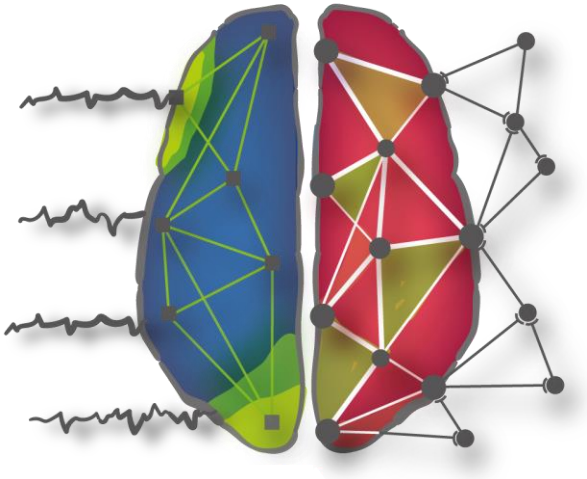
I-C3N

2025



INTERNATIONAL CONFERENCE ON NEUROPHYSIOLOGY, NEUROPSYCHOLOGY AND NEUROTECHNOLOGICAL ADVANCES

SCIENTIFIC PROGRAM

Friday, 20th June

16:00 Opening, by Fernando Maestú

16:20 Oral Communications: Successful aging

16:50 Oral Communications: Pathological aging

17:20 Coffee Break

17:45 Oral Communications: Neurodevelopment and addictive behaviours

18:20 Coffee Break

18:40 Oral Communications: Memory and cognition

19:00 Oral Communications: Data analysis

Saturday, 21st June

Oral Communications: Computational neuroscience 11:00

Oral Communications: Applied clinical neuroscience 11:25

Poster session 11:40

Talk, by Patrique Fiedler 12:30

Talk, by Christoffer Hatlestad-Hall 13:00

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ABSTRACT BOOKLET

Friday, 20th June

Opening

16:00 Fernando Maestú. Multilevel analysis of the E/I imbalance in AD: a proposal

Successful aging

16:20 Opening, by María Eugenia López

16:25 Noemí López & Blanca P. Carvajal. A Multifactorial Model of Successful Cognitive Aging: Collecting the Determinants of Cognitive Health in the Oldest Old

16:40 Luisa Zapata. Normative lifespan models for detecting cognitive deviations using low-density EEG

Pathological aging

16:50 Opening, by Federico Ramírez

16:55 María Sevilla. Preliminary Study on the Efficacy of a Combined Cognitive and Neuromodulation Intervention in Relatives of Alzheimer's Patients: A power spectrum analysis

17:05 Lucía H Orozco & Ignacio Taguas. Cognitive Connectome in the Alzheimer's disease continuum

Neurodevelopment and addictive behaviours

17:45 Opening, by Luis Antón

17:50 Marcos Uceta. Behavioral analysis of Alzheimer's disease animal model after heavy alcohol consumption: a preliminar study

18:00 Alberto del Cerro. Early markers of alcohol risk in adolescence

18:10 Danylyna Shpakivska. Inhibition and impulsivity in adolescence: are they modulated by transient beta bursts?

Memory and cognition

18:40 Opening, by Javier Pacios

18:45 Aimée Reyes. Revealing the causal role of the right lateral prefrontal cortex in active forgetting

Data analysis

19:00 Opening, by Ricardo Bruña

19:05 Adelia Martínez. MEGIFY Project: Determination of methods for obtaining high quality EEG recordings, comparable to MEG, for low cost and high accuracy diagnosis

19:15 Paula Díaz. Artifact Characterization for Real-Time EEG Filtering in FES Rehabilitation of Spinal Cord Injury Patients

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Abstract Booklet

Saturday, 21st June

Computational neuroscience

11:00 Opening, by Gianluca Susi

11:05 Anna Freund. Developing a Neural-Astrocyte Mass Model including Parameter Inference using MEG data from Healthy and Cognitive Impaired Subjects

