**INFLUENCE OF *N*-GLYCOSYLATION ON HORSERADISH PEROXIDASE STABILIZATION**

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Horseradish peroxidase (HRP) is an enzyme that catalyzes H2O2 dependent oxidation of a wide variety of substrates. HRP contains four structurally essential disulfide bonds and two calcium ions, and moreover, requires presence of a heme cofactor to be functional. Martell and coworkers introduced an active form of split horseradish peroxidase (sHRP), showcasing its potential application in elucidation of communication mechanisms between a varieties of cell types in protein–protein interactions [1]. HRP and sHRP contain nine and eight *N*-linked glycosylation sites, respecitively, which are of particular importance, as it is established that glycosylation plays an essential role in HRP and sHRP activity.

To obtain a detailed understanding of the influence of *N*-glycosylation on HRP and sHRP, we performed a series of molecular dynamics (MD) simulations with and without *N*-glycosylation on HRP and sHRP. Thereby we also considered three previously elucidated glycoforms of both proteins [2]. In this respect, we find that the conformations of both HRP and sHRP are stabilized when *N*-glycosylation is introduced, with no significant difference between different glycoforms. Nevertheless, we find that the most stable glycoform matches with the highest degree of *N*-glycosylation. The obtained results suggest that glycans protect specific parts of the protein surface of both investigated forms of protein. This finding implies that glycosylation represents an important feature for horseradish peroxide protein stability and its function, being in agreement with previous studies regarding glycosylation effects [3].

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