



# Nikolaos Petsas, MD, PhD

## ● WORK EXPERIENCE

 **SANT'ANDREA ONLUS** – ROME, ITALY

**PRINCIPAL INVESTIGATOR** – 02/2020 – CURRENT

Research project "Telerehabilitation for improving mobility, gait performance in patients with Multiple Sclerosis and moderate disability: a monocentric, controlled and randomized study", funded by the Fondazione G.B Baroni grant.

 **IRCSS NEUROMED** – POZZILLI (IS), ITALY

**RESEARCH CONSULTANT AND ASSISTANT** – 01/04/2018 – 31/10/2022

 **COLLE CESARANO - GERESS S.R.L** – TIVOLI, ITALY

**ON CALL MEDICAL SERVICE** – 01/12/2018 – 30/10/2022

 **PRIVATE CONSULTANCY** – ROME

**PROFESSIONAL CONSULTANCY ON RESEARCH PROJECTS** – 2010 – CURRENT

Occasional collaboration and consultancy with different research groups in Italy and United Kingdom on research projects.

 **SAPIENZA - UNIVERSITY OF ROME** – ROME, ITALY

**RESEARCH CONSULTANT AND ASSISTANT** – 15/10/2019 – 14/01/2020

Department of Human Neurosciences

 **SAPIENZA - UNIVERSITY OF ROME** – ROME, ITALY

**RESEARCH FELLOW (ASSEGNISTA DI RICERCA)** – 14/10/2013 – 30/09/2019

Department of Human Neurosciences

 **IRCSS SANTA LUCIA** – ROME, ITALY

**RESEARCH ASSISTANT** – 02/2012 – 02/2016

Project: "Promoting and imaging restoration of brain function in Multiple Sclerosis" PI : Dr V.Tomassini

 **NEUROLOGICAL CENTRE OF LATIUM, NCL** – ROME, ITALY

**RESEARCH ASSISTANT** – 05/2009 – 05/2012

Magnetic Resonance Imaging acquisition Research Assistant for research protocols in Multiple Sclerosis

 **DPT OF NEUROLOGY AND PSYCHIATRY, SAPIENZA UNIVERSITY OF ROME** – ROME, ITALY

**CLINICAL TRIAL SUBINVESTIGATOR, GDX-44-004 STUDY PROTOCOL ON P03277 MRI CONTRAST AGENT, GUERBET** – 08/09/2016 – 08/01/2018

 **DPT OF NEUROLOGY AND PSYCHIATRY, SAPIENZA UNIVERSITY OF ROME** – ROME, ITALY

**CLINICAL TRIAL RESEARCHER BACKUP IN THE TENERE CLINICAL STUDY, SANOFI** – 07/2009 – 02/2014

 **DPT OF NEUROLOGY AND PSYCHIATRY, SAPIENZA UNIVERSITY OF ROME** – ROME, ITALY

**CLINICAL TRIAL RESEARCHER BACKUP IN THE CAMMS STUDY, GENZYME** – 07/2009 – 08/2010

 **SANTA LUCIA DEI FONTANILI SRL** – ROME, ITALY

**ON CALL MEDICAL SERVICE** – 01/09/2010 – 28/02/2012

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 **VILLA MONICA - CESIM SRL** – ROME, ITALY

**ON CALL MEDICAL SERVICE** – 01/05/2009 – 31/07/2010

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 **DPT OF NEUROLOGY AND PSYCHIATRY, SAPIENZA UNIVERSITY OF ROME** – ROME, ITALY

**POST-GRADUATE RESEARCH GRANT** – 04/05/2009 – 03/11/2009

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**"Conventional and not conventional Magnetic Resonance Neuroimages of Multiple Sclerosis at onset"**

## ● **EDUCATION AND TRAINING**

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26/09/2023 – CURRENT

**ICH GOOD CLINICAL PRACTICE E6 (R2)** The Global Health Network

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01/11/2022 – CURRENT ROME, Italy

**RESIDENT IN MEDICAL STATISTICS AND BIOMETRY** Dpt of Public Health and Hygiene, Sapienza University of Rome

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**Address** Piazzale Aldo Moro 5, 00185, ROME, Italy

