



SANTA LUCIA  
NEUROSCIENZE  
E RIABILITAZIONE

# RESEARCH LINES AND PROJECTS 2016

## RESEARCH LINE A Clinical and Behavioral Neurology

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### Aphasia Research Lab

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- New research methodologies for Aphasia treatment

### Behavioral Neuropsychology Lab

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- ASCEND Studio multicentrico, randomizzato, in doppio cieco, controllato con placebo sull'efficacia di Natalizumab nel ridurre la progressione dell'invalidità in soggetti con sclerosi multipla secondaria progressiva, con estensione in aperto opzionale
- EXCHANGE Studio osservazionale prospettico, multicentrico, per la valutazione della soddisfazione al trattamento con Extavia somministrato attraverso il nuovo autoiniettore Extavipro in pazienti affetti da Sclerosi Multipla
- EXPAND Studio multicentrico, randomizzato, in doppio cieco, a gruppi paralleli, controllato verso placebo, con durata variabile del trattamento per valutare l'efficacia e la sicurezza di siponimod (BAF312) in pazienti con sclerosi multipla secondaria progressiva con estensione in aperto
- MACFIMS Validazione di una batteria per la valutazione neuropsicologica dei pazienti con Sclerosi Multipla
- Ruolo dello stress Lavorativo nel verificarsi di incidenti sul luogo di lavoro in pazienti con SM
- Studio multicentrico per la valutazione multidimensionale (clinica, neuropsicologica e psichiatrica) di pazienti con Sclerosi Multipla e correlazione con dati neuroradiologici di infiammazione e degenerazione

### Epidemiology and Clinical Research (LASERC)

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- Action Observation Treatment (AOT) in pazienti con diagnosi di demenza di alzheimer lieve: correlati cognitivi ed applicabilità nella pratica clinica: studio randomizzato controllato
- A comprehensive preventive program for dementia tailored on the neuropsychological profile of persons with Mild Cognitive Impairment: cognitive stimulation, physical intervention and healthy nutrition, a randomized controlled trial (GR-2013-02356043)
- Delirium Day
- N-terminal truncated A $\beta$ pE3-42 Oligomers and Glutaminyl Cyclase Activity in the Early Diagnosis and Clinical Progression of Typical and Atypical Alzheimer's Disease. A cohort study. (GR-2011-02349822)
- Studio esplorativo, randomizzato e controllato in aperto, sull'efficacia di Gialia® in pazienti con stroke in riabilitazione post-acuta.

### Experimental Neuropsychobiology Lab

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- A2013.02.02: Analisi dei processi immuno-infiammatori e valutazione del loro impatto sulla progressione di malattia in pazienti affetti da malattie neuropsichiatriche
- A2015.03.01: Effetto degli inibitori della colinesterasi sul sistema immunitario dei pazienti affetti da malattia di Alzheimer Delirium Day
- Palmitoylethanolamide to target inflammation in neurodegenerative diseases: a study focused on peripheral immune cells



- RC A2013.01.02. Analisi dei processi immuno-infiammatori e valutazione del loro impatto sulla progressione di malattia in pazienti affetti da malattie neurodegenerative.

### **Experimental Neuropsychophysiology Lab**

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- Cortical dynamics of motor inhibitory control: neurophysiological investigations and clinical applications
- Cortical plasticity in Alzheimer's disease: a TMS-EEG study
- Dopaminergic therapy for Alzheimer's disease patients
- Evaluation by means of cortical excitability TMS / EEG in the early stages of Parkinson's disease
- Fronto-parietal network: assessing cerebral dynamics by means of TMSEEG
- L-dopa induced dyskinesias in Parkinson's disease
- Magnetic stimulation of the precuneus to improve memory in the early stage of Alzheimer's disease
- Promoting motor re-learning in patients with stroke by enhancing non invasively associated cerebellar-cortical plasticity
- The neural markers of post-stroke recovery: tracking the early dynamics of cortical reorganization with a novel longitudinal multimodal approach

### **Genomic Medicine Lab (UILDM)**

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- Development of a medical device for personalized diagnosis of age-related macular degeneration (AMD)
- Phenotypic and molecular characterization of FSHD families: a systematic approach towards trial readiness (GUP13012)