11:15 Pablo Vizcaíno. A (somewhat) comprehensive exploration of a model of a microcortical column and its response to stimulus

Applied clinical neuroscience

11:25 Opening, by Pablo Cuesta

11:30 Adrián Quivira. FOOOF algorithm implementation – Tips and Warnings

Poster session (11:40 – 12:30)

Almudena Trucharte. Investigating Models of Ideological and Delusional Belief Systems

Brenda Chino. Electrophysiological Signatures of Social network index: Preliminary results

Diana Zahn. Magnetic Microspheres: A Toolbox for Hyperthermia, Drug Delivery and Immunomagnetic

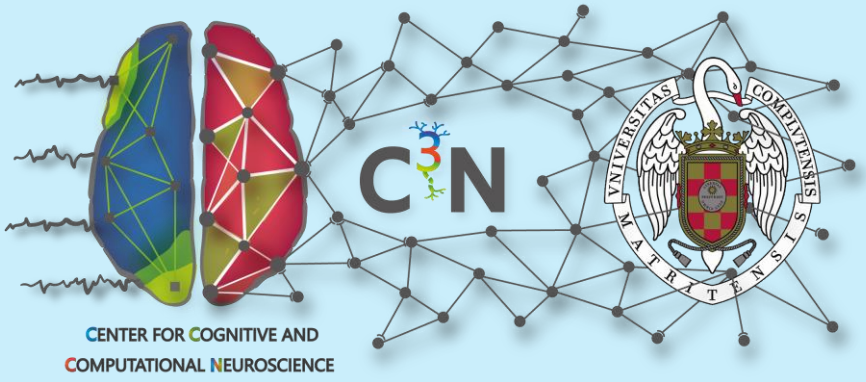
Isabel Suárez. Association between Global Amyloid Burden and Brain Functional Hyperconnectivity in Aging and Cognitive Impairment

Jesús Cabrera. The fluctuations of alpha power: bimodalities, connectivity, and neural mass models

Talks by our Keynote Speakers

12:30 Patrique Fiedler. Progress in mobile and ubiquitous EEG monitoring

13:00 Christoffer Hatlestad-Hall. Is it time to rethink cognition in dementia research?



Multilevel analysis of the E/I imbalance in AD: a proposal

Fernando Maestú

Alzheimer's disease (AD) involves beta-amyloid plaque accumulation and Tau protein phosphorylation, disrupting the brain's excitation/inhibition balance and leading to hyperexcitability and hypersynchrony in alpha and beta bands—factors linked to cognitive decline. This project hypothesizes that transcranial alternating current stimulation (tACS) can desynchronize these pathological brain states, restoring network function and improving cognition.

The goal is to develop and test a personalized tACS protocol for patients with AD and mild cognitive impairment (MCI). Computational models will be built using over 700 magnetoencephalography (MEG) recordings, refined with brain organoids derived from human induced pluripotent stem cells (hiPSCs), and individualized with diffusion-weighted MRI (dw-MRI) data to capture axonal density and conduction velocity. These models will simulate hypersynchrony and guide tACS parameter optimization to rebalance functional connectivity.

tACS efficacy will be evaluated in two groups: first-degree relatives of AD patients and individuals with amnestic MCI. Cognitive performance will be monitored during the intervention and over a 3-year follow-up. By combining data-driven modeling, human organoids, and neuroimaging, this project offers an innovative, non-invasive, and cost-effective approach that could delay cognitive decline in at-risk individuals and improve current intervention strategies.