01/11/2009 – 21/12/2012 Rome, Italy

**PHD IN NEUROSCIENCE** International/European PhD in Brain Plasticity and Rehabilitation XXV cycle

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Department of Psychology, Sapienza - University of Rome.  
Prof. Salvatore Maria AGLIOTI

01/10/2009 – 31/12/2009 Italy

**ITALIAN STATE ABILITATION TO THE MEDICAL PROFESSION** Italian State

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Examination on February 2010

1996 – 2008 Rome, Italy

**MEDICAL DOCTOR** Sapienza - University of Rome

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Final Grade: 98 (max 110)

Graduation Date: 30-06-2008

Age at graduation: 31

Starting Year : 1996

Official Duration of the Course: 6 years

Obligatory Thesis: Yes

Argument: Disorders of the Nervous System

Title of Thesis: "IMPACT OF PREGNANCY ON THE COURSE OF MULTIPLE SCLEROSIS IN PATIENTS TREATED WITH IMMUNOMODULATING THERAPY

Keywordse: Multiple Sclerosis Pregnancy Immunomodulation

Type of Thesis: EXPERIMENTAL

Coordinator: Prof. POZZILLI CARLO

Thesis duration (months): 13

10/09/1991 – 30/06/1994 Arta, Greece

**HIGHER EDUCATION - GREEK (APOLYTIRION)** Greek High School

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**Year of Graduation:** 1994

**Grade :** 18 and 9/11 (max 20)

## ● **LANGUAGE SKILLS**

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Mother tongue(s): **GREEK**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
<b>ENGLISH</b>	C2	C2	C1	C2	C2
<b>FRENCH</b>	B2	C2	B2	B2	B2
<b>ITALIAN</b>	C2	C2	C2	C2	C2

Levels: A1 and A2: Basic user - B1 and B2: Independent user - C1 and C2: Proficient user

## ● SKILLS

### Programming and Scripting

BASH Shell | SPSS | MATLAB | VBA | SQL | Git | R | Docker | JSON | Python | XML | NeuroBS Presentation

### Productivity

Microsoft Office | Libre/Open Office | PDF Editing

### Operating Systems

Windows XP/Vista/7/10 | Linux (RHEL, CentOS, Ubuntu, Debian) | MacOSX | iOS | Android

### Information Technology

Containerization | Cluster computing | Cloud computing | Hardware (Assembling/Troubleshooting) | Virtual Private Network (VPN) | XNAT | Virtualization Technology | Networking: LAN, WAN, WI-FI, TCP/IP, DHCP, DNS

## ● DRIVING LICENCE

Driving Licence: B

## ● JOB-RELATED SKILLS

### Job-related skills

- 3-year clinical experience in Multiple Sclerosis center
- clinical skills
- psychiatric clinic experience since 2018
- IT skills
- statistical methods, especially on neuroimaging
- stimulus-presentation systems for neuroscience experiments

## ● TEACHING, SEMINARS AND COMMUNICATIONS

### Speaker

INVITED SPEAKER: "Telemedicine and Multiple Sclerosis: Neurological examination and home Telerehabilitation", CME Event , Lazio Region Central Council, November 29, 2021, Rome, Italy

INVITED SPEAKER: "fMRI in Multiple Sclerosis", 7th National Congress of Neuroimmunology, December 10-13, 2020,Thessaloniki, Greece

HOSPITAL MEETING (Speaker): "Update after the American Academy in Neurology Annual Meeting, April 22-28, 2017, Boston USA" , Dpt of Neurology and Psychiatry, Sapienza University of Rome, Italy

SEMINAR (Speaker): "In vivo study of Neuroplasticity through fMRI", October 19th, 2016, Sant'Andrea Hospital, Sapienza University of Rome, Rome, Italy

SEMINAR (Speaker): "Functional Imaging and Neural Connectivity in MS in Neuroradiology Department" , October 30th, 2014 Portuguese Specialist Internship in Multiple Sclerosis Center University of Rome "Sapienza", Rome , Italy

## Congresses

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ORGANIZING COMMITTEE MEMBER: II National Congress of Functional Neuroradiology, Italian Association of Neuroradiology, 21-22 February 2013, Rome Italy

COMMUNICATIONS: POSTER and ORAL, since 2012 till today. in several italian-national and international congresses: ECTRIMS (European Committee for Treatment and Research In Multiple Sclerosis), SIN (Società Italiana Neurologia), AINR (Associazione Italiana NeuroRadiologia), AAN (American Academy of Neurology), ISMRM (International Society for Magnetic Resonance in Medicine) - The Italian Chapter, HBM (Human Brain Mapping) Annual Conference and elsewhere.