### **Neuropsychiatry Lab**

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- A longitudinal multidimensional study of clinical, neuropsychological, neuroradiologic phenotypes and genetic traits in patients at the onset of psychiatric illness
- Anosognosia in preclinical and clinical Alzheimer disease as an early predictive marker of illness outcome: impact of precocious clinical diagnosis and rehabilitative intervention
- Clinical, neuropsychological, neuroradiologic and genetic evaluation of patients with Attention Deficit/Hyperactivity Disorder (ADHD) compared with control subjects
- Clinical, neuropsychological, neuroradiologic and genetic evaluation of patients with Obsessive-Compulsive Disorder compared with control subjects
- Diagnostic, psychopathological, neuropsychological and morphological phenotyping in patients diagnosed with schizophrenia
- Mhealth platform for Parkinson's disease management - PD\_Manager (The EU Framework Programme for Research and Innovation - HORIZON 2020)
- Modelling recovery after TBI through the longitudinal evaluation of neuroradiologic, neuroinflammatory and behavioral parameters
- Multidimensional assessment of neuropsychological, psychopathological, neuroradiological and genetic features in patients with Mild Cognitive Impairment, Alzheimer disease and comparison with control subjects: longitudinal analysis of the clinical course's predictors
- PICASO: A Personalised Integrated Care Approach for Service Organisations and Care Models for Patients with Multi-Morbidity and Chronic Conditions
- Study of epidemiology of behavioral and cognitive symptoms in patients with movement disorders with and without Deep Brain Stimulation



### **Neuropsychology of Memory Lab**

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- Dopaminergic modulation of declarative memory in individuals with Parkinson's disease
- Mental time travel toward past visual experiences cannot be made without the recollection of associated semantic memories: a study on temporal lobe epilepsy patients.
- Relationship between different aspects of apathy and neuropsychological functioning in dementia
- Subjective organization of word-list learning in different forms of dementia
- The selective impairment explicit semantic knowledge in Alzheimer's disease: a classical and crossmodal semantic priming paradigm

### **Technology and Training Methods for Disability Care Lab**

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- I SUPPORT - ICT-Supported Bath Robots
- RADIO - Robots in assisted living environments

## **RESEARCH LINE B Innovative Methodologies for Rehabilitation**

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### **Computational Methods and Biomechanics of the Hand Lab**

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- Changes in structure and recruitment of muscle synergies after cortical and cerebellar lesions
- Cognitive Interaction in Motion (CogIMon)

### **Visual-Motor Control and Space Microgravity Physiology Lab**

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- ARIANNA: Accident Risk Attenuation in Space Navigation

## **RESEARCH LINE C Preclinical Neuroscience**

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### **Cellular Neurobiology Lab**

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- NADINE (Nanotechnology-based Diagnostics In Neurological diseases and Experimental oncology)
- PATH for ALS P2X7 Antagonists as THERapy for Amyotrophic Lateral Sclerosis

### **Epigenetic Genome Reprogramming Lab**

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- EPIGEN Role of the epigenome in the neuromuscular pathogenesis
- MODHEP Systems biology of liver cancer: an integrative genomicepigenomic approach

### **Epigenetics and Signal Transduction**

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- Dissecting the epigenetic landscape of rhabdomyosarcoma: role of p38alpha kinase in the control of Polycomb Repressive Complex 2
- Epigenetic modifiers in rhabdomyosarcoma

### **Experimental and Behavioral Neurophysiology Lab**

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- Effetti neuroprotettivi dell'arricchimento ambientale e dietetico su correlati di neuroplasticità a livello comportamentale e biochimico

### **Experimental Neurorehabilitation Lab**

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- The endocannabinoid system as a therapeutic target to counteract remote degeneration after spinal cord injury

### **Molecular and Cellular Neurobiology Lab**

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- Regulation of alternative pre-mRNA processing in the pathogenesis of Ewing Sarcoma
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### **Molecular Neurobiology Lab**

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- Risk and Modifying factors in Fronto Temporal Dementia

### **Molecular Neuroscience Lab**

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- Unraveling the mystery of Alzheimer's Disease-related synaptic degeneration

### **Neuroanatomy Lab**

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- Neuroglobin: Neurodegeneration and neuroprotection, role of estrogen hormones induced neuroglobin expression
- Neuroprotective effects of PARP-1 inhibitors

### **Neurobiology of Behavior Lab**

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- Big effects of Small RNAs: the role of miR-34 in Stress-induced psychopathologies
- Post-natal stress affects response to rewarding and aversive stimuli in a genotype-dependent manner in adulthood
- Prelimbic prefrontal cortical norepinephrine modulates extinction of maladaptive memory
- Sepiapterin modulation on neurobehavioral phenotypes and peripheral markers in hyperphenylalaninemia
- The induction of inflammation as result of exposure to traumatic events in childhood: the impact on the vulnerability to psychiatric diseases and traumatic brain injury