A Multifactorial Model of Successful Cognitive Aging: Collecting the Determinants of Cognitive Health in the Oldest Old

Noemí López & Blanca P. Carvajal

Carvajal, Blanca P.[1,2*]; López-Núñez, Noemí[1,2*]; Orozco, Lucía H.[1,2]; Taguas, Ignacio[1,3]; López-García, María Eugenia[1,2]

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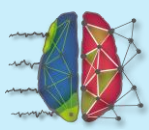
Population aging presents a global challenge: while life expectancy increases, it is not always accompanied by good cognitive and brain health. Understanding the risk and protective factors that shape successful cognitive aging is essential. Our study focuses on individuals aged 80 and above—a population rarely addressed in aging research—with the aim of developing a multifactorial model of aging. We are currently in the recruitment phase. Inclusion criteria include age ≥80, maximum mild cognitive impairment (MCI), Geriatric Depression Scale 15 (GDS-15) <10, no severe psychiatric conditions, and not being institutionalized. Participants are recruited via geriatric consultations, informational flyers, peer recommendations, and prior study cohorts. To enhance accessibility, part of the protocol can be completed at home. The full protocol includes four 2-hour sessions: (1) neuropsychological assessment, (2) completion of lifestyle questionnaires and functional measurements, (3) blood extraction for biochemical and genetic analysis, (4) electroencephalography (EEG) and magnetic resonance imaging (MRI), (5) qualitative interview on the ageing process, and (6) an annual follow-up.

Keywords: Successful cognitive ageing, MCI, EEG, oldest-old



Normative lifespan models for detecting cognitive deviations using low-density EEG

Luisa María Zapata Saldarriaga

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The global rise in neurodegenerative disorders has created a growing demand for scalable, non-invasive tools capable of monitoring brain function across the lifespan. Electroencephalography is a well-established method with high temporal resolution and low operational cost, making it particularly suitable for population-level applications. In this study, we investigated whether low-density portable EEG systems could be used to construct normative models in a multicenter context. Results demonstrated strong consistency in the theta band, where spectral power differences were observed both at the group level and through individual deviations from age-expected norms. These findings suggest that even with a reduced electrode configuration, portable EEG systems can capture relevant neurophysiological markers suitable for individualized evaluation. The observed deviation percentages from normative EEG models may provide added value for clinical assessment at the individual patient level.

Keywords: Electroencephalography, Normative Model, Aging, Theta band, Neurodegenerative disorders

Preliminary Study on the Efficacy of a Combined Cognitive and Neuromodulation Intervention in Relatives of Alzheimer's Patients: A power spectrum analysis

María Sevilla García

Sevilla-García, María[1,2]; Taguas, Ignacio[2,3]; Orozco, Lucia H.[2,4]; López-Núñez, Noemí[2,4]; Ramírez-Toraño, Federico[2,4]; Bruña, Ricardo[2,5]; López-Higes, Ramón[4]; Delgado-Losada Marisa[4]; Gómez-Ariza, Carlos[6]; Maestú, Fernando[2,4,7].

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This study examines the effects of transcranial alternating current stimulation (tACS) combined with cognitive training (CT) on neural activity and cognitive performance. A total of 136 participants were assigned to three groups: two comprised of first-degree relatives of individuals with Alzheimer's disease — Verum (n = 43) and Sham (n = 40) — and one with nonrelatives — Control (n = 53). The study included three phases for the relatives groups: pre-intervention assessment (neuropsychological testing, EEG, MRI, and blood samples), a 10-week intervention (weekly tACS+CT sessions), and post-intervention evaluation. For the control group, only the pre- and post-intervention phases were carried out. The tACS protocol delivered 3 mA peak-to-peak current to frontal areas, focusing on the Anterior Cingulate Cortex (ACC). We hypothesized that tACS would reduce hypersynchronization between the ACC and parieto-occipital regions, enhancing CT effects and improving cognitive and network organization. Preliminary findings indicate modulation of brain activity in targeted regions; further analyses are underway to determine behavioural and functional network outcomes.

