A high-molecular-weight complex of membrane proteins BAP29/BAP31 is involved in the retention of membrane-bound IgD in the endoplasmic reticulum

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

ID 153351
Author(s) Schamel, WWA; Kuppig, S; Becker, B; Gimborn, K; Hauri, HP; Reth, M
Author(s) at UniBasel Hauri, Hans-Peter ;
Year 2003
Title A high-molecular-weight complex of membrane proteins BAP29/BAP31 is involved in the retention of membrane-bound IgD in the endoplasmic reticulum
Journal Proceedings of the National Academy of Sciences of the United States of America
Volume 100
Number 17
Pages / **Article-Number** 9861-9866
Keywords Animals; Antigens; CD/metabolism; CD79; Binding Sites; CHO Cells; COS Cells; Cell Line; Cricetinae; Dimerization; Drosophila melanogaster; Endoplasmic Reticulum/*immunology/*metabolism; Immunoglobulin D/chemistry/*metabolism; Intracellular Membranes/immunology/metabolism; Macromolecular Substances; Membrane Proteins/*chemistry/genetics/*metabolism; Mice; Molecular Weight; Receptors; Antigen; B-Cell/metabolism; Recombinant Fusion Proteins/chemistry/genetics/metabolism

B cell antigen receptors (BCRs) are multimeric transmembrane protein complexes comprising membrane-bound immunoglobulins (mIgs) and Ig-alpha/Ig-beta heterodimers. In most cases, transport of mIgs from the endoplasmic reticulum (ER) to the cell surface requires assembly with the Ig-alpha/Ig-beta subunits. In addition to Ig-alpha/Ig-beta, mIg molecules also bind two ER-resident membrane proteins, BAP29 and BAP31, and the chaperone heavy chain binding protein (BiP). In this article, we show that neither Ig-alpha/Ig-beta nor BAP29/BAP31 nor BiP bind simultaneously to the same mIgD molecule. Blue native PAGE revealed that only a minor fraction of intracellular mIgD is associated with high-molecular-weight BAP29/BAP31 complexes. BAP-binding to mIgs was found to correlate with ER retention of chimeric mIgD molecules. On high-level expression in Drosophila melanogaster S2 cells, mIgD molecules were detected on the cell surface in the absence of Ig-alpha/Ig-beta. This aberrant transport was prevented by coexpression of BAP29 and BAP31. Thus, BAP complexes contribute to ER retention of mIg complexes that are not bound to Ig-alpha/Ig-beta. Furthermore, the mechanism of ER retention of both BAP31 and mIgD is not through retrieval from a post-ER compartment, but true ER retention. In conclusion, BAP29 and BAP31 might be the long sought after retention proteins and/or chaperones that act on transmembrane regions of various proteins.

Publisher National Academy of Sciences
ISSN/ISBN 0027-8424
edoc-URL http://edoc.unibas.ch/dok/A5257754
Full Text on edoc No;
Digital Object Identifier DOI 10.1073/pnas.1633363100
PubMed ID http://www.ncbi.nlm.nih.gov/pubmed/12886015
ISI-Number WOS:000184926000043
Document type (ISI) Journal Article