UNIVERSITÄT DES SAARLANDES

Med Chem seminar

Thursday 5. December, 13.00 – 14, Auditorium 1, School of Pharmacy, The University of Oslo

Professor Dr. Claus Jacob

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Sulfur, selenium and Tellurium in Biology: From antioxidant activity to complex redox modulation and intracellular signalling

Research conducted during the last decade has indicated that certain organosulfur, -selenium and -tellurium compounds exert a rather diverse biological activity based on redox modulation of pre-existing intracellular redox states. Such compounds may act as pro- or antioxidants (or both), depending on their precise redox properties and the cellular (redox-) environment they are placed in. Certain selenium and tellurium compounds also bearing quinone redox centres or metal-binding sites, for instance, are potent redox modulators able to modify the 'cellular thiolstat' and hence to interfere with various cellular signalling events. As these interferences may result in cell cycle arrest and the induction of apoptosis in cells particularly rich in ROS, such chalcogen-based 'sensor/effector' agents bear considerable promise as effective, yet selective cytotoxic agents against a range of important therapeutic targets, including cancer cells under oxidative stress, 'out of control' macrophages, scleroderma fibroblasts and diverse redox-sensitive pathogenic fungi, plasmodia and bacteria.

As part of this lecture, we will consider the synthesis of novel chalcogen-compounds and their interactions with the living cell. Here, we will demonstrate that modern and often just emerging new techniques can be used to elucidate the activity of such compounds as part of modern 'intracellular diagnostics'.

[1] M. Doering, *et al.*, *Tetrahedron*, 68, 10577-10585 (2012). [2] W. Marut, *et al.*, *J. Invest. Dermatol.,* 132, 1125-1132 (2012). [3] M. Doering, *et al.*, *J. Med. Chem.*, 53, 6954-6963 (2010). [4] P. Du, *et al.*, MedChemComm DOI: 10.1039/C3MD00204G

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