

EADC Resident and Research Fellow Section (RRFS)

Exchange through internship programs

Name and location EADC hosting center

University of Siena, Siena, Italy

Link to center's website

<https://en.unisi.it/>

PI of the EADC hosting center

Prof. Domenico Plantone

Contact person of the EADC hosting center

Give full coordinates of the person that can be contacted by the RRFS member for additional information

Domenico Plantone, MD PhD

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Description of the center

Give a full description of main clinical and research activities

The Memory Clinic at the University of Siena is a renowned center specializing in the diagnosis, treatment, and research of cognitive disorders, including Alzheimer's disease, vascular dementia, frontotemporal dementia, and rare conditions such as limbic encephalitis, hereditary leukodystrophies, and prion diseases. As part of the European Reference Network for Rare Neurological Diseases (ERN-RND), the clinic provides comprehensive, consultant-led, multidisciplinary care involving neurology, neuropsychology, imaging, specialized nursing, and clinical genetics.

The center offers advanced diagnostic tools, such as MRI, EEG, PET, SPECT, and a dedicated lumbar puncture clinic for cerebrospinal fluid analysis. Patients requiring more extensive investigations benefit from a dedicated day hospital.

The research activities at the center are conducted in state-of-the-art laboratories, focusing on fluid and imaging biomarkers for neurodegenerative diseases. These include neuro-axonal injury markers (e.g., NfL), astroglial activation (e.g., GFAP), synaptic loss markers, and novel pathways linked to mitochondrial injury and inflammation. In addition, the center employs cutting-edge artificial intelligence techniques for neuroimaging analysis, such as automated segmentation of hippocampal atrophy, enabling rapid and precise assessments of disease progression.

The center also investigates environmental and occupational factors influencing neurodegeneration, such as air pollution, and explores the interplay between immune responses and neurodegenerative mechanisms, aiming to improve preventive and therapeutic strategies.

Internship program

Give a description of the contents of an internship program at the hosting center. If desirable, give separate descriptions for clinicians and for researchers. Indicate the optimal duration of an internship program (preferably max 4 weeks)

The Memory Clinic at the University of Siena offers a tailored internship program designed to provide a comprehensive experience in the field of cognitive disorders and neurodegeneration. The program is structured to accommodate both clinicians and researchers, ensuring exposure to the center's multidisciplinary expertise and advanced diagnostic tools.

For clinicians, the internship focuses on practical training in the diagnosis and management of cognitive disorders, including Alzheimer's disease, frontotemporal dementia, and other rare neurodegenerative conditions. Participants will engage in clinical case discussions, attend specialized outpatient clinics, and observe procedures such as cerebrospinal fluid sampling and advanced neuroimaging analysis techniques. Additionally, they will gain insights into the use of biomarkers and participate in multidisciplinary meetings.

For researchers, the program emphasizes hands-on experience with biomarker analysis, neuroimaging techniques, and the use of artificial intelligence tools for data processing. Participants will have the opportunity to join ongoing research projects in areas such as neuro-axonal injury, astroglial activation, mitochondrial damage, and environmental factors in neurodegeneration. They will also learn advanced methodologies for analyzing clinical and imaging data, with a focus on translational research.