PERSONAL INFORMATION

Professional CV of Prof. Claudio Babiloni

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OVERVIEW OF THIS CV

EDUCATION	Ph.D. in Biomedical Sciences (Aalborg University, Denmark) and master's degree in Clinical Psychology (Sapienza University of Rome, Italy)
PRESENT JOB POSITION	Associate Professor of Physiology (Sapienza University of Rome, Italy)
TOTAL ITALIAN ACADEMIC LECTURING CREDITS FROM 2010-2011 TO 2019-2020 (CFU)	127
GRANTS RECEIVED AS PRINCIPAL INVESTIGATOR OF RESEARCH UNIT BY NATIONAL AND INTERNATIONAL SPONSORS FOR RESEARCH	- 23 projects granted by Italian Sponsors for research for a total financing of 1,152,187 (one million-152,187) Euro - 6 projects granted by International Sponsors for research for a total financing of 1,411,448 (one million-411,449) Euro Total financing: 2,550,635 (two million-563,635) Euro
SCIENTIFIC PUBLICATIONS IN PUBMED (JULY 2021): > 300	
H index (July 2021)	Scopus 65
INVITED TALK AND CHAIRMANSHIP AT ITALIAN AND INTERNATIONAL SCIENTIFIC CONGRESSES	68 126
OFFICIAL MEMBER OF EDITORIAL BOARDS OF INTERNATIONAL NEUROSCIENCE JOURNALS	2013-2016 NeuroImage (Impact Factor 2019 of 5.902; Journal Citation Reports) 2011-2017 Clinical Neurophysiology (Impact Factor 2019 of 3.215; Journal Citation Reports) 2012-today Journal of Alzheimer's Disease (Impact Factor 2019 of 3.909; Journal Citation Reports) 2016-today Current Alzheimer Research (Impact Factor 2019 of 3.047; Journal Citation Reports)

MAIN INTERNATIONAL HONORS

- 2 International Awards for Science
- Position of Communications Chair (2017-2019), elected Chair (2019-2021), and past Chair (2021-2023) in Electrophysiology Professional Interest Area (E-PIA) of the "Alzheimer's Association International Society to Advance Alzheimer's Research and Treatment (ISTAART) of International Alzheimer's Association https://action.alz.org/personifyebusiness/Membership/ISTAART/PIA/Electrophysiology.aspx
- Leader of International Federation Clinical Neurophysiology (IFCN) Workgroup for writing Guidelines on EEG analysis in Clinical Neurophysiology (2016)
- Senior Co-Chair of the Special Interest Group of interest on "Advanced EEG-MEG techniques in Clinical Neurophysiology", International Federation of Clinical Neurophysiology (2018-present Senior) https://www.ifcn.info/sigs/AETCN/index.asp

ORGANIZATION OF INTERNATIONAL MEETINGS/CONFERENCES AND THIRD MISSION (MAIN)

- Electrophysiology Professional Interest Area (E-PIA) Day Scientific Session (London, 2017; Chicago, 2018, Los Angeles, 2019)
- Workshop on IFCN Guidelines on EEG analysis in Clinical Neurophysiology (Chengdu, China, 2018)
- 3-Day "Rome Training Meeting" of H2020 Marie S. Curie ITN-ETN project "BBDiag" (Rome, 2018; http://bbdiag-itn-etn.eu/)
- 1-Day Summer School on "Amyloid and Alzheimer Disease: EEG windows of brain hyper-excitability in patients?" of H2020 Twinning project "Synanet" (Rome, 2018; https://www.synanet2020.com/)
- Advisory Board of 17th European Congress of Clinical Neurophysiology (ECCN, Warsaw, Poland, 2019)
- Scientific Committee of 5th International Congress of Basic and Clinical Multimodal Imaging (BaCI2021), Naples, Italy, 2021)

SAPIENZA UNIVERSITY OF ROME: THE HOME

Course in Psyhology (1982-1986), Permanent Staff as Technician for Research (1988-2007), and Permanent Staff as Associate Professor in Physiology (2012 to date)
In total, > 30 working years spent in Sapienza University of Rome

WORK EXPERIENCE

December 2012 – to date

Associate Professor of Physiology

Department of Physiology and Pharmacology "V. Erspamer", Sapienza University of Rome