Keywords: AD, tACS, EEG, AD, Relatives

Cognitive Connectome in the Alzheimer's disease continuum

Lucía H Orozco & Ignacio Taguas

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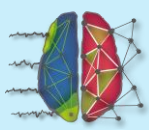
Current knowledge of Alzheimer's disease (AD) has neglected cognitive assessment as an early diagnostic tool, relying instead on biological markers alone. However, multiple biomarkers by themselves are insufficient for diagnosis, since only a percentage of the population that presents them ends up developing AD dementia. Therefore, finding ways to efficiently assess cognitive risk in preclinical populations should be crucial for early intervention. A population of 135 cognitively unimpaired individuals, with ages ranging from 50 to 75, including first degree-relatives of AD characterized by several typical AD biomarkers (ptau-231, NfL, white-matter hyperintensities) and APOE4 presence. Instead of taking a classical approach, where individual cognitive scores are compared between groups, here we use graph theory to capture differences in the cognitive networks as a whole, highlighting the interactions between different cognitive tests. Cognitive networks of individuals with higher biological risk display greater cognitive dedifferentiation, with a central role of executive functioning.

Keywords: Alzheimer´s disease, neuropsychology, graph theory, blood-based biomarkers



Behavioral analysis of Alzheimer's disease animal model after heavy alcohol consumption: a preliminar study

Marcos Uceta

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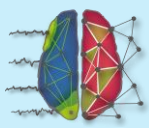
Although the cognitive study of Alzheimer's disease (AD) traditionally focuses on episodic memory loss and memory consolidation, recent research highlights emotional components during prodromal stages. Anxiety, psychosis, and depression are more prevalent in patients with mild cognitive impairment, preceding severe memory loss. Additionally, lifestyle plays a crucial role in the early onset of the disease, particularly all the stressors that elevate neurotoxicity and neuroinflammation. Among these, alcohol stands out as a socially accepted factor, often consumed from adolescence, when the nervous system is especially vulnerable to neurotoxic effects due to heightened neuroplasticity. This study hypothesises that emotional and regulatory prodromal symptoms of AD will manifest earlier and more severely in animals exposed to intensive alcohol intake during adolescence, assessed through anxiety-like and depression-like behaviours in various tests.

Keywords: Alzheimer´s disease, neuropsychology, graph theory, blood-based biomarkers



Early markers of alcohol risk in adolescence

Alberto del Cerro-León

del Cerro-León, Alberto[1,2]; Uceta, Marcos[1,3]; Shpakivska-Bilan, Danylyna[1,2]; Suárez-Méndez, Isabel[1,2]; Peribáñez-Baz, Héctor[1,2]; Cuesta, Pablo[1,4,5]; Bruña, Ricardo[1,5]; García-Moreno, Luis M.[6]; Maestú, Fernando[1,2,4]; Antón-Toro, Luis Fernando[1,2]

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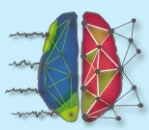
This longitudinal study aimed to identify early neurophysiological markers that could predict the onset and progression of alcohol use during adolescence. A total of 55 adolescents were assessed at two time points, two years apart, using brain electrophysiology-based measures such as oscillatory power and functional connectivity, as well as structural measures derived from magnetic resonance imaging. The results revealed alterations in brain power and connectivity prior to alcohol use, suggesting that these indicators may serve as predictive markers of alcohol consumption. The study offers an innovative perspective on the early detection of neurobiological vulnerabilities associated with substance use in young populations.

Keywords: Adolescence, alcohol, MEG, neurodevelopment, electrophysiology



Inhibition and impulsivity in adolescence: are they modulated by transient beta bursts?

Danylyna Shpakivska Bilan

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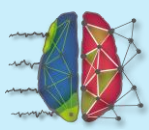
The ability to inhibit an already initiated motor response is fundamental to organized behavior. A deficit in this ability (impulsivity) is a common feature in many psychiatric disorders. M/EEG studies using response inhibition tasks have shown increased beta power in prefrontal and parietal cortices during suppression of unwanted actions. However, trial-by-trial analyses suggest this activity emerges from brief, high-power transient beta bursts rather than sustained oscillations.

