CURRICULUM VITAE

Prof. Giacomo Koch MD, PhD

Nationality: Italian

Date and place of birth: 03/12/1973, Ancona, Italy

Married, two sons

Tel. +39.06-5150-1181

Mobile +39.328-9043863

Email: g.koch@hsantalucia.it

Mother tounge: Italian

Other languages: English, Spanish

Current Positions

2020-Present	Full Professor of Human Physiology, Department of Neuroscience and Rehabilitation, University of Ferrara, Italy.
2006-Present	Principal Investigator and Head of the Non-invasive Brain Stimulation Laboratory of Santa Lucia Foundation, IRCCS, Rome, Italy.

Previous Positions

2018-2020	Associate Professor of Human Physiology, eCampus University, Novedrate, Italy.
2006-2020	Consultant in Neurology, Stroke Unit, Department of Neuroscience, Policlinico Tor Vergata, Rome, Italy.
2005-2006	Clinical Research Fellow at the Sobell Department of Motor Neuroscience and Movement Disorders, University College of London under the supervision of Prof. John Rothwell, London, UK.
2002	Visiting fellow at the Brain Research Unit, Low Temperature Laboratory, Helsinki University of Technology, Finland, under the supervision of prof. Riitta Hari (Neuro-BIRCH III project).
1998-2003	Training in Neurology at Policlinic Tor Vergata, Rome, Italy.
1995-1998	Clinical training at the Department of Neurology, 'Policlinico Umberto I', University of Rome, Italy.

Academic & Medical Qualifications

03/02/2014	Italian national qualification as Full Professor in Neurology.
31/01/2014	Italian national qualification as Full Professor in Physiology.
14/05/2007	PhD in Neuroscience and Neuropsychology at l'Università degli Studi di Roma Cattolica del Sacro Cuore (Rome, Italy).
27/11/2003	Residency in Neurology awarded *cum laude* by *Università degli Studi di Roma Tor Vergata* (Rome, Italy).
14/07/1998	Degree in Medicine and Surgery awarded *cum laude Università degli Studi di Roma "la Sapienza"* (University of Rome, Italy).

RESEARCH

Giacomo Koch is a neurologist and neuroscientist. The main goals of his research are to understand the mechanisms underlying cortical plasticity and cortical connectivity in the healthy human brain, in order to develop novel therapeutic approaches to promote recovery of neurological functions trough methods of non-invasive brain stimulation.

Prof. Koch has a long-lasting experience in the field of clinical neurophysiology of motor and cognitive functions. His main expertise is in the application of non-invasive brain stimulation techniques such as transcranial magnetic stimulation (TMS) and transcranial direct current stimulation (tDCS), mainly used in combination with structural and functional magnetic resonance imaging (MRI) and with electroencephalography (EEG).

He developed novel methods based on multifocal TMS approached to investigate in real-time the task related activation of parieto-frontal cortical circuits (i.e. Koch et al., J Neurosci, 2006,2007,2008; Picazio et al., Curr Biology 2014,) and to study the mechanisms of cortico-cortical plasticity (Koch et al., J Neurosci, 2013, Veniero et al., J Neurosci, 2013; Casula et al., Neuroimage 2016).

Prof. Koch performed several clinical trials evaluating the therapeutic efficacy of rTMS in neurological disorders. He used rTMS to treat cognitive and motor symptoms in Parkinson's disease (Koch et al., Neurology 2005, 2009, Cerasa et al, Brain 2015) and dystonia (Koch et al., Brain Stimulation 2014). He conducted clinical studies using rTMS to promote recovery of cognitive and motor deficits in patients suffering from ischemic stroke (i.e. Koch et al. Brain, 2008; J Neurosci, 2011; Neurology 2012), developing novel approaches based on the possibility to activate cerebellar-cortical circuits trough rTMS in order to promote recovery in patients with cortical-subcortical stroke (Casula et al., Scientific Reports, 2016, Koch et al. JAMA Neurology 2018).

