

Hetero-oligomerisation of plant plasma membrane aquaporins

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Aquaporins are water channels present in biological membranes. They assemble as tetramers but monomers are the functional units. Among plant aquaporins, the *Plasma membrane Intrinsic Proteins* (or PIPs) cluster in two groups (PIP1 and PIP2) exhibiting different water channel activity when expressed in *Xenopus* oocytes. Interestingly, PIP1 and PIP2 proteins form heterotetramers resulting in regulation of their localisation and transport activity (Fetter *et al.*, 2004 ; Zelazny *et al.*, 2007; Bellati *et al.*, 2010 ; Otto *et al.*, 2010). We also showed that PIP heterotetramers is composed by two homodimers. However, less is known concerning the interacting motifs between monomers. We focused on maize ZmPIP1;2 and ZmPIP2;5 heterotetramers and generated models of the complex by satisfaction of spatial restraints, using the Modeller program (Eswar *et al.*, 2006). Models were then analysed using the Protein Interaction Calculator tool (Tina *et al.*, 2007) and we identified putative important interacting residues between monomers. Some of them were mutated and the proteins expressed in *Xenopus* oocytes to carry out swelling experiments. Preliminary experiments allowed us to identify several residues in ZmPIP2;5 and ZmPIP1;2 that had an impact on the water permeability of the cell membrane.