## GRANTS AND COMPETITIONS

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### Grants

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- January 2020: Winner of the Fondazione G.B. Baroni 2019 grant for Scientific Research with a project on Tele-Rehabilitation, Rome, Italy
- April 2009: Winner, Post-Graduate Research Grant on Neuroscience research, Sapienza – University of Rome, Italy

### Competitions

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- July 2020: Winner, public competition for professional collaboration on Neuroscience research project, Dpt of Physiology and Pharmacology "Vittorio Ersamer", Sapienza University of Rome, Italy
- October 2019: Winner, public competition for professional collaboration on Neuroscience research, Dpt of Human Neurosciences, Sapienza University of Rome, Italy
- October 2019: Winner, public competition for professional collaboration on Neuroscience research, Dpt of Human Neurosciences, Sapienza University of Rome, Italy
- June 2012: Winner, public competition for professional collaboration on Neuroscience research, Dpt of Neurology and Psychiatry, Sapienza University of Rome, Italy
- September 2010: Winner, public competition for professional collaboration on Neuroscience research, Dpt of Neurology and Psychiatry, Sapienza University of Rome, Italy
- July 2010: Winner, public competition for professional collaboration on Neuroscience research, Dpt of Neurology and Psychiatry, Sapienza University of Rome, Italy

## SCIENTIFIC PUBLICATIONS

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2009 – CURRENT

### Metrics (Scopus)

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Author in pubmed-indexed papers (source Scopus): 79

h-index: 24

Citations: 1669

### Selected Publications

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- Petsas N**, De Giglio L, González-Quintanilla V, Giuliani M, De Angelis F, Tona F, Carmellini M, Mainero C, Pozzilli C, Pantano P. Functional Connectivity Changes After Initial Treatment With Fingolimod in Multiple Sclerosis. *Front Neurol*. 2019 Mar 22;10:153. doi: 10.3389/fneur.2019.00153. PMID: 30967828; PMCID: PMC6438876.
- Piervincenzi C, **Petsas N\***, De Giglio L, Carmellini M, Giannì C, Tommasin S, Pozzilli C, Pantano P. Increased Within-Network Functional Connectivity May Predict NEDA Status in Fingolimod-Treated MS Patients. *Front Neurol* 2021 Mar 05 doi: 10.3389/fneur.2021.632917. (\* corresponding author)
- Tomassini V, d'Ambrosio A, **Petsas N**, Wise RG, Sbardella E, Allen M, Tona F, Fanelli F, Foster C, Carnì M, Gallo A, Pantano P, Pozzilli C. The effect of inflammation and its reduction on brain plasticity in multiple sclerosis: MRI evidence. *Hum Brain Mapp*. 2016 Jul;37(7):2431-45. doi: 10.1002/hbm.23184. Epub 2016 Mar 18. PMID: 26991559; PMCID: PMC5069650.
- Sbardella E, Tona F, **Petsas N**, Upadhyay N, Piattella MC, Filippini N, Prosperini L, Pozzilli C, Pantano P. Functional connectivity changes and their relationship with clinical disability and white matter integrity in patients with relapsing-remitting multiple sclerosis. *Mult Scler*. 2015 Nov;21(13):1681-92. doi: 10.1177/1352458514568826. Epub 2015 Jun 3. Erratum in: *Mult Scler*. 2016 Oct;22(12):NP12. PMID: 26041799.
- Prosperini L, **Petsas N**, Sbardella E, Pozzilli C, Pantano P. Far transfer effect associated with video game balance training in multiple sclerosis: from balance to cognition? *J Neurol*. 2015 Mar;262(3):774-6. doi: 10.1007/s00415-015-7640-8. Epub 2015 Jan 13. PMID: 25578180.