The main current focus of his research is on the field of Alzheimer's disease (AD) and dementia. In the past years, his group has performed a series of neurophysiological studies using TMS in order to investigate the alteration of cortical synaptic transmission and plasticity in AD. They were among the first to demonstrate that LTP-like cortical plasticity is consistently impaired in AD patients as assessed with intermittent theta burst stimulation (iTBS) rTMS protocol applied over the primary motor cortex (Koch et al., JAD 2012), in analogy with animal models of disrupted hippocampal LTP (Selkoe, 2008). Moreover, we discovered that such a remarkable impairment of LTP-like cortical plasticity is independent from age of disease onset (Di Lorenzo et al., Annals of Neurology 2016). Indeed, the magnitude of LTP impairment appears to be influenced by CSF tau rather than by Aβ levels (Koch et al., JAD 2015) and predicts a more aggressive clinical course (Motta et al. JNNP 2018). Therefore, Prof. Koch identified altered LTP-like cortical plasticity as a central neurophysiological feature of AD. Moreover, Prof. Koch discovered that treatment with dopamine agonist rotigotine restored the altered mechanism of LTP-like cortical plasticity in AD patients (Koch et al., Neuropsychopharmacology 2014), suggesting that dopaminergic therapy may have a clinical impact in AD patients.

The translational approach of his research is now directed at finding novel therapies for AD based on the abovementioned research. Non-invasive brain stimulation methods such as rTMS may in this perspective represent a valid tool to potentiate cortical plasticity and thereby improve cognitive functions. In a recent pilot study, we showed that high-frequency rTMS of the default mode network

(DMN) improves long-term memory in patients with prodromal AD, by modulating the neural activity of the precuneus and its connections with medial parietal and frontal areas (Bonnì et al., 2015; Koch et al., Neuroimage 2018). This study paved the way for novel clinical application of rTMS in patients with mild AD. Prof. Koch is currently investigating the long–term effects of DMN rTMS in patients with mild AD when treated during six months in the context of a phase 2 sham-controlled randomized clinical trial (Koch et al., Brain, 2022).

Moreover, Prof. Koch led a phase IIa placebo-controlled RCT to provide the first clinical evidence that in AD patients therapy with dopaminergic agonists such as Rotigotine, administered since early stages, may slow cognitive decline and preserve functional activities (Koch et al., JAMA NO 2020). The project has been funded by the Alzheimer Drug Discover Foundation (ADDF). In a subsequent ADDF funded phase 2/3 trial Prof. Koch will validate these findings in a multicenter study. The findings of the current project will potentially enlarge the potential spectrum of existing pharmacological therapies in mild AD patients. Moreover, it will add new evidence that drugs able to potentiate dysfunctional neurotransmission could lead to relevant clinical beneficial effects.

Present collaborations: Prof. Friedhelm Hummel, EPFL, Switzerland ; Dr. Binith Cheeran, Oxford, UK, Prof. Miguel Fernandez del Olmo, Madrid, Spain; Prof. Pablo Mir, Seville, Spain; Prof. Alessandro Martorana Rome, Italy; Prof. Salvatore Aglioti, Rome, Italy

Team personell: Sonia Bonnì (PhD), Francesco Di Lorenzo (MD), Elias Casula (PhD), Valentina Pezzopane (PhD student), Francesco Ricci (MD), Matteo Ferraresi (Clinical Neurophysiology technician), Andrea Vinci (Clinical Neurophysiology technician), Silvia Picazio (PhD), Michele Maiella (PhD), Ilaria Borghi (PhD), Martina Assogna (MD), Francesca Candeo (PsyD), Alex Martino Cinnera (PhD), Chiara Picciuca (PsyD), Elena Savastano (Phd Student), Danny Spampinato (PhD).