To explore this, we recorded magnetoencephalography (MEG) from N = 74 healthy adolescents performing a 70:30 Go/No-Go task. We also assessed their self-reported impulsivity using the Barratt Impulsiveness Scale (BIS-11) and the Sensation Seeking Scale (SSS-V).

We propose that the expression of transient beta bursts could be the underlying neural mechanism explaining both successful inhibitory control and individual differences in impulsivity during adolescence.

Keywords: Responde inhibition, impulsivity, beta bursts



Revealing the causal role of the right lateral prefrontal cortex in active forgetting

Aimée Reyes Vargas

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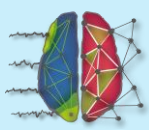
Forgetting is often viewed as a cognitive failure, but recent findings highlight its adaptive value in managing interfering or unwanted memories, crucial for mental health. The Think/No-Think (TNT) task is central to studying active forgetting, particularly suppression-induced forgetting (SIF), which impairs recall of suppressed memories and is linked to emotional resilience. SIF likely depends on inhibitory control involving the right lateral prefrontal cortex (LPFC), which may modulate hippocampal activity. However, neuroimaging offers only correlational support. This project uses transcranial direct current stimulation (tDCS) to test the causal role of the right LPFC in retrieval suppression. Experiment 1 assesses right LPFC involvement using tDCS during the TNT task. Experiment 2 tests lateralization by comparing right and left LPFC stimulation. Experiment 3 explores LPFC connectivity with temporal regions using resting-state EEG. This work combines tDCS and EEG to advance understanding of active forgetting, its neural mechanisms, and its relevance to cognitive control and mental health.

Keywords: Forgetting, Cognitive control, Memory, EEG, tDCS



MEGIFY Project: Determination of methods for obtaining high quality EEG recordings, comparable to MEG, for low cost and high accuracy diagnosis

Adelia-Solás Martínez-Évora

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The MEGIFY project aims to develop a protocol that optimizes the acquisition and processing of Electroencephalography (EEG) data to be comparable with Magnetoencephalography (MEG) data. To this end, a high-quality database of simultaneous EEG and MEG recordings together with detailed anatomical images will be acquired. We will assess the minimum amount of information required to obtain an accurate estimate of brain activity as well as the potential of machine learning to estimate key parameters of head modelling. In addition, we will assess the differences between brain activity estimated from EEG and MEG in different cognitive states. The study will contribute to improving the accuracy of EEG models, facilitating their application in research and clinical settings. The combination of advanced neuroimaging techniques with artificial intelligence will overcome some of their current limitations, optimising their use for the analysis of brain activity.

Keywords: Magnetoencephalography, Electroencephalography, Machine Learning

Artifact Characterization for Real-Time EEG Filtering in FES Rehabilitation of Spinal Cord Injury Patients

Paula Díaz Marquiegui

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An incomplete spinal cord injury spares some neural pathways, enabling synaptic reinforcement and axonal sprouting around the injury site. Repeatedly activating muscles triggers action potentials from the motor cortex through spinal grey matter to muscle fibers, strengthening synapses in the damaged region. In parallel, functional electrical stimulation (FES) delivers artificial sensory signals that ascend from muscle to cortex, converging with motor signals at the injury site and boosting Hebbian plasticity. To synchronize FES with cortical commands detected by electroencephalography (EEG), we characterized muscle and movement artifacts for real-time filtering. Applying continuous wavelet transforms on EEG recordings during sit-stand movements revealed that muscle artifacts exhibited high-frequency (>20 Hz) oscillations, especially over occipital sites, while movement artifacts appeared as spatially distributed broadband bursts of brief, high-amplitude peaks. Notably, wavelet analysis distinguished artifacts more clearly than power-spectrum methods. In future work, we plan to implement real-time wavelet processing for artifact detection and removal.

