondrial diseases, channelopathies and X-linked mental retardation by DHPLC analysis and sequencing. Assessment of the genetic association between functional polymorphisms to different nuclear genes and hereditary diseases with complex etiology such as migraine, channelopathies, movement disorders and mitochondrial diseases.

Many research projects are conducted in association with other national and international centres.

NEUROPSYCHOLOGY LABORATORY

Coordinator: Dr. Roberto Gallassi

Tel: 051.2092763; Fax 051.2092761;

E-mail: invecch@alma.unibo.it; gallassi@neuro.unibo.it

Equipment: computerized tests for the assessment of psychomotor performance, namely attention and vigilance.

Healthcare: Cognitive-behavioural assessment on patients referred to the University Centre for the Neurological Study of Cerebral Ageing and patients admitted to the wards of the Department of Neurological Sciences.

Research: Research is part of the work undertaken at the University Centre for the Neurological Study of Cerebral Ageing.

Teaching: lectures, training and tutoring for psychologists (Faculty of Psychology); neurologists (Postgraduate School of Neurology), geriatricians (Postgraduate School of Geriatrics);

neurophysiopathology technicians (Degree Course for Neurophysiopathology Technicians) and logopaedic specialists (Degree Course in Logopaedics).

CHILD NEUROPSYCHOLOGY LABORATORY

Coordinator: Prof. Antonia Parmeggiani

Tel: 051.2092979, 051.2092974; Fax: 051.2092769;

E-mail: antonia.parmeggiani@unibo.it

Equipment: neuropsychological tests of intelligence, language, visuospatial skill, attention, memory, executive and practical functions, learning, etc. and psychodiagnostic tests for the assessment of the affective/emotional sphere and behaviour.

Healthcare: the Laboratory investigates children with neuropsychiatric diseases referred for neuropsychological and/or psychodiagnostic assessment including epilepsy, headache, autism, mental retardation, learning and language disorders, developmental and other motor disorders, etc. Care is provided for inpatients in the Department's ward and outpatients attending the Child Neuropsychiatry Clinic, the Autism Centre or the Centre for Mental Retardation and Learning and Language Disorders.

Research: Laboratory research findings have been published in many national and international journals. Main research topics include: idiopathic epilepsies with and without continuous spike-waves in sleep, learning disorders and epilepsy, the neuropsychological and psychiatric characteristics of children with cerebral dysplasia or cerebellar malformation, pervasive developmental disorders, mental retardation and cognitive functioning in rare diseases. Research projects (government funded and target research projects of the Stella Maris IRCCS Foundation) focus on neuropsychological problems in epilepsy, correlated to etiology or drug treatment, pervasive developmental disorders and mental retardation. The Laboratory undertakes research in conjunction with the Centre for Mental Retardation and Learning and Language Disorders.

Teaching: lectures for undergraduate students enrolled in Degree Courses in Medicine and Education and postgraduate students training in Child Neuropsychiatry.