

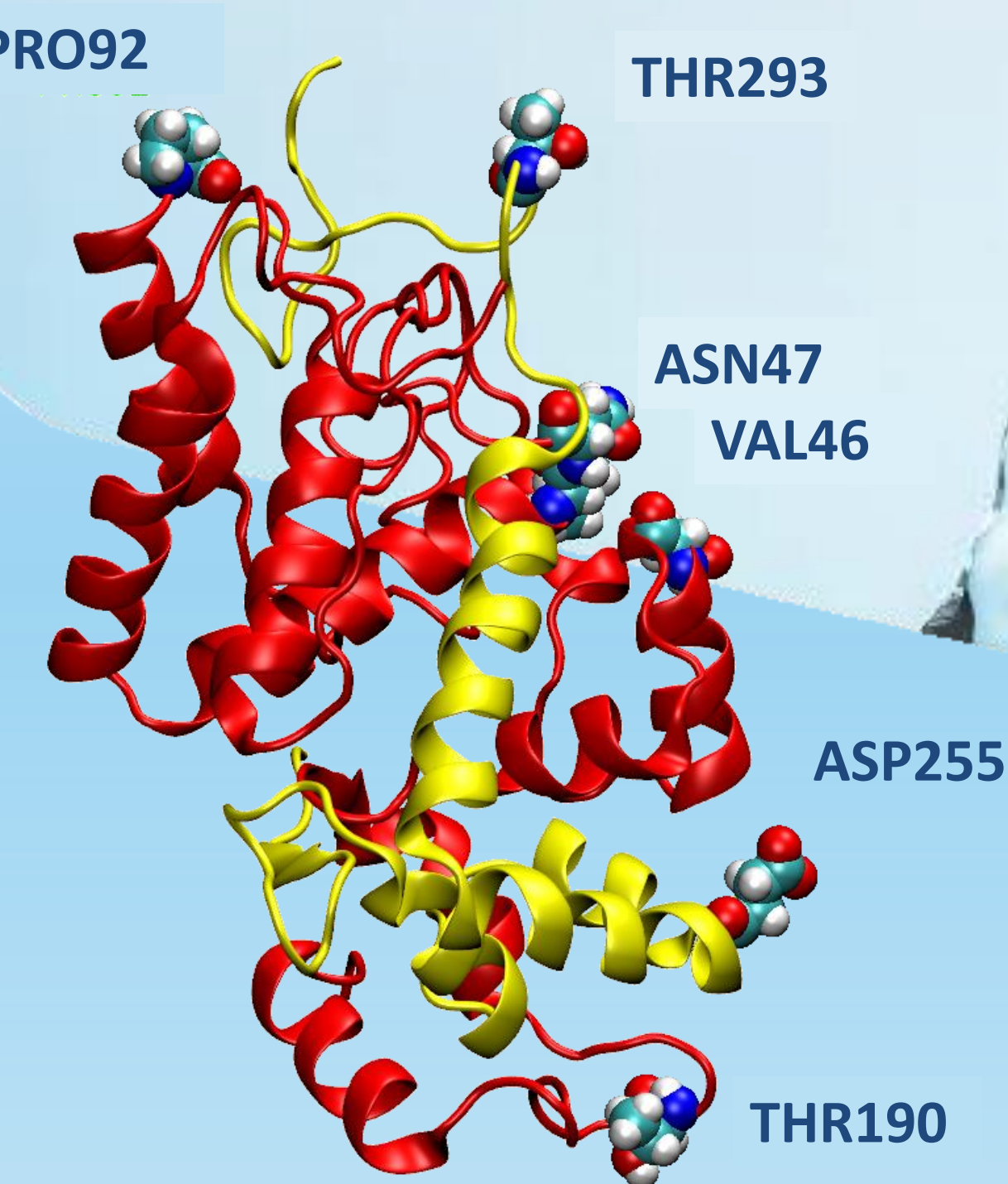
INFLUENCE OF N-GLYCOSYLATION ON HORSERADISH PEROXIDASE STABILIZATION

Sanja Škulj, Antun Barišić, Zoe Jelić Matošević, Branimir Bertoša

e-mail: bbertosa@chem.pmf.hr

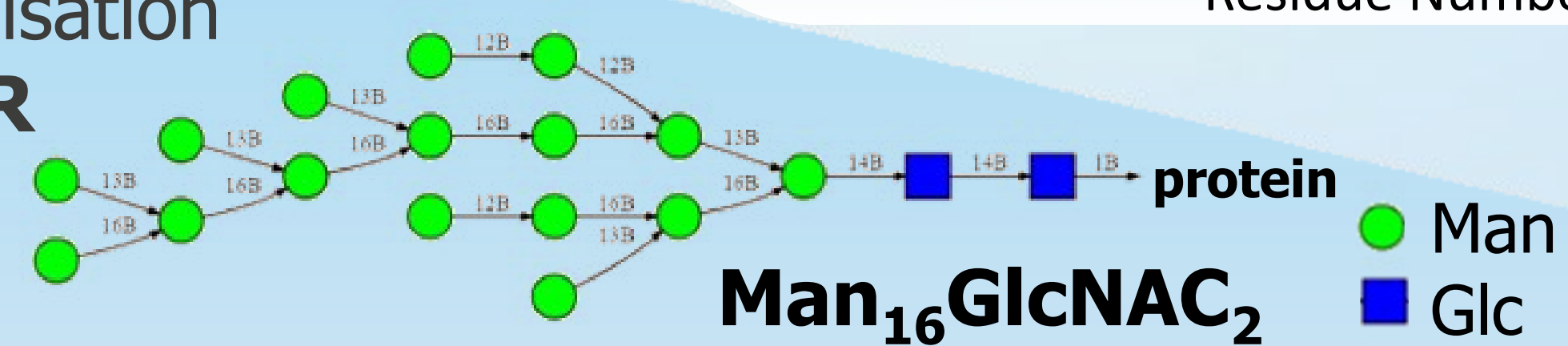


Horseradish peroxidase (HRP) is an enzyme that catalyses H_2O_2 dependent oxidation of a wide variety of substrates. Martell and coworkers introduced an active form of **split horseradish peroxidase (sHRP)**, showcasing its potential application in elucidation of communication mechanisms between a variety of cell types in protein–protein interactions [1]. **HRP** and **sHRP** contain nine and eight *N*-linked glycosylation sites, respectively, which are of particular importance, as it is established that **glycosylation plays an essential role in HRP and sHRP activity** [2,3].