- **Petsas N**, Tomassini V, Filippini N, Sbardella E, Tona F, Piattella MC, Pozzilli C, Wise RG, Pantano P. Impaired Functional Connectivity Unmasked by Simple Repetitive Motor Task in Early Relapsing-Remitting Multiple Sclerosis. *Neurorehabil Neural Repair*. 2015 Jul;29(6):557-65. doi:10.1177/1545968314558600. Epub 2014 Nov 21. PMID: 25416740.
- **Petsas N**, Tinelli E, Lenzi D, Tomassini V, Sbardella E, Tona F, Raz E, Nucciarelli V, Pozzilli C, Pantano P. Evidence of impaired brain activity balance after passive sensorimotor stimulation in multiple sclerosis. *PLoS One*. 2013 Jun 14;8(6):e65315. doi: 10.1371/journal.pone.0065315. PMID: 23799005; PMCID: PMC3682993.
- Sbardella E, **Petsas N**, Tona F, Prosperini L, Raz E, Pace G, Pozzilli C, Pantano P. Assessing the correlation between grey and white matter damage with motor and cognitive impairment in multiple sclerosis patients. *PLoS One*. 2013 May 16;8(5):e63250. doi: 10.1371/journal.pone.0063250. PMID: 23696802; PMCID: PMC3655958.

## ● RESEARCH INTERESTS

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### Topics

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My early interest in Neuroscience led me, as a medicine student, to the first experiences with functional MRI in 1999. Later, I was inserted in a Multiple Sclerosis clinical research group, where the clinic met advanced neuroradiology methods.

In my PhD and post-doc years my interest focused on how the brain changes and adapts, in disease and therapeutic intervention, either pharmacological or rehabilitative (Petsas et al 2013; Petsas et al 2015). Longitudinal designs and methods for characterizing brain changes and elucidating neuroplasticity mechanisms with multi-modal MRI have become my main research focus (Petsas et al 2015; Petsas et al 2019; Piervincenzi, Petsas et al 2021).

I'm involved in two multicenter collaborative projects in Neuroscience, since their early phases: INNI - Italian Neuroimaging Network Initiative and RIN - IRCCS Network of Neuroscience and Neurorehabilitation. This allowed me a precious exchange in MRI methods, harmonization of protocols and multi-site implementation, both for behavioural and neuroimaging data acquisition.

In the last two years I'm also working on a Telerehabilitation project with innovative kinematic quantification (G.B. Baroni Foundation Grant 2020).

### Methods

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Updated methodological approaches have become central to my research work: the modern characterization of the brain as a network and its dynamics requests the manipulation of big data, methodological transparency, reproducibility and replicability. Multi-modal approaches, shared data structure and shared analysis pipelines have become part of my actual workflow.

I set up, acquire and analyse structural and functional brain MRI with most methods: task and rest functional MRI, diffusion-tensor tractography, volume and surface metrics, arterial spin labeling and other, often in longitudinal study designs and with behavioural/physiological data implementation. I'm proficient with different brand scanners, workstation hardware and software setup and troubleshooting, multiple statistical approaches, e.g. PCA/ICA or graph theory to produce connectomes on fMRI data. Moreover I have acquaintance with cerebral blood flow quantification, in experimental settings with breath-holding tasks and registration of physiological signals (e.g. end-tidal CO<sub>2</sub>).

## ● COMMUNICATION AND INTERPERSONAL SKILLS

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### Communication and interpersonal skills

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Exceptional interaction skills and approach to patient, gained through my clinical experience as an MD, integrating both empathic and rational approaches to obtain efficient communication and collaboration.

## ● ORGANISATIONAL SKILLS

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### Organisational skills

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-reference senior post-doc in university neuroimaging lab and hospital for more than 10 persons among post-docs, doctorate and graduating students, as well as health-care, administrative and technical personnel.  
 -guidance, formation and troubleshooting for lab members on technical, administrative and organizational issues; reference for personal guidance.  
 -clinical trials investigator and consultant  
 -liaison for patients participating for clinical protocols  
 -clinical and neuropsychological research protocol application and testing  
 -integration of Information Technology (IT) instruments and tools in neuroscience ; projectivity and evaluation of IT infrastructure efficiency; System Administrator of Neuroimaging Lab