### **Neurobiophysics Lab**

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- Analysis of the cortical electrical activity in the G93A genetic model of Amyotrophic Lateral Sclerosis

### **Neurochemistry Lab**

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- OligoALS - New strategies to remove protein aggregates in ALS

### **Neurochemistry of Lipids Lab**

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- Targeting macrophage plasticity and polarization in multiple sclerosis: in/ex vivo veritas

### **Neuroembriology Lab**

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- Deciphering the link between alternative splicing and cell cycle progression in human cancer cells
- Role of alternative splicing in neurodegenerative disease

### **Neurogenetics Lab**

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- Clinical, genetic and functional studies on Joubert syndrome and related disorders (JSRD): a model to understand the complexity of ciliopathies
- Pediatric ataxias and Public Health: epidemiological studies and disease registry, characterization of genetic determinants and implementation of protocols for diagnosis, management, and rehabilitation using innovative low cost, widely accessible technologies
- Understanding the basis of cerebellar and brainstem congenital defects: from clinical and molecular characterisation to the development of a novel neuroembryonic in vitro model

### **Neuroimmunology and Synaptic Plasticity Lab**

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- NARSAD Young Investigator Grant Investigation of the modulatory role of NRG1/ErbB signalling on the glutamatergic transmission in dopaminergic mesencephalic neurons: potential relevance for schizophrenia
- The role of inflammatory cytokines in the pathophysiology of mood disturbances in multiple sclerosis



### **Neuroimmunology Lab**

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- Altered host-virus interaction as cause of multiple sclerosis: focus on Epstein-Barr virus and antiviral immune response
- Comorbidity fra la malattia celiaca e la sclerosi multipla
- Does gut flora influence autoimmune responses in Multiple Sclerosis? The MAIT cell story

### **Neurophysiology and Plasticity Lab**

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- Optogenetic dissection of Striatum-Globus pallidus connection in a model of DYT1 dystonia
- RF-2010-2311657: Recovery of cholinergic neurotransmission dysfunction in DYT1 dystonia - Ripristino della funzione colinergica nella distonia DYT1
- Targeting lipid biology for DYT1 dystonia

### **Neurophysiology Lab**

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- Cell-type and subunit specific alterations of NMDA receptors in striatum at early stages of Parkinson's disease
- Mitochondrial targeting in LRRK2-associated parkinsonism (PARK8)
- Role of serotonin in modulating L-DOPA-induced dyskinesia

### **Proteomics and Metabonomics Lab**

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- Extracellular Signaling in Neuroblastoma through Exosomes for novel drug Targets discovery (ESNET) GR-2011-02350301
- Hydrogen sulphide as a new player of Amyotrophic Lateral Sclerosis
- Looking for new insight on Omega-3 fatty acids role on cognitive decline and brain dysfunctions in age-related disorders GR-2011-02351086
- The mitochondrial Italian Human Proteome Project initiative (mt-HPP)

### **Signal Transduction Lab**

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- GR-2010-2312868 Role of ATM kinase in ErbB2 signaling: a novel therapeutic target to hit ErbB2-positive breast cancer stem cells?

## **RESEARCH LINE D Cognitive and Motor Neurorehabilitation**

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### **Experimental Neurorehabilitation Lab**

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- Fattori prognostici per l'efficacia della terapia robotica nel recupero della deambulazione in pazienti con ictus
- Instrumental analysis of fall-risk in patients with stroke

### **Developmental Dyslexia**

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- Differenze individuali nella fluenza di lettura: effetto dell'età e della dislessia evolutiva

### **Electrophysiology of Cognitive Processes Lab**

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- Benefits of exercise on cognitive processes: possible applications in rehabilitation
- Neural bases of complex actions planning

### **Neuropsychology of Attention Lab**

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- Disturbances of number representation in right brain damage (RBD)
- Functional origin and neural bases of the number-space interaction: fMRI investigations
- Predictive components of attentional orienting in right brain damage and in the healthy brain
- Roles of the temporal-parietal junction (TPJ) and the superior parietal lobule (SPL) in the re-orienting of spatial attention





### **Neuropsychology of Visual-Space and Navigation Disorders Lab**

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- Alterazioni della rappresentazione corporea in pazienti amputati: uno studio di localizzazione e connettività funzionale
- Confronto tra compiti di presa di decisione in situazioni di vita quotidiana e in situazioni di gioco: uno studio su pazienti neurologici e su individui sani
- Guardare con gli occhi della mente: Sistemi neurali distinti per oggetti, ambienti e mappe geografiche
- Rappresentazione mentale della città in pazienti cerebrolesi
- Utilizzo dei punti di repere ambientali: ruolo del linguaggio

### **RESEARCH LINE E Translational Clinical Research**

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#### **Ataxia Research Lab**

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- Anatomico-funzionale correlates of cerebro-cerebellar interactions as assessed by Diffusion Tensor Imaging
- Cerebellar-cortical circuits in Autism Spectrum Disorders: new perspectives for treatment Implementation
- Cerebellar transcranial direct current stimulation and social behavior

#### **Microbial Biofilm Lab**

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- Biofilm growth and antibiotic resistance of bacteria isolated from patients undergoing neuro-rehabilitation.