CLINICAL ACTIVITY

2005-2018: clinical activity as a consultant neurologist at the Unit of Neurovascular Therapy (UTN-Stroke Unit) Tor Vergata Polyclinic. Since then he has developed a profound specialization in the field of emergency neurology, acquiring excellent expertise in diagnostic methods of neurosonology (eco-colordoppler of epiaortic vessels and transcranial ecodoppler) and neuroimaging. He has performed numerous intravenous thrombolysis procedures (> 300) and has actively collaborated in the urgent execution of endovascular procedures for arterial recanalization with mechanical thrombectomy methods in collaboration with the interventional radiologist team of the Tor Vergata Polyclinic. He has also actively contributed to the organization of the stroke network for which the Stroke Unit of the Tor Vergata Polyclinic is a reference Hub. In these years he has carried out an intense and uninterrupted activity of assistance dealing with emergency management in collaboration with the emergency department.

2019-present: Director of the Clinical Trial Center for Neurodegenerative Disorders at Santa Lucia Foundation IRCSS. Dr. Koch coordinates and promotes clinical research in the context of randomized controlled trials. The CTC at SLF has been involved in the past years in >15 trials, some of them were self-initiated and received funds from different agencies and pharma companies.

GRANTS

2008-2010	MR-2008-FSL "Markers of cortico-cerebellar dysfunction associated to cognitive impairment in aging". Italian Ministry of Health (€ 84.000,00). PI.
2008-2010	RF-2008-1281075 "Markers of pathological and neurophysiological dysfunction in progressive supranuclear palsy". (€ 230.769,00). PI.
2010-2013	GR-2009-1591859 "Non-invasive induction of long-term synaptic plasticity in the human cerebellum: a new strategy for the rehabilitation of cerebellar disorders", Italian Ministry of Health (€363.715). PI.
2011-2014	"Cerebellar magnetic stimulation: a potential new approach to treat patients with dystonia", grant from the Jacques and Gloria Gossweiler Foundation, Switzerland (€ 196.800,00). PI.
2012-2015	RF-2010-2311484 "Repetitive TMS modulation of the default mode network to clarify the pathophysiology of Alzheimer's disease and prompt a new therapeutic perspective", Italian Ministry of Health (€ 418.800). Co-PI.
2014-2017	RF-2011- 02349953 "Promoting motor re-learning after stroke by non- invasive cerebellar stimulation: a novel integrated TMS/EEG approach", Italian Ministry of Health (€ 336.029,16). PI.
2014-2017	GR-2011- 02348985 "Neuromodulation strategies to enhance the effects of gait rehabilitation in multiple sclerosis patients with cerebellar ataxia", Italian Ministry of Health (€ 115.400,00). Co-PI.
2014-2017	RF-2013-02358409 "A novel structural and functional MRI-derived index of axonal myelination: application to MS and correlation with neurophysiology". Italian Ministry of Health (€261.648,00). Collaborator UO.
2015-2018	RF-2013-02358679 "The prognostic value of collateral flow in acute ischemic stroke secondary to occlusion of intracranial arteries treated by endovascular therapy." Italian Ministry of Health (€ 425.060,00). Collaborator UO.
2015-2018	GR-2013-02358852 "The neural markers of post-stroke recovery: tracking the early dynamics of cortical reorganization with a novel longitudinal multimodal approach." Italian Ministry of Health (€ 272.508,00). Collaborator UO.
2015-2018	RF-2013-02359074 "Identifying preclinical phenotypic and biological markers of Alzheimer's Disease in healthy elderly at risk subjects." Italian Ministry of Health (€ 382.008,00). Co-PI.
2015-2018	GC-2012464 "Dopaminergic therapy in Alzheimer's disease", Alzheimer's Disease Drug Foundation (ADDF), USA (USD: 250.000). PI.
2017-2018	SPE.95 "Effects of Safinamide therapy on neuroplasticity in patients with Parkinson's Disease", Zambon Italia (€ 20.000,00). PI.
2018-2021	RF-2016-02361478 "Left atrial dysfunction in cryptogenic stroke pathogenesis: a novel integrated investigation assessed by cardiovascular magnetic resonance

combined with haemostatic and endothelial abnormalities. Italian Ministry of Health (€ 430.000,00). Collaborator UO.

