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Stereochemistry and inorganic medicinal chemistry

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Stereochemistry is central to almost every aspect of Chemical Sciences. However, regarding coordination compounds, stereochemistry may even be more significant due to its intrinsic richness within the metal complexes, as the coordination numbers are typically variable and occasionally quite high, which generates a variety of geometries and isomers. Since the serendipitous discovery of the antitumor activity of the complex cis-diamminedichloroplatinum(II), cisplatin, in the sixties by Rosenberg and co-workers, Inorganic Chemistry definitively earned its place in the field of Medicinal Chemistry. Interestingly, the trans- isomer is not active, showing the importance of a specific spatial arrangement in order to reach the desirable action. In this speech, some examples of the relevance that stereochemistry possesses in Inorganic Medicinal Chemistry will be discussed, including some derived from our own experience in the subject. Amongst the latter, special attention will be given to the antitumor potential of bioinspired synthetic hydrolases containing a dicopper (II) core and to the usefulness of the (E)-isomers of some compounds belonging to the chemical class of hydrazones as “Metal-Protein Attenuating Compounds” for the treatment of neurodegenerative diseases, such as Alzheimer’s.

Biography

Nicolás A Rey has completed his PhD degree in Inorganic Chemistry from the Federal University of Santa Catarina (Brazil) in 2008. Currently, he is an Associate Professor at the Department of Chemistry of PUC-Rio, Rio de Janeiro, where he coordinates the Laboratory of Organic Synthesis and Coordination Chemistry Applied to Biological Systems (LABSO-BIO). He has authored 25 papers in several distinguished peer-reviewed journals and has a patent concerning the use of a compound belonging to the chemical class of hydrazones in the treatment of neurodegenerative diseases. His research interest is in the field of bioinorganic and inorganic medicinal chemistry.

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