Keywords: FES, EEG, rehabilitation, artifact detection, SCI

Developing a Neural-Astrocyte Mass Model including Parameter Inference using MEG data from Healthy and Cognitive Impaired Subjects

Anna Freund

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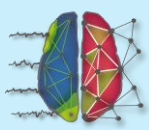
Neural mass models (NMM) can simulate brain signals by modelling the average activity of excitatory and inhibitory neural populations within a cortical column. Advances in astrocyte research demonstrates their ability to modulate firing synchrony, shift excitation/inhibition balance and regulate synaptic plasticity, essential functions for brain computations. Incorporating astrocytes in a NMM results in a neural-astrocyte mass model (NAMM), describing the interplay between astrocytic calcium dynamics and neural signaling. The implemented NAMM demonstrates how astrocytic coverage of synapses, neuron-astrocyte communication, and astrocytic calcium transients change properties of the neural firing. Moreover, parameter estimation with simulation-based inference (SBI) on mild cognitive impaired and healthy subjects, suggests that model parameters could function as biomarkers for Alzheimer's disease.

Keywords: Astrocyte, calcium dynamics, NMM, Alzheimer, SBI



A (somewhat) comprehensive exploration of a model of a microcortical column and its response to stimulus

Pablo Vizcaíno García

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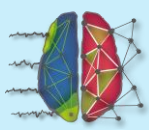
5. Institute for Advanced Studies in Basic Sciences

The characterization of a biologically realistic model of a cortical column is paramount for in-silico brain models. The brain cortex is structurally organized in columnar structures, with neuronal populations divided into 6 different layers, interconnected amongst each other and that receive constant stimulus from external sources, like the thalamus. This work explores the dynamics of a model of a cortical column. The original designers of the column model, Potjans and Diesmann, represented this functional cortical module with 77,000 neurons and 0.3 billion synapses. Each neuron is modeled as a point-like unit governed by an ordinary differential equation (ODE). The column has been implemented using the software NEST, and an exhaustive exploration of parameter space has been done, observing its synchronization, irregularity and, most importantly, frequency dynamics as we modify different biophysical parameters. Additionally, we investigate the response to an external stimulation.

Keywords: Computational Modelling, Alpha rhythm, gamma rhythm, Working memory



FOOOF algorithm implementation – Tips and Warnings

Adrián Quivira Lopesino

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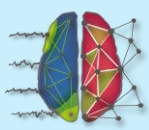
In 2020, UCSD researchers developed the FOOOF (*Fitting Oscillations & One-Over-F*) toolbox to characterize the aperiodic exponent of spectral power from magnetoencephalography (MEG) and electroencephalography (EEG) data. Proper FOOOF parameter selection is crucial, including peak width, maximum number of peaks, minimum peak height, peak threshold, frequency range, and the algorithm's model. We investigated how these parameters impact the 1/f algorithm fitting using a database of healthy controls, individuals with mild cognitive impairment (MCI), and Alzheimer's disease (AD) patients. Our results demonstrate that the outcome vary significantly depending on the FOOOF parameters applied. This highlights the critical need for careful parameter tuning to ensure accurate and reliable aperiodic activity assessment.

Keywords: MEG, FOOOF, Aperiodic activity, MCI



Investigating Models of Ideological and Delusional Belief Systems

Almudena Trucharte

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IN-MIND is a pioneering project that tackles the challenge of distinguishing delusions from strongly held beliefs, such as religious and political ideologies, which, while non-pathological, can be socially disruptive. This distinction is complex due to overlapping features across belief systems. IN-MIND will systematically compare delusions with ideological beliefs using dimensions traditionally used to define delusions. A large, representative UK sample will be assessed online using validated psychometric tools and network analysis. The study will explore how belief transmissibility, social identity, and belief alignment distinguish delusions, typically non-shared, from widely propagated ideological beliefs. By comparing individuals with strong or weak ideological commitments to a clinical sample with delusions, IN-MIND aims to clarify belief structures and their transmission.

Keywords: Belief systems; delusions, network, political and religious ideologies

Electrophysiological Signatures of Social network index: Preliminary results.