2018-2022 SPE.103 "Comparative efficacy study in patients with treatment-resistant Major Depressive Disorder.", (€ 59.736,00). PI.

2019-2020 SPE.107 "Effects of therapy with Palmitoylethanolamide combined with Luteolin in patients with Frontotemporal Dementia: a randomized controlled clinical trial.", Epitech (€ 30.000,00). PI.

2019-2022 SPE.108 "NETS trial: Neuroregeneration enhanced by tDCS in stroke", University Hamburg-Eppendorf (€9.000,00). PI.

2019-2022 A2019523S "Precuneus rTMS: A Novel Therapy for Mild AD Patients", BrightFocus Foundation (USA) (USD: 190.000). PI.

2019-2022 GR-2016-02364718 "Novel tailored network-based RMTS treatments in Alzheimer's disease: an integrated multi-imaging approach.", Centro San Giovanni di Dio-Fatebenefratelli Brescia (€ 185.000,00). Co-PI.

2020-2023 GR-2018-12368336 CUP E84I19004310001 "New treatment perspectives in adolescents with Anorexia Nervosa: the efficacy of noninvasive brain-directed treatment", Ministero della Salute/Bambin Gesù, (€ 137.100,00). Co-PI.

2020-2023 GA-201902-2017958 - AFTD RFP "Dopaminergic Therapy for Frontotemporal Dementia Patients. Alzheimer's Disease Drug Foundation (ADDF), USA (USD: 602.800,00). PI.

2020-2023 GA-201902-2017959 - AFTD RFP "Non-Invasive Brain Stimulation for Gamma Induction and Cognitive Enhancement in FTD (Alzheimer's Disease Drug Foundation (ADDF), USA (USD: 1,959,841). Co-PI.

2021-2023 A0375-2020-36546, "Dosimetry of a new rTMS treatment in 3D cultures of Alzheimer's disease for the identification of therapeutic efficacy markers (Acronym: DTA)", Lazio Innova spa, (€ 60.717,80). PI.

2021-2024 GR-2019-12369640 CUP J89C20001030001, "Cerebellar noninvasive stimulation on food related inhibitory control: a novel intervention in anorexia nervosa.", Ministero della Salute, (€ 288.000,00). Co-PI.

2021-2024 GR-2019-12370435 CUP J89C20001350001, "Palmitoylethanolamide + Luteolin (PeaLut) to treat cognitive and behavioural symptoms in sporadic FTD patients: a 24 weeks placebo controlled randomized clinical trial", Ministero della Salute, (€ 450.000,00). Co-PI.

2021-2025 SPE.120, "Randomized, double-blind, placebo-controlled clinical trial to evaluate the effect and safety of oral semaglutide in subjects with early-stage Alzheimer's disease (EVOKE) - NN95354730 and NN95354725 (EVOKE PLUS)", Novo Nordisk, (€ 389.746,00). PI.

2021-2025 SPE.121, "Patient and investigator-blinded, placebo-controlled study to evaluate the efficacy, safety, and tolerability of Bepranemab (UCB0107) in study participants with prodromal to mild Alzheimer's Disease (AD), followed by an open-label extension (OLE) period.", (€ 194.070,00). PI.

2021-2025 H2020-FETPROACT-2020-2 101017716 “Neurotwin”. (Total budget 4.485.735; UO: EURO 867.500). PI UO.

2021-2024 RF-2019-12370470 Phase III trial of dopaminergic therapy with rotigotine in patients with mild Alzheimer's disease (DOPAD3) (€ 290.000,00). PI.

2022-2025 RC-201904-2018531 “Effects of Dopaminergic Therapy in patients with Alzheimer's Disease” (DOPAD-3), ADDF - Alzheimer’s Drug Discovery Foundation (€ 3.593.200,00). PI.

