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Copper coordination in the Glycine receptor by electron spin resonance SHARON RUTHSTEIN, KATHERINE STONE, University of Pittsburgh, MICHAEL CASCIO, Univesity of Pittsburgh School of Medicine, SUNIL SAXENA, University of Pittsburgh, SUNIL SAXENA'S GROUP TEAM, MICHAEL CASCIO'S GROUP TEAM — We describe the use of Electron Spin Resonance (ESR) to identify the coordination environment of copper in the extracellular domain of the protein, as well as the number of copper atoms that bind to Glycine receptor (GlyR). The GlyR channel mediates inhibitory neurotransmission in the central nervous system. It belongs to the superfamily of nicotincoid receptors. These receptors are formed by pentameric arrangement of subunits, each sharing a common topology having a large extracellular domain (ECD) and a transmembrane (TM) domain comprised of four membrane-spanning segments (TM1-TM4). For GlyR, four subunits (1-4) and one subunit have been identified to date, although the homomeric expression of just the $\alpha 1$ subunit of GlyR is sufficient to reconstitute native-like activity. The results are expected to shed light on the role of metals ion in modulating ion permeation in such receptor. In addition, an identification of copper binding sites will allow the measurement of large range distance constraints in the receptor by pulsed ESR. Such structural information on the GlyR in various allosteric states is essential in order to shed light on the gating mechanism of this protein membrane.

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