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Featuring the nucleosome surface as a therapeutic target

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Chromatin is the major regulator of gene expression and genome maintenance. Proteins that bind the nucleosome, the repetitive unit of chromatin, and the Histone H4 tail are critical to establish chromatin architecture and phenotypic outcomes. Intriguingly, nucleosome-binding proteins (NBPs) and H4 tail peptide compete for the same binding site at an acidic region on the nucleosome surface. Although the essential facts about the nucleosome were already revealed 17 years ago, new insights into its atomic structure and molecular mechanisms are still emerging. In this talk, I will feature the nucleosome surface as a drug target to control chromatindynamics and, consequently, gene expression and genome maintenance. I will cover the key aspects of chromatin architecture upon binding of protein and exogenous molecules (exogenous Nucleosome Binding Molecules - eNBMs) to the nucleosome. Moreover, I will discuss the impact and development of eNBMs, presenting some of our results in silico, in vitro and in cell-based assays.

Biography

Guilherme Martins Santos completed his Bachelor in Veterinary Medicine in 1997, at the University of Uberlandia, Brazil. In 1998, he started his masters studies in the University of Brasilia, and then went on to do a PhD in Molecular Pharmacology at the University of Brasilia and INSERM-Paris, France. In 2006 he went to the UK to start a post-doc at the MRC-Laboratory of Molecular biology in Cambridge, followed by a post-doc at the University of Leicester, focused on the structural studies of nuclear receptor and chromatin. He is currently a Professor of Pharmacology of the Pharmacy School at the Universidade de Brasilia. He has published several articles in important journals such as Nature, Cell and Trends in Pharmacological Science. In April 2015, he founded Nucleosantos Therapeutics, a start-up that is working on the discovery and development of exogenous Nucleosome-Binding Molecules.

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