

## A physical approach to AD pathogenesis and treatment

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### Abstract

The biological mechanisms responsible for clinical conlaminated Alzheimer's Disease (AD) are very elusive and many hypotheses so far proposed (tau, amyloid) are not conclusive or at least are not able to early predict the disease progression. Among them, the role played by possible alterations in brain iron metabolism is very attractive. Our group is actively working in this field performing accurate measurements of the total iron content and speciation in serum and Cerebro-Spinal Fluid (CSF) as well as investigating iron transport across the Blood Brain Barrier (BBB) in physiological and pre-clinical AD. Data are correlated with other consolidated biomarkers using modern mathematical techniques based on machine learning algorithms. The goal is that of producing a personalized profile of iron metabolism as preliminary diagnostic item for therapies based on iron chelation and magnetic driving.



### Biography

Caterina Guiot is a physicist and she did her PhD in Physiology. Now she currently works as a professor in Applied Physics at the Neuroscience Dept of the University of Torino. She is involved in research on physical and computational modeling in medicine and theranostic nanodevices. She has over 100 publications and is co-author of several patents.

### Publications

1. Superparamagnetic Oxygen-Loaded Nanobubbles to Enhance Tumor Oxygenation During Hyperthermia
2. Double-layered models can explain macro and micro structure of human sleep
3. A novel approach to the analysis of human growth
4. Criteria and scheduling of quality control of B-mode and doppler ultrasonography equipment
5. Review: Feto-placental vascularization: a multifaceted approach
6. Oscillations in growth of multicellular tumour spheroids: a revisited quantitative analysis
7. Non-linear recurrence analysis of NREM human sleep microstructure discloses deterministic oscillation patterns related to sleep stage transitions and sleep maintenance

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