▪ Responsible for neurophysiological research lines and Lecturer in Physiology

December 2007 – December 2012

Associate Professor of Physiology

Department of Biomedical Sciences, University of Foggia (Italy)

▪ Responsible of neurophysiological research lines and Lecturer in Physiology

EDUCATION AND TRAINING

2001 Ph.D. in "Biomedical Sciences and Engineering" at International Doctoral School in Biomedical Sciences and Engineering

University of Aalborg, Aalborg (Denmark)

- Biomedical Sciences and mathematical approaches to EEG studies

1987 Master's degree in Clinical Psychology

Sapienza University of Rome, Italy

- Clinical and cognitive psychology, Statistics for psychological sciences

PERSONAL SKILLS

Mother tongue(s): Italian

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	C1	C1	C1
	First Certificate of Cambridge				

Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2 Proficient user
Common European Framework of Reference for Languages

ADDITIONAL INFORMATION

Awards and Honours

Year **Title**

1996 "Prize of Accademia Medica Romana" (1.500.000 Lire) to develop a scientific research with University of Munich (D).

1998 "Member" of Italian Society of Physiology (SIF).

2001 "Member" of Italian Society of Psychophysiology (SIPF)
2002-2005 "Officer" of the Steering Committee of Italian Society of Psychophysiology (SIPF)
2008-2009 "Revisore dei Conti" of the Steering Committee of Italian Society of Psychophysiology (SIPF).
http://www.sipf.it/Direttivi-Precedenti

2001, 2002, 2003 "Travel award" (500 USA dollars) received by Organization for Human Brain Mapping.

2006 "Prix Lèon et Henri Fredericq (Classes de Sciences)" received by Académie Royale (des sciences, des lettres ex des beaux-arts) de Belgique (Degree Diploma).

2013 "Award of Honour" received by the Scientific Committee of the "Second International Conference on Basic and Applied Physiology" held in SMS Medical College, Jaipur, India, on December 21st and 22nd, 2013.

2016 Leader of International Federation of Clinical Neurophysiology (IFCN) Workgroup for writing the articole entiled "IFCN Guidelines for topographic and frequency analysis of EEG", committed to by the President of IFCN Executive Committee.
https://www.uniroma1.it/it/node/37938,
https://www.sciencedirect.com/science/article/pii/S1388245719311642.

2017-2019 "Communications Chair" of the Electrophysiology Professional Interest Area of the Alzheimer's Association International Society to Advance Alzheimer's Research and Treatment (ISTAART) https://action.alz.org/personifyebusiness/Membership/ISTAART/PIA/Electrophysiology.aspx.

2018 Co-leader of the International Federation of Clinical Neurophysiology (IFCN) Special Interest Group on "Brain functional connectivity in Clinical Neurophysiology", committed to by the IFCN Executive Committee.
http://www.ifcn.info/sigs/sig-functional-brain-connectivity-as-revealed-by-eeg-meg/.

2019 Co-leader of the Workgroup "International Clinical Care Translation using EEG" committed to by the Steering Committee of Global Brain Consortium.

https://globalbrainconsortium.org/.

2019-2021 Elected Chair of Electrophysiology Professional Interest Area of the Alzheimer's Association International Society to Advance Alzheimer's Research and Treatment (ISTAART).

2021-2023 Past Chair of Electrophysiology Professional Interest Area of the Alzheimer's Association International Society to Advance Alzheimer's Research and Treatment (ISTAART), based on the ISTAART Operating Guidelines.
https://action.alz.org/personifyebusiness/Membership/ISTAART/PIA/Electrophysiology.aspx).

2020-today Leader of the Workgroup of the European Chapter of the International Federation of Clinical Neurophysiology (IFCN) for writing the position paper entitled "*Clinical Practice Guideline Protocol: Recommendations for the Biomarker-Based Diagnosis of Dementia. A European Inter-Societal Delphi Consensus*".

2020-today Leader of the Workgroup of the European Chapter of the International Federation of Clinical Neurophysiology (IFCN) for writing the position paper entitled "*Source imaging of scalp EEG signals in presurgical evaluation of patients with drug-resistant focal epilepsy*". Initiative of IFCN and International League Against Epilepsy (ILAE) https://www.ilae.org/.