REGISTERED CLINICAL TRIALS

PI of the following clinical trials:

- Effects of Dopaminergic Therapy in Patients with Alzheimer's Disease (DOPAD). ClinicalTrials.gov Identifier: NCT03250741.
- Cerebellar rTMS to Improve Gait Recovery in stroke. ClinicalTrials.gov Identifier: NCT02349953.
- Repetitive TMS of the Default Mode Network in AD (TMS-AD). ClinicalTrials.gov Identifier: NCT03778151
- Repetitive TMS of the Posterior DMN in AD. ClinicalTrials.gov Identifier: NCT05454540
- Palmitoylethanolamide Combined With Luteoline in Frontotemporal Dementia Patients. A Randomized Controlled Trial (PEA-FTD). ClinicalTrials.gov Identifier: NCT0448901
- Dopaminergic Therapy for Frontotemporal Dementia Patients. ClinicalTrials.gov Identifier: NCT04937452
- Cortico-cortical Stimulation and Robot-assisted Therapy for Upper Limb Recovery After Stroke (CCS&RAT) (CCS&RAT). ClinicalTrials.gov Identifier: NCT05478434
- Effects of Cerebellar tACS-iTBS in Ataxia (EtABeta). ClinicalTrials.gov Identifier: NCT06420271

Participation in the following international clinical trials:

- Neuroregeneration Enhanced by Transcranial Direct Current Stimulation (TDCS) in Stroke (NETS). ClinicalTrials.gov Identifier: NCT00909714.
- Efficacy and Safety Study of DP-b99 in Treating Acute Ischemic Stroke (MACSI). ClinicalTrials.gov Identifier: NCT00893867.
- Insulin Resistance Intervention After Stroke Trial (IRIS). ClinicalTrials.gov Identifier: NCT00091949.

- Comparative Effectiveness Research Trial for Antidepressant Incomplete and Non-responders With TRD (ASCERTAINTRD). ClinicalTrials.gov Identifier: NCT02977299.
- CREAD Study: A Study of Crenezumab Versus Placebo to Evaluate the Efficacy and Safety in Participants With Prodromal to Mild Alzheimer's Disease (AD). ClinicalTrials.gov Identifier: NCT02670083.
- A Study to Test the Efficacy, Safety, and Tolerability of Bepranemab (UCB0107) in Patients With Mild Cognitive Impairment or Mild Alzheimer's Disease (AD). ClinicalTrials.gov Identifier: NCT04867616
- A Randomised Double-blind Placebo-controlled Clinical Trial Investigating the Effect and Safety of Oral Semaglutide in Subjects With Early Alzheimer´s Disease (EVOKE). ClinicalTrials.gov Identifier: NN6535-4730.
- A randomised double-blind placebo-controlled clinical trial investigating the effect and safety of oral semaglutide in subjects with early Alzheimer´s disease (EVOKE plus). ClinicalTrials.gov Identifier: NN6535-4725.
- A Phase 3b/4 Multicenter, Randomized, Double-Blind, Placebo-Controlled, Parallel-Group Study to Verify the Clinical Benefit of Aducanumab (BIIB037) in Participants With Alzheimer's Disease. ClinicalTrials.gov Identifier: 221AD305.
- Efficacy and Safety of GSK4527226 [AL101] in Participants With Early Alzheimer's Disease (PROGRESS-AD). ClinicalTrials.gov Identifier: NCT06079190.
- Gamma-Induction in FrontoTemporal Dementia Trial (GIFTeD). ClinicalTrials.gov Identifier: NCT04425148

PRIZES

2024: United States Of The World - Mediterranean Award 2024 for Science and Research

2013: Best researcher of the year 2013 SIPF (Società italiana di Psicofisiologia-Italian Society of Psychophysiology) (€ 1.000).

2010: Young Investigator Award “Asymmetric inter-hemipheric connections between the human parietal cortices”, 29° International Congress of Clinical Neurophysiology (ICCN), Kobe Japan (€ 500).

2009: First prize “Young reserachers of the Italian Society of Neurology” (Giovani Ricercatori in Neurologia della Società Italiana di Neurologia) (€ 2.000).

SELECTED INVITED LECTURES

2024: “Personalized neurostimulation of the default mode network in Alzheimer’s disease” International Summit on Neurodegenerative Diseases, Lisbon September 19-21 2024.

