Dr Gustavo de Souza

Dr. Gustavo de Souza has education in Biology (1999), and a PhD degree in Cell Biology at the Medicine School of the University of Sao Paulo (USP) (2004). After a two year postdoctoral fellowship at the Dept. of Proteomics and Signal Transduction under direction of Dr. Matthias Mann (Max Planck Institute, Martinsried, Germany), he joined the Gade Institute, University of Bergen, as an Associate Researcher in 2007 to investigate *Mycobacterium tuberculosis* biology using state-of-the-art mass spectrometry. He is currently hired at the Proteomic Unit of the University of Bergen, where he focuses his research in characterizing virulence factors of clinical isolates of *M. tuberculosis* and *Escherichia coli* using label-free methods.

During the "Quantitative Proteomic Course" in Bergen June 7th – 11th 2010, he will give one lecture that will be free to attend for people at UiB.

Lecture: Wednesday, June 9th in Auditorium 4 of BBB, kl. 09:00 – 10:00

SILAC: Approach and Applications

Stable Isotope Labeling of Amino acid in Culture (SILAC) is one of the most elegant methods for labeling of the whole proteome of a cell culture or unicellular organism. Its principle lies in the fact that such cells does require essential amino acids (leucine, arginine and lysine) supplied in the media for growth and maintenance. Therefore, the implementation of the media with these amino acids containing C13 or N15 atoms is possible, characterizing a typical metabolic labeling. It has been show that such isotopic amino acids do not alter cell growth and cell functionality for several established cell lines, which allow the use of this method in several experimental setups as cell differentiation. This seminar will focus in the original publication of SILAC, and application examples where this method has been used over the last 8 years, including signaling pathway characterization and the identification of specific interaction partners. A brief overview about data analysis challenges will also be discussed. Finally, even an elegant method has its limitations. SILAC can only be applied in experimental designs where the target of the study can be kept in culture for at least 5 doubling times, which means this approach is not applicable to investigate isolated primary cells with slow or no growth in culture, body fluids or tissue samples. However, some attempts have been done to cover these limitations, as the super-SILAC approach, which will also be discussed.