#### **Multiple Sclerosis Lab**

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- Effetto della stimolazione spinale a corrente continua sul dolore nella sclerosi multipla: valutazione clinica, neurofisiologica e dell'attività del sistema endocannabinoide
- Il ruolo della Stimolazione Elettrica Funzionale per il recupero della deambulazione nei pazienti con malattie neurologiche
- Registro Italiano Sclerosi Multipla

#### **Neuroelectric Imaging and BCI Lab (NEILab)**

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- BrainHack-Bringing the arts and sciences of brain and neural computer interface together

#### **Post-Coma Cranial Trauma Lab**

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- Disturbi del sonno in pazienti con grave cerebrolesione acquisita: natura e possibili effetti sull'outcome riabilitativo
  - Effetti della grave cerebrolesione acquisita (GCA) sulla sfera sessuale, in relazione alla vita di coppia
  - Efficacia del Supporto Psicologico al Caregiver del Paziente con GCA
  - Empatia e disturbi emozionali nel paziente con esiti di grave cerebrolesione acquisita, e il loro possibile effetto sulla qualità della vita del paziente e della sua famiglia
  - Evoluzione della personalità dopo Grave Cerebrolesione Acquisita (GCA)
  - La tecnica della scrittura nei pazienti con esiti di grave Trauma Cranico: impiego della narrazione per promuovere il benessere cognitivo e psicologico
  - Le neuroimmagini morfo-funzionali con risonanza magnetica ad alto campo (3 Tesla) nelle Gravi Cerebrolesioni Acquisite (sindromi postcomatose)
  - Ri-prendersi cura dei propri figli dopo una grave cerebrolesione acquisita
  - Studio dell'effetto framing in pazienti con GCA
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### **Robotic Neurorehabilitation Lab**

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- HANK: European advanced exoskeleton for rehabilitation of Acquired Brain Damage (ABD) and/or spinal cord injury's patients
- Neurophysiological approach to evaluate cerebro-cerebellar interactions. Characterization of a cerebellar connectivity EEG index
- SYMBITRON-Symbiotic man-machine interactions in wearable exoskeletons to enhance mobility for paraplegics

### **Social Neuroscience Lab**

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- And yet they MOve: immobile patients re-enter the physical world through embodiment in avatar or robot surrogates
- Anosognosia for bucco-facial and limb apraxia
- Autistic traits influence interpersonal motor coordination in a joint-action task
- Come together: Human -avatar on - line interactions boost joint-action performance in apraxic patients
- Sensorimotor illusions and representation of the body in healthy people with spinal cord incurie
- The role of sensory feedback in the control of external devices via braincomputer interfaces

### **Spinal Cord Injury Rehabilitation (SPIRE)**

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- Antibodies against Nogo-A to enhance regeneration and functional recovery after acute spinal cord injury, a multicenter European clinical proof of concept trial-NISCI
- EMSCI European Multicenter Study about Spinal Cord Injury
- SCI-ARMI Spinal Cord Injury - Ability Realization Measurement Index

## **RESEARCH LINE F Functional Neuroimaging**

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### **Functional Neuroimaging Lab**

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- Analisi dei correlati strutturali e funzionali in pazienti con ADHD e definizione del profilo clinico e neuropsicologico
- Le basi neurali dell'effetto boost attenzionale
- Indagine delle caratteristiche neuroanatomiche, cognitive e comportamentali della sindrome di Ehlers-Danlos, tipo ipermobile [JHS/EDS-HT]: implicazioni per la diagnosi e il trattamento
- Morphofunctional visual pathways evaluation in multiple sclerosis: possible identification of neurodegenerative biomarkers
- MRI examinations in patients with pacemaker or ICD: a personalized tool for the risk assessment
- Neurobiological bases of social cognition deficits observed in patients with myotonic dystrophy type 1 and type 2
- The cerebellar role in Alzheimer disease
- Tra riserva celebrale e riserva neurale. Ruolo dei marcatori di neuroimmagine nell'individuare modelli dinamici di resilienza cognitiva e celebrale