2023: “Emerging Non Invasive Brain Stimulation treatments for cognitive impairment in the Alzheimer’s disease continuum” Sion Stroke Recovery Conference, Sion, Switzerland, December 10-22, 2023

2021: “Towards a Phase III Trial of Rotigotine in Combination with Cholinesterase Inhibitors in Patients with Alzheimer’s Disease”. 14TH CLINICAL TRIALS ON ALZHEIMER'S DISEASE (CTAD) NOVEMBER 9-12, 2021, Boston, USA

2021: “TMS of the default mode newtork in Alzheimer’s disease – a novel therapeutic approach” BrightFocus Alzheimer’s Fast Track® 2021 on December 1-3, 2021

2018: “Dopaminergic Therapy in Patients with Alzheimer's Disease”. 19H INTERNATIONAL CONFERENCE ON ALZHEIMER’S DRUG DISCOVERY, New York, NY, USA.

2016: “Hebbian plasticity in the parieto-frontal network” 6th International Conference on Transcranial Brain Stimulation Göttingen, Germany

2015: “Multimodal neuromodulation of cortical circuits: from basic neurophysiology to clinical application.” Center for Neuroprosthetics, École polytechnique fédérale de Lausanne (EPFL).

2014: “Multimodal Mapping Of Parieto-Frontal Circuits: From TMS To Neuroimaging.” Society of Biological Psychiatry, 69th Annual Meeting, New York, NY, USA.

2014: “Non-invasive brain stimulation in rehabilitation of neglect”. 8th WORLD CONGRESS for NEUROREHABILITATION, Istanbul, Turkey.

2014: “Cortical plasticity in Alzheimer’s disease patients”. 30th International Congress on Clinical Neurophysiology (ICCN). Berlin, Germany.

2014: “D2 agonist administration restores altered cortical plasticity in Alzheimer’s disease patients”. 13th International Geneva/Springfield Symposium on Advances in Alzheimer’s disease therapy. Geneva, Switzerland.

2013: “Testing cortical connectivity with multifocal TMS”. 5th International Conference on Non-invasive Brain Stimulation. Leipzig, Germany.

2012: “Microscopic damage to the left hemisphere contributes in determining neglect in patients with right hemispheric stroke” European Stroke Conference, Lisbon, Portugal.

2012: “Hyperexcitability of parietal-motor functional connections in the intact left-hemisphere of patients with neglect” XIV International Neuroscience Winter Conference Sölden, Austria.

2011: “Modulation of motor cortical excitability by stimulation of the posterior parietal cortex” International Opening Symposium "Multi-Site Communication in the Brain", Hamburg, Germany.

2011: "Non-invasive stimulation of the human cerebellum: effects on behaviour and neural connectivity" IMN meetings, University College London, UK.

2010: "Functional Modulation of the Primary Motor Cortex: From Animal Models to Clinical Applications". Society for Neuroscience, San Diego, USA.

2010: "Cerebellar magnetic stimulation decreases levodopa-induced dyskinesias in Parkinson disease". Brain stimulation and brain repair International symposium Greifswald, Germany.

2010: "Brain stimulation approaches to neural circuit function". Magstim/University of Oxford TMS Summer School, Oxford, UK.

2010: "Repetitive transcranial magnetic stimulation (rTMS) for the treatment of spasticity". Symposium "Spasticity – Pathophysiology and Treatment" Frankfurt am Main, Germany.

2010: "Neuromodulation and BDNF polymorphisms". 1st Workshop on synaptic plasticity: from bench to bedside, Taormina, Italy.

2010: "Using TMS to study connectivity in the context of human behaviour". Annual Conference of the Society for the Neural Control of Movement, Naples, Florida, USA.

2009: "TMS in rehabilitation of neglect" IX conference of the Italian society of Neuro-rehabilitation, Rome, Italy.

2008. "New methods for studying connectivity form parietal to motor cortex". Third International Conference on TMS and DCS, Goettingen, Germany.

