

## Publication

Assessing the structure of membrane proteins : combining different methods gives the full picture

## JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

ID 153234

Author(s) Stahlberg, Henning; Engel, Andreas; Philippsen, Ansgar

Author(s) at UniBasel Engel, Andreas ; Stahlberg, Henning ;

Year 2002

**Title** Assessing the structure of membrane proteins : combining different methods gives the full picture **Journal** Biochemistry and Cell Biology

**Volume** 80

Number 5

## Pages / Article-Number 563-8

Keywords AQP1, GlpF, F-ATPase, XRD, electron crystallography, AFM

The rotor stoichiometry of F-ATPases has been revealed by the combined approaches of X-ray diffraction (XRD), electron crystallography, and atomic force microscopy (AFM). XRD showed the rotor from the yeast mitochondrial F-ATPase to contain 10 subunits. AFM was used to visualize the tetradecameric chloroplast rotors, and electron crystallography and AFM together revealed the rotors from Ilyobacter tartaricus to be composed of 11 subunits. While biochemical methods had determined an approximate stoichiometric value, precise measurements and new insights into a species-dependent rotor stoichiometry became available by applying the three structural tools together. The structures of AQP1, a water channel, and G1pF, a glycerol channel, were determined by electron crystallography and XRD. The combination of both of these structural tools with molecular dynamics simulations gave a differentiated description of the mechanisms determining the selectivity of water and glycerol channels. This illustrates that the combination of different methods in structural biology reveals more than each method alone.

Publisher National Research Council of Canada ISSN/ISBN 0829-8211 edoc-URL http://edoc.unibas.ch/dok/A5257648 Full Text on edoc No; Digital Object Identifier DOI 10.1139/O02-160 PubMed ID http://www.ncbi.nlm.nih.gov/pubmed/12440697 ISI-Number WOS:000182660100009 Document type (ISI) Journal Article, Review