

CRYOEM RECONSTRUCTIONS OF MEMBRANE PROTEINS SOLVED IN SEVERAL AMPHIPATHIC SOLVENTS, NANODISC, AMPHIPOL AND DETERGENTS, YIELD AMPHIPATHIC BELTS OF SIMILAR SIZES CORRESPONDING TO A COMMON ORDERED SOLVENT LAYER

V. ZAMPIERI¹, A. GOBET², X. ROBERT², P. FALSON², V. CHAPTAL²

¹EMBL - Grenoble (France), ²MMSB - Lyon (France)

To maintain membrane proteins soluble in aqueous solution, amphipathic compounds are used to shield the hydrophobic patch of their membrane insertion, which forms a belt around the protein. This amphipathic belt is seldom looked at due to the difficulty to visualize it. Cryo-EM is now offering this possibility, where belts are visible in 3D reconstructions. We investigated membrane proteins solved in nanodiscs, amphipols or detergents to analyze whether the nature of the amphipathic compound influences the belt size in 3D reconstructions. We identified belt boundaries in map-density distributions and measured distances for every reconstruction. We showed that all the belts create on average similar reconstructions, whether they originate from the same protein, or from protein from different shapes and structures. There is no difference among detergents or types of nanodisc used. These observations illustrate that the belt observed in 3D reconstructions corresponds to the minimum ordered layer around membrane proteins.