2020-today member of theWorkgroup of the European Chapter of the International Federation of Clinical Neurophysiology (IFCN) for producing the Shared European Brain Research Agenda (SEBRA) forH2021-2027Europe. Partners:
(1) il Network of European funding for Neuroscience research (NEURON);
(2) lo Joint Programme –Neurodegenerative Disease Research (JPND);
(3) lo Human Brain Project (HBP).

SCIENTIFIC INTERESTS AND MAIN RESEARCH LINES

On the whole, our EEG studies globally aim at understanding neurophysiological oscillatory mechanisms of the cortical neural synchronization underpinning vigilance, consciousness, sensorimotor, and cognitive functions. In this context, the EEG studies in patients with Alzheimer's disease, Parkinson disease, Major Depression, Dementia with Lewy Bodies, multiple sclerosis, chronic renal disorders, and HIV explore (1) the contribution of ascending activating (cholinergic, dopaminergic, serotoninergic, etc.) and thalamocortical-corticothalamic systems on those higher functions and (2) the role of EEG biomarkers in clinical neurophysiological applications.
Our methodological approach is mainly focused on the use of advanced EEG techniques in experiments based on the recording of oscillatory EEG activity in conditions of resting state and during sensorimotor and cognitive demands.
Structural and magnetic resonance imaging is used for correlation studies investigating the structural and functional connectivity at the basis of EEG rhythms, while transcranial magnetic stimulation studies aim at perturbing cortical neural oscillating systems underpinning those rhythms to understand the underlying causal neurophysiological mechanisms.

Keywords	*Brief description*
Neurophysiology of cerebral cortex underpinning vigilance, sensorimotor, and cognitive functions in humans	Our EEG studies globally aimed at understanding neurophysiological mechanisms of cortical neural synchronization of cerebral cortex activity underpinning vigilance, sensorimotor, and cognitive functions in humans. Most of them focused on the spatial and frequency features of oscillatory activity of large cortical neural populations during those physiological conditions in both healthy subjects and patients with motor and cognitive deficits. That oscillatory activity opens and closes thalamocortical and cortico-thalamic neural gates with excitatory or inhibitory effects in the related information processing. The study of that EEG activity in patients with Alzheimer's disease, Parkinson disease, Dementia with Lewy Body, Multiple sclerosis, and HIV **has been primarily carried out with neurophysiological intents. That study aimed at understanding (1) the role of ascending cholinergic and dopaminergic systems, and the structural integrity of the brain, on those neurophysiological mechanisms** and then, the related higher functions. In other words, our studies of Clinical Neurophysiology represented an opportunity to investigate the **functions of those brain functional connection systems in humans with non-invasive techniques by the "mirror" images observed in patients with brain disorders**.
Cortical EEG rhythms and Alzheimer's disease	Our EEG studies in Alzheimers' disease (AD) have been focused on resting state EEG rhythms as markers of cortical arousal in quiet vigilance in normal elderly (Nold), amnesic mild cognitive impairment (ADMCI), and dementia (ADD) subjects. Results showed that cortical sources of delta (<4 Hz) and low-frequency alpha (8-10.5 Hz) rhythms were abnormal in ADD and ADMCI patients compared to Nold subjects. Furthermore, the activity of these sources showed higher abnormality over time in both ADD and ADMCI patients. Moreover, this activity was related to the following markers used for the assessment of ADMCI and ADD patients: global cognitive status as revealed by the mini-mental state evaluation score, immediate memory, genetic factor risks, and structural magnetic resonance imaging of the hippocampus and cerebral cortex. Finally, the activity of these sources showed different abnormalities in ADD patients compared with those with Parkinson's disease and disease with Lewy bodies (DLB). These results led support to a model about the **different effects of cholinerigic and dopaminergic ascending systems on thalamus-cortical neural synchronization mechanisms underpinning quiet vigilance, explaining in part cognitive deficits in those patients.**
Clinical neurophysiology	As a secondary byproduct, our EEG studies in patients with Alzheimer's disease, Parkinson disease, Dementia with Lewy Body, Multiple sclerosis and HIV have been contributing to the development and validation of EEG markers for diagnostic, prognostic or monitoring purposes in patients with the mentioned pathological conditions. **The impact of those studies has generated the condition allowing my election as "Chair" of the Electrophysiology Professional Interest Area (E-PIA) of the international Alzheimer's Association (ISTAART)** https://action.alz.org/personifyebusiness/Membership/ISTAART/PIA/Electrophysiology.aspx
Brain activity and cognition in	Our EEG studies have been focused on brain activity related to cognitive functions in people with weight disorders to test the