Brenda Chino

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This study aims to analyze the relationship between the social network index and resting-state electrophysiological activity in 26 cognitively unimpaired younger adults. All participants fulfilled the Social Network Index (SNI) using the Cohen's Social Network Index, the UCLA Loneliness Scale and took part in a 5-minute eyes-closed resting-state EEG.The results suggests that participants with a higher activation of high beta have a lower volume of social relationships and a lower perception of loneliness. In addition, participants with a medium social network have higher high beta activation TPOareas than those participants with a diverse social network. The results seem to show a relevant role of high beta in people's sociability and their perception of loneliness that should be further explored in order to understand this relationship more specifically.

Keywords: Social network, loneliness, cognitive performance, EEG

Magnetic Microspheres: A Toolbox for Hyperthermia, Drug Delivery and Immunomagnetic Separation

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Polymeric magnetic microspheres (MMS) can be used for applications including drug delivery, hyperthermia or im-munomagnetic separation. The MMS need to match specific requirements regarding size, magnetic properties and anti-gen binding capacity. We are developing size-controlled PLGA and PLA-MS with oleic acid coated magnetic nanoparti-cles (OA-MNP) and surface-conjugated antibodies. Microspheres were produced by an emulsion-evaporation method. Synthesis parameters were varied to study the tuna-bility of MS size. For incorporating hydrophobic MNP into the MMS, we established an oleic acid coating. The MS size depends mainly on homogenization speed and PVA concentration. MMS can be heated to 43 °C in 100 to 540 sec, depending on MNP content. Drug release showed a burst type kinetic for 37 and 43 °C. Antibodies were im-mobilized on PLA microspheres.We developed MMS that can be adapted by tuning size, incorporating magnetic nanoparticles, and conjugating antibod-ies to their surface.

Keywords: Magnetic nanoparticles, Magnetic microspheres, Drug delivery, Hyperthermia

Association between Global Amyloid Burden and Brain Functional Hyperconnectivity in Aging and Cognitive Impairment

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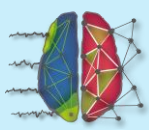
Ongoing developments in Alzheimer's disease (AD) therapeutics underscore the need to elucidate how amyloid-β pathology influences brain function in the early stages of the disease. In this study, we examined the relationship between global amyloid burden and functional connectivity (FC), using data from the Human Connectome Project's Connectomics of Brain Aging and Dementia (HCP-CoBrA) dataset (Cohen et al., 2024; https://doi.org/10.25493/9M27-AW3). 165 participants, 89 cognitively healthy and 76 with cognitive impairment, underwent comprehensive clinical evaluations, magnetoencephalography, and amyloid PET imaging. Using cluster-based permutation testing, we identified significant posterior-parietal clusters with consistent positive correlations between FC strength and the global standardized uptake value ratio (SUVR) in the δ, θ, β, and γ bands. These correlations persisted within groups. Seed-based analyses further identified FC correlations with the global SUVR. Our findings suggest a robust association between amyloid burden and functional hyperconnectivity patterns, highlighting potential early network alterations linked to amyloid pathology.

Keywords: Alzheimer, MEG, amyloid PET



The fluctuations of alpha power: bimodalities, connectivity, and neural mass models

Jesús Cabrera-Álvarez

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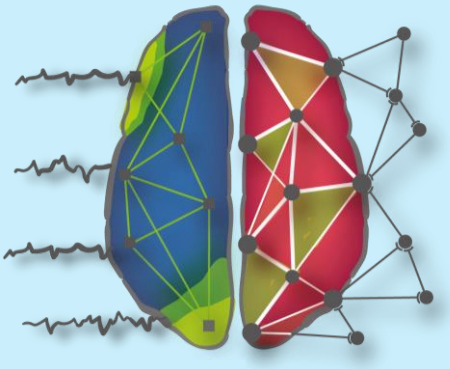
Alpha rhythm is a hallmark of resting-state brain activity and a key biomarker in health and disease. While typically assessed through averaged power spectra, alpha power fluctuates dynamically over time. Using MEG and MRI data from 42 participants at rest (eyes closed/open), we examined the temporal distributions of alpha power and their relationship with default mode network (DMN) connectivity. Alpha power distributions were mostly unimodal exponential, with occasional bimodalities in posterior regions. Connectivity analyses using phase-based (ciPLV) and amplitude-based (cAEC) metrics revealed positive correlations with alpha power in alpha and beta bands, but negative correlations with ciPLV in the theta band. Simulations using Jansen-Rit neural mass models informed by diffusion MRI suggested that post-supercritical fixed point regimes best replicated empirical alpha fluctuations. These findings highlight the dynamic nature of alpha rhythm and its link to FC, offering insights for refining biologically grounded brain simulations.

