

EUROBIC Medal 2012 for Angela Casini, University of Groningen, The Netherlands



The Eurobic Award was erected after the Eurobic conferences were established and soon settled a new tradition to honor promising young, and other bioinorganic chemists deserving an honor of high caliber. The first medalist was Fred Hagen (1994; currently professor at Delft, NL); since then every 2 year a medal was granted, after a basic endowment fund had been created.

Previous EUROBIC medalists in Bioinorganic Chemistry have worked on a variety of topics, and many have come from the "Bio" side (or from physical biochemistry), and having their research centered around metal-protein chemistry, be it mechanistic, structural, or spectroscopic. This year the winner is working in a field that can best be described as medicinal inorganic chemistry.

Angela Casini, a recently appointed assistant professor in pharmaceutical sciences, receives the medal as recognition of her contributions to further the basic understanding of molecular interactions of metal-based drugs with cellular components.

Born in 1973 in Firenze, Italy, Angela Casini received her academic education at the University of Florence and earned her Ph.D. degree in 2004, with a thesis topic: "*Carbonic Anhydrase Inhibitors with possible pharmacological applications*". The PhD was followed by 3 postdoc periods, in subsequently, Pisa, Florence and Lausanne. From September 2008 she was Senior scientist at the Institut des Sciences et Ingénierie Chimiques, at the EPFL (Lausanne, Switzerland) funded by the Swiss National Science Foundation (AMBIZIONE program, project title: "*Exploring the mechanisms of metal-based pharmacological agents via an integrated approach*"), till she took her present position in Groningen in September 2011 being funded with a Rosalind Franklin Fellowship.

Her most recent achievements from the SNF and Rosalind Franklin grant have been dealing with the study of the interactions of metal-based (mainly based on Ru, Au, Pt) anticancer compounds, as it also appears from her recent papers.

Her major findings that form the basis for this Award, have dealt with biomolecules, in particular proteins that could possibly be important targets for the pharmacological and toxicological activity of this type of metal-based drugs. The study of the role of metal ions in their pharmacological action and in patho-physiological states is the focus of her current independent, successful research program. She has made major progress in recent years with a number of topics, from which the important ones are:

- a) Synthesis of new anticancer gold complexes a project started with prof. Messori in Firenze.
- b) Molecular investigations of metal interactions with biologically active ligands,
- c) Structure-function relationships studies of metal compounds with pharmacological properties,
- d) Development of *in vitro* assays for anticancer metallodrug screening (e.g. 3D cell cultures),
- e) Development of methods to evaluate the inhibition of metalloenzymes by metal compounds.
- f) Development of metal-based theranostic agents,

g) Design of metal compounds as possible modulators of the activity of the membrane water channels aquaporins with either different therapeutic applications, or as molecular biological tools.

Several of her papers in the last 3-5 year deal in detail with findings from the above topics. To perform high-level research activities on these topics, it is required that application of a variety of chemico-physical techniques is mastered, like high-resolution mass spectrometry (both molecular and elemental sensitive) and X-ray crystallography. Dr. Casini has demonstrated that she can use these techniques on a high level, coupling them to biochemical and pharmacological approaches, such as cell fractionation, protein expression and purification, cell culture and cytotoxicity screening, high-throughput screening of enzyme activity, and fluorescence microscopy analysis. Overall, her research skills do cover highly interdisciplinary research areas ranging from Inorganic/Medicinal Chemistry, Molecular Biology, Biophysics and Pharmacology.

In addition to her local research activities, Dr. Casini has also actively participated in several international cooperation programs relative to the medicinal chemistry of metal coordination compounds, from which EU COST should be mentioned in particular. Given her several activities Dr. Casini has also been regularly invited to deliver seminars in a variety of institutions in several countries of Europe. Despite her relatively young age she is already author of well over 100 publications (since 2000) in internationally recognized and peer reviewed journals, where she often appears, especially in recent years, as the corresponding author. Europe and the Eurobic community should be proud to have such a promising young scientist amongst them.

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