subjects with body weight disorders	hypothesis of brain neural inefficiency in the processing of food and body image stimuli in obese and underweight subjects. Results showed some abnormal EEG activity of obese and underweight subjects during attention task using food or body image visual stimuli, thus suggesting that **body weight homeostasis may depend on attention to food and body image information contents**.
Neurophysiology of pain and sensorimotor interactions	Our EEG studies on nociception have been focused on anticipatory alpha (8-12 Hz) rhythms preceding warned pain stimuli at rest and during voluntary movements of the ipsilateral or contralateral hand. Results showed a **gating of anticipatory cortical activity (i.e. desynchronization of alpha rhythms) over primary sensorimotor area** ipsilateral to both pain stimuli and voluntary hand movements when compared to anticipatory cortical activity related to resting condition or the event of ipsilateral pain stimulus associated with contralateral voluntary movement. In addition, the perception of the pain was reduced in the case of simultaneous pain and voluntary movements at the same side.
Neuroplasticity in athletes (sport medicine)	Our EEG studies in elite athletes have been focused on cortical arousal during resting state and cognitive-motor tasks to test the hypothesis of **neural brain efficiency in experts**, as revealed by ample resting state alpha (8-12 Hz) rhythms and selected event-related cortical activity. Results showed that in elite athletes (i.e. karate, fencing, golf, shooters), cortical neural synchronization mechanisms at alpha frequency indice a brain efficiency in controlling the general arousal in several experimental conditions (i.e. voluntary movement, movement observation, focused attention) but not all (i.e. balance, complex sensorimotor and visual information processing). **These results suggest that expert brain follows neurophysiological principles of neural "flexibility" of the activation rather then always that of neural efficiency**.

INTERNATIONAL PROJECTS

1) Call and Sponsor: EUROPEAN COMMISSION 7TH FRAMEWORK PROGRAMME IMI Call topic: IMI_Call_2008_1_11: Neurodegenerative Disorders IMI-1 Joint Undertaking
Grant Agreement: 115009
Title of the project: Prediction of cognitive properties of new drug candidates for neurodegenerative diseases in early clinical development. (PHARMA-COG; www.pharmacog.org)
Project duration: 72 months (2010-2015)
Applicant: Dr Jill Richardson, GlaxoSmithKline (UK)
Prof. Claudio Babiloni is Principal Investigator of a Research Unit of University of Foggia (Italy)
Funding for University of Foggia: € 568,000

2) Call and Sponsor: EUROPEAN COMMISSION 7TH FRAMEWORK PROGRAMME CAPACITIES - RESEARCH INFRASTRUCTURES CALL IDENTIFIER: FP7-INFRASTRUCTURES-2010-2
Grant Agreement: RI-261593
Title of the project: Diagnostic enhancement of confidence by an International distributed environment (proposal acronym: DECIDE; www.eu-decide.eu)
Project duration: 42 months (2010-2013)
Applicant: Dr. Laura Leone, Consortium "Gestione Ampliamento Rete Ricerca" (GARR) of Rome (Italy).
Prof. Claudio Babiloni is Principal Investigator of a Research Unit of University of Foggia (Italy)
Funding for the University of Foggia: € 148,000.

3) Sponsor: MENTISCURA Medical Device (https://www.mentiscura.com/)
Title of the project: MENTISCURA TOOL.
Applicant: Prof. Claudio Babiloni, University of Rome "La Sapienza" (Italy)
Project duration: 48 months (2016-2017)
Prof. Claudio Babiloni is Principal Investigator of a Research Unit of University of Rome "La Sapienza" (Italy)
Funding for the University of Rome "La Sapienza": € 145,200.

4) Sponsor: Altoida Medical Device (AMD; www.altoida.com)
Title of the project: Dementia Early Screening and Disease Progression Tracking in the clinical practice by means of ALTOIDA Augmented Reality MedTech (ALTOIDA AR)
Applicant: Prof. Claudio Babiloni, University of Rome "La Sapienza" (Italy)
Project duration: 36 months (2017-2019)
Prof. Claudio Babiloni is Principal Investigator of a Research Unit of University of Rome "La Sapienza" (Italy)
Funding for the University of Rome "La Sapienza": € 55,000.