Keywords: Alpha rhythm, MEG, Resting state, Jansen-Rit, Computational model



Progress in mobile and ubiquitous EEG monitoring

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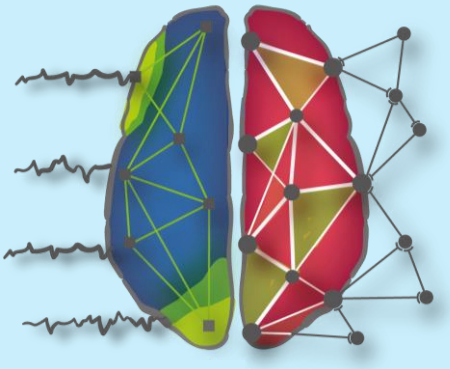
Mobile monitoring of physiological parameters, especially electrophysiological data, is widely used for medical applications, sport sciences, social sciences and continuous self-monitoring. In recent years, the mobile monitoring of brain activity using multichannel electroencephalography has gained momentum. In this talk we will discuss technological and methodological requirements and considerations for mobile EEG, highlighting selected recent developments in sensors, electronics and signal processing techniques. We will investigate the interaction of these components to ensure or enhance signal quality for subsequent analysis and comparison to reference data recorded under stationary laboratory conditions. We will critically review the state of the art regarding possible application areas, existing limitations and eventual future directions for further improvement.

Keywords: Mobile EEG, Dry Electrodes, Signal quality, Signale enhancement



Is it time to rethink cognition in dementia research?

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For a time, dementia research faced challenges, particularly regarding treatment progress. However, recent excitement around new therapeutic possibilities, like monoclonal antibodies for amyloid, has sparked a new wave of innovation. We are now seeing incredibly fast development of new diagnostic tools using CSF and plasma biomarkers. At the same time, artificial intelligence is revolutionising how we analyse complex brain imaging data. Yet, when it comes to assessing the functional impact of dementia – cognition – our methods have not changed much in nearly 70 years. This talk will explore whether our traditional ways of understanding and measuring cognition are ready for innovation, especially when biological and imaging techniques are advancing so quickly. Are we ready to rethink cognition in dementia research?

Keywords: Mobile EEG, Dry Electrodes, Signal quality, Signale enhancement

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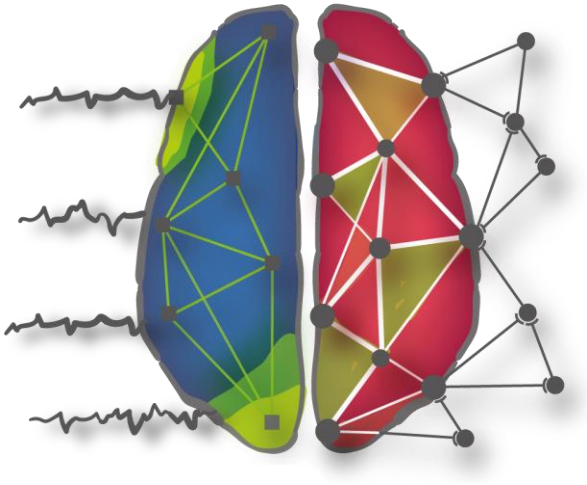

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