2005: "Time-specific activation of transcallosal projections during selection of movement in humans". Physiological Society, University College London, UK.

EDITORIAL ACTIVITY

Ad Hoc Reviewer for the following journals: Nature Neuroscience, Neurology; Brain; Annals Of Neurology; Stroke; Journal of Neuroscience; Trends in Cognitive Neuroscience; Current Biology; Biological Psychiatry; European Journal of Neurology; European Journal of Neuroscience; Neuropsychologia; Human Brain Mapping; Clinical Neurophysiology; Experimental Brain Research; Journal of Alzheimer's Disease; Neuroimage; Journal of the Neurological Sciences; Journal of Neurology; Journal of Neurology Neurosurgery and Psychiatry; Journal Psychiatry and Neuroscience; Movement Disorders; Multiple Sclerosis; Neurobiology of Aging; Brain Stimulation; Neuropsychology; Neuroscience Letters; Parkinsonism and Related Disorders.

Member of the Editorial Board of the following journals:

- BMC Neurology
- Functional Neurology
- The Scientific World Journal: Neurology

- Journal of Alzheimer's disease
- International Journal of Brain Science
- Brain Topography

MEMBERSHIP OF SCIENTIFIC SOCIETIES

2018-present: Vice President of Italian Society of Psychophysiology and Cognitive Neuroscience (Società Italiana di PsicoFisiologia-SIPF).

2016-present: Member of the executive board of the Italian Society for Dementia (Società Italiana di Neurologia-demenze-SINDEM).

2012-2014: Member of the Scientific Committe of the Italian Society for Dementia (Società Italiana di Neurologia-demenze-SINDEM).

2012-present: Member of the Italian Society of Psychophysiology and Cognitive Neuroscience (Società Italiana di PsicoFisiologia-SIPF).

2009-present: Member of the Italian Society of Clinical Neurofisiology (Società Italiana di Neurofisiologia clinica-SINC).

2006-2016: Member of the Italian Society of Neurology (SIN).

2006-present: Member of the Society for Neuroscience (SfN).

PATENTS

1. *Systems and methods for providing personalized targeted non-invasive stimulation to a brain network*. Patent number: 11998740, Date of Patent: June 4, 2024 Inventors: Giacomo Koch, Emiliano Santarnecchi.

2. *Combination drug formulations including Roigotine and an Acetylcholinesterase inhibitor for the treatment of neurodegenerative diseases.* Publication Number: 20220040148. Publication Date: February 10, 2022. Inventors: Howard Fillit, Giacomo Koch, Alessandro Martorana, Alessio Travaglia.

PUBLICATION LIST

308 original papers in international peer-reviewed indexed journals

Total citations 16348 (Scopus)

Hirsch Index (H index): 67 (Scopus)