5) Call EU Joint Programme – JPND Neurodegenerative Disease Research 2016 call "Working Groups for Harmonization and Alignment in Brain Imaging Methods for Neurodegeneration"
Grant Agreement: FNS 31ND30_171200
Title of the project: Harmonization of acquisition and processing of Brain Imaging Biomarkers for Neurodegenerative Diseases: A strategic Research Agenda for best-practice guidelines (SRA-NED)
Project duration: 9 months (2016-2017)
Applicant: Prof. Giovanni Frisoni, University of Genève (Switzerland).
Prof. Claudio Babiloni is the Working Group Leader of EEG biomarkers (University of Rome "La Sapienza", Italy)
Funding for the University of Rome "La Sapienza": financial reimbursement for the participation to the meetings of the Working Group Leader of EEG biomarkers.

6) **INTERNATIONAL** HORIZON 2020, H2020-MSCA-ITN-2016 (Marie Skłodowska-Curie Innovative Training Networks; MSCA-ITN-ETN)

Grant Agreement: 721281
Title of the project: Blood Biomarker-based Diagnostic Tools for Early-Stage Alzheimer's Disease (BBDiag)
Project duration: 48 months (2017-2020)
Applicant: Prof. Genhua Pan (University of Plymouth, UK).
Prof. Claudio Babiloni is Principal Investigator of a Research Unit of University of Rome "La Sapienza" (Italy) and Scientific Responsible for two early-stage researchers, namely Mrs. Jessica Janson (Germany) and Mrs. Marina Blūma Selivanova (Russia).
Funding for the University of Rome "La Sapienza": € 495,448.64.

ACTIVITIES IN EDITORIAL BOARDS OF SCIENTIFIC JOURNALS

Editorial Board of international scientific journals
Journal of Alzheimer's disease (Associate Editor 2015 and 2019-2030, Senior Editor, 2012-2014, 2016-2018) Impact Factor 2019 of 3.909; Journal Citation Reports
Clinical Neurophysiology (Editorial Board, July 2011-June 2017) Impact Factor 2019 of 3.215; Journal Citation Reports
NeuroImage (Editorial Board, 2013-2016), Impact Factor 2019 of 5.902; Journal Citation Reports
Current Alzheimer Disease (Editorial Board, 2016-2021) Impact Factor 2019 of 3.047; Journal Citation Reports

Reviewer on-demand for International scientific journals
Neurobiology of Aging, International Journal of Psychophysiology, NeuroReport, Journal of Psychophysiology, Psychophysiology, Epilepsia, Cortex, Medical Research Monitor, Brain Research Bulletin, Brain Research, Experimental Brain Research, Journal of Neurophysiology, Journal of Applied Physiology, Brain, Cerebral Cortex, Human Brain Mapping, IEEE Transactions on Neural Systems & Rehabilitation Engineering, IEEE Transactions on Biomedical Engineering. Aging and Clinical Experimental research. Experimental Brain Research, BMC, PNAS, Journal of Neuroscience, Clinical Neurophysiology, Journal of Alzheimer's disease, and Current Alzheimer Disease.

PUBLICATIONS IN PEER-REVIEWED JOURNALS REGISTERED IN MEDLINE http://www.ncbi.nlm.nih.gov/PubMed/ or ISI until 2020

Total papers (1991-2020)	Scopus	338
Total papers (1991-2020)	Pubmed	295
Total Impact factor (1991-2020)	ISI	1,217.8
Mean Impact factor (1991-2020)	ISI	4.1
Total citations (1991-2020)	Scopus	13303
Mean citations (1991-2020)	Scopus	39.4

Total papers last 10 years (2011-2020)	Scopus	145
Total papers last 10 years (2011-2020)	Pubmed	130
Total Impact factor last 10 years (2011-2020)	ISI	597.5
Mean Impact factor last 10 years (2011-2020)	ISI	4.6
Total citations last 10 years (2011-2020)	Scopus	2,990
Mean citations last 10 years (2011-2020)	Scopus	20.62

H index (July 2021) Scopus 65

Rome, August 4th, 2021.

Claudio Babiloni