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# Mapping membrane protein signal transduction using synchrotron induced hydroxyl-radical footprinting: A GPCR study

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Despite the great structural discoveries in the last decades of intensive research in the field of the G-protein coupled receptors (GPCRs), many questions remain unanswered. These integral membrane proteins bind an array of different ligands allowing for signal transduction across the cell membrane. GPCRs are of huge pharmaceutical importance as almost half of all prescribed drugs act on GPCRs. The past 5-10 years have produced a number of crystal structures of various GPCRs, revealing roles for water in the activation process, structural transformations accompanying receptor activation and ligand binding modes. However, many open questions remain regarding the mechanism of activation of GPCRs remain unsolved. For example, because of the highly conserved overall structures observed for various GPCRs it is very difficult to derive the molecular mechanisms underlying different physiological activities of this membrane protein class based on static structural information alone. The talk will describe, in great detail, the changes of water channel in β-1 adrenergic receptor (β1-AR) for all pharmacologically important drug classes. Synchrotron induced oxidative footprinting (FP) has a great capability to sense solvent accessible surface in general and structural waters in particular. Therefore, coupled FP with mass spectrometry is indispensable technology in understanding subtle changes induced by GPCR during signal transduction.

## Biography

Sasa Bjelic has completed his Ph.D. at University of Zürich, Switzerland, and postdoctoral studies from Paul-Scherrer-Institute (PSI) in crystallography and protein footprinting. He then moved in the lab of Prof. Mark R. Chance at CWRU for in depth training in protein footprinting. He has published more than 17 papers in reputed journals on protein ligand interactions.

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