1. Martino Cinnera A, Bonanno M, Calabrò RS, Bisirri A, D'Arienzo M, D'Acunto A, Ciancarelli I, Morone G, **Koch G**. Paired associative stimulation to enhance motor outcome in spinal cord injury: a systematic review of first evidence. Expert Rev Med Devices. 2024 May 30:1-12. doi: 10.1080/17434440.2024.2358048. Epub ahead of print. PMID: 38768088.
2. Bernocchi F, Bonomi CG, Assogna M, Moreschini A, Mercuri NB, **Koch G**, Martorana A, Motta C. Astrocytic-derived vascular remodeling factors are independently associated with blood brain barrier permeability in Alzheimer's disease. Neurobiol Aging. 2024 May 14;141:66-73. doi: 10.1016/j.neurobiolaging.2024.05.002. Epub ahead of print. PMID: 38823205.
3. Baroni A, Antonioni A, Fregna G, Lamberti N, Manfredini F, **Koch G**, D'Ausilio A, Straudi S. The Effectiveness of Paired Associative Stimulation on Motor Recovery after Stroke: A Scoping Review. Neurol Int. 2024 May 14;16(3):567-589. doi: 10.3390/neurolint16030043. PMID: 38804482; PMCID: PMC11130975.
4. Antonioni A, Raho EM, Sensi M, Di Lorenzo F, Fadiga L, **Koch G**. A new perspective on positive symptoms: expression of damage or self-defence mechanism of the brain? Neurol Sci. 2024 May;45(5):2347-2351. doi: 10.1007/s10072-024-07395-x. Epub 2024 Feb 14. PMID: 38353846; PMCID: PMC11021333.
5. Casula EP, Pezzopane V, Roncaioli A, Battaglini L, Rumiati R, Rothwell J, Rocchi L, **Koch G**. Real-time cortical dynamics during motor inhibition. Sci Rep. 2024 Apr 3;14(1):7871. doi: 10.1038/s41598-024-57602-0. PMID: 38570543; PMCID: PMC10991402.
6. Antonioni A, Galluccio M, Baroni A, Fregna G, Pozzo T, **Koch G**, Manfredini F, Fadiga L, Malerba P, Straudi S. Event-related desynchronization during action observation is an early predictor of recovery in subcortical stroke: An EEG study. Ann Phys Rehabil Med. 2024 Apr;67(3):101817. doi: 10.1016/j.rehab.2024.101817. Epub 2024 Mar 12. PMID: 38479116.
7. Picazio S, Magnani B, **Koch G**, Oliveri M, Petrosini L. Frontal and cerebellar contributions to pitch and rhythm processing: a TMS study. Brain Struct Funct. 2024 Apr;229(3):789-795. doi: 10.1007/s00429-024-02764-w. Epub 2024 Feb 25. PMID: 38403781.
8. Cordes D, Gerloff C, Heise KF, Hummel FC, Schulz R, Wolf S, Haevernick K, Krüger H, Krause L, Suling A, Wegscheider K, Zapf A, Dressnandt J, Schäpers B, Schrödl C, Hauptmann B, Kirchner A, Brault A, Gutschalk A, Richter C, Nowak DA, Veldema J, **Koch G**, Maiella M, Dohle C, Jettkowski K, Pilz M, Hamzei F, Olischer L, Renner C, Groß M, Jöbges M, Voller B. Efficacy and safety of transcranial direct current stimulation to the ipsilesional motor cortex in subacute stroke (NETS): a multicenter, randomized, double-blind, placebo-controlled trial. The Lancet Regional Health–Europe. volume 38, 2024, 100825, ISSN 2666-7762, https://doi.org/10.1016/j.lanepe.2023.100825.
9. Ricci F, Martorana A, Bonomi CG, Serafini C, Mercuri NB, **Koch G**, Motta C. Effect of Vascular Risk Factors on Blood-Brain Barrier and Cerebrospinal Fluid Biomarkers Along the Alzheimer's Disease Continuum: A Retrospective Observational Study. J Alzheimers Dis. 2024;97(2):599-607. doi: 10.3233/JAD-230792. PMID: 38160356.
10. Emanuele M, D'Ausilio A, **Koch G**, Fadiga L, Tomassini A. Scale-invariant changes in corticospinal excitability reflect multiplexed oscillations in the motor output. J Physiol. 2024 Jan;602(1):205-222. doi: 10.1113/JP284273. Epub 2023 Dec 7. PMID: 38059677.

11. Bruno M, Bonomi CG, Ricci F, Di Donna MG, Mercuri NB, **Koch G**, Martorana A, Motta C. Blood-brain barrier permeability is associated with different neuroinflammatory profiles in Alzheimer's disease. Eur J Neurol. 2024 Jan;31(1):e16095. doi: 10.1111/ene.16095. Epub 2023 Oct 12. PMID: 37823706.
12. Martino Cinnera A, Picerno P, Bisirri A, **Koch G**, Morone G, Vannozzi G. Upper limb assessment with inertial measurement units according to the international classification of functioning in stroke: a systematic review and correlation meta-analysis. Top Stroke Rehabil. 2024 Jan;31(1):66-85. doi: 10.1080/10749357.2023.2197278. Epub 2023 Apr 21. PMID: 37083139.
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