

Tamio Yamakawa Award 2016  
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## The making of N-glycoproteins

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N-linked protein glycosylation is the most frequent post-translational modification in eukaryotic cells. The essential process initiates in the Endoplasmic Reticulum (ER), where an oligosaccharide is assembled on the lipid carrier, dolichylpyrophosphate. Oligosaccharyltransferase transfers the oligosaccharide to selected AsN-X-Ser/Thr sequons (X = any amino acid residue except proline) of polypeptides that enter the lumen of the ER. N-linked glycans then serve as signaling molecules that display the folding status of the attached protein. This signal directs the folding and quality control machinery to the client glycoproteins. Properly folded secretory glycoproteins are directed towards the Golgi compartment where trimming and remodeling of N-linked glycans occurs in a species-, protein- and site specific manner.

Based on experimental approaches in pro- and eukaryotic model systems, the underlying molecular concepts of the N-glycosylation process and the quality control process in the ER as well as the remodeling of the N-linked glycan in the Golgi will be discussed. It is proposed that in the ER, N-linked glycans are major determinants for the folding of glycoproteins whereas the interaction of the glycan with the folded protein has a strong impact on the remodeling of the N-glycan in the Golgi.