

CURRENT POSITION:

Associate Professor (2019 to present) - University of Udine

Visiting Professor in the Centre for Amyloidosis and Acute Phase Proteins, UCL (2017 to present).

She recently obtained the National Qualification as Full Professor in the competition sector 02/D1 - APPLIED PHYSICS, EDUCATION AND HISTORY OF PHYSICS valid for eleven years starting from 11/01/2023

POSTS HELD:

2016- 2017 Sabbatical leave. Research activity held in the Centre for Amyloidosis and Acute Phase Proteins, UCL, London UK

1999-2019 Assistant Professor University of Udine, Italy

1995-1999 Post-Doc University of Padova, Italy

1994 -1995 Assistant Researcher Birkbeck College, Chemistry Dept, London, UK

QUALIFICATIONS:

1993 PhD in Biophysics University of Padova, Italy

1989 Degree in Physics (cum laude) University of Bologna, Italy

GRANTS:

- 2023-2025 TELETHON MULTIROUND 21-24 – ROUND 1 2022 TRACK BASIC - PI of the project “Study of the amyloidogenic conversion of V30M, S52P and V122I transthyretin variants by real-time Nuclear Magnetic Resonance: elucidation of the molecular mechanisms leading to different ATTR amyloidosis severity and different drug response”.

- 2022-2024 Pfizer Global Medical Grants “New perspectives in proteolysis-mediated mechanism of transthyretin related amyloidosis: the role of mechanic forces” – co-PI of the project.

- 2018-2022 "TDP-43 STRUCT - Purification and Structure Determination of Full-Length TDP-43"

- 2007 PRIN (responsabile di unità locale) "Caratterizzazione strutturale e dinamica di proteine amiloidogeniche."

- 2005 PRIN (responsabile di unità locale) "Studi NMR e di spettrometria di massa su beta2-microglobulina, acilfosfatasi e apolipoproteina-A1: correlazione tra struttura, dinamica e aggregazione."

RESEARCH SUMMARY:

Her research interest is currently focused on understanding the molecular mechanisms underlying the transformation by which native proteins convert into aggregation-prone partially folded states and finally into amyloidogenic fibrils. On this topic, she has carried out NMR studies of the structure and dynamics of transthyretin, beta-2-microglobulin, TDP-43 and acylphosphatase.

Her research activity started studying the surface electrical potential of chromatophores membrane from photosynthetic bacteria. The work was conducted both experimentally, using redox potentiometry in combination with fast kinetic spectroscopy, and computationally, with the analysis of different solution of the Gouy-Chapman model of the diffuse double layer. Although different topics will be the focus of her activity, the combination of experimental and computational work remained a hallmark of her scientific research. Later, she approached ESR and NMR spectroscopy focusing on the investigation of metalloenzymes and in particular of amino-oxidases. The conformation of Bovine Serum Amino Oxidase active site was dissected by probing the interaction with many different substrates with different biophysical characteristics. She also designed and

characterized peptides able to bind metals, in particular copper ions, and to display enzymatic activity. Her activity in the bio-inorganic field proceeded with the characterisation of the copper-gluthathione system. Moreover, she worked on anti-cancer drugs, analogue of cisplatin, and she studied their binding properties to synthetic oligonucleotides. During this period, she moved toward protein NMR, by studying the interaction of the oligonucleotide-cisplatin complex to Human High Mobility Group Protein 1.

In 1999 she was appointed assistant professor at University of Udine where in the group of Biophysics she deepened her interest in structural biology. Since 2000 her main interest is in the field of protein misfolding. In particular the structural characterization in solution of beta2-microglobulin (b2m), principal component of amyloid fibers in Dialysis Related Amyloidosis (DRA), was achieved. In the attempt of understanding the mechanisms of fiber formation, in collaboration with the group of Prof. V. Bellotti and F. Chiti, structural studies were extended to different b2m variants and to acylphosphatases of different organisms. The interaction of b2m with small molecules like doxycycline, now used in the clinics for the treatment of DRA, was characterized along with doxycycline inhibitory effect on fibril formation. Similarly, the protective effect of the chaperone alpha-crystallin on b2m aggregation was studied. She contributed, by molecular dynamics simulation, in the identification of a b2m residue crucial in the first aggregation events. Its mutation in fact proved the complete inhibition of fibril formation.

She studied b2m folding intermediates by real-time NMR using fast innovative techniques and by hydrogen/deuterium exchange she characterized the kinetics and thermodynamics of protein folding and unfolding.

In 2016 she joined, for a sabbatical year, the laboratory of Prof. V. Bellotti at the Centre for Amyloidosis and Acute Phase Proteins, UCL, in London where she became involved in a project, still active, aimed at the identifications of the structural hot-points of transthyretin, a tetrameric protein responsible for systemic amyloidosis. She is also studying the role of protein dynamics of wild type TTR and of several pathologic variants and she's actively engaged in the identification of ligands capable of fibril formation abrogation.

She is co-author of 9 protein structures released in the Protein Data Bank.

She is co-author of 84 peer-reviewed publications in International journals.

Hindex: 25 (Web of Science).

An agreement between University of Udine and "Centro Grandi Strumenti" of University of Pavia, that recently acquired a 700 NMR spectrometer, has been signed widening the possibility of instruments available for her research.

PROFESSIONAL ACTIVITIES:

- 2021- Coordinator of PhD in Biomedical and Biotechnological Sciences at University of Udine.
- Member of Consorzio Nazionale Biosistemi Biostrutture
- Member of GiDRM (Italian Discussion Group of Magnetic Resonance)

NATIONAL AND INTERNATIONAL COLLABORATIONS

Prof. V. Bellotti (University of Pavia, UCL London UK), Prof. J. Christodoulou (UCL, London UK), Prof. F. Chiti (University of Firenze), B. Brutscher (Centre de Biologie Structurale, Grenoble, France), M. Dumoulin (University of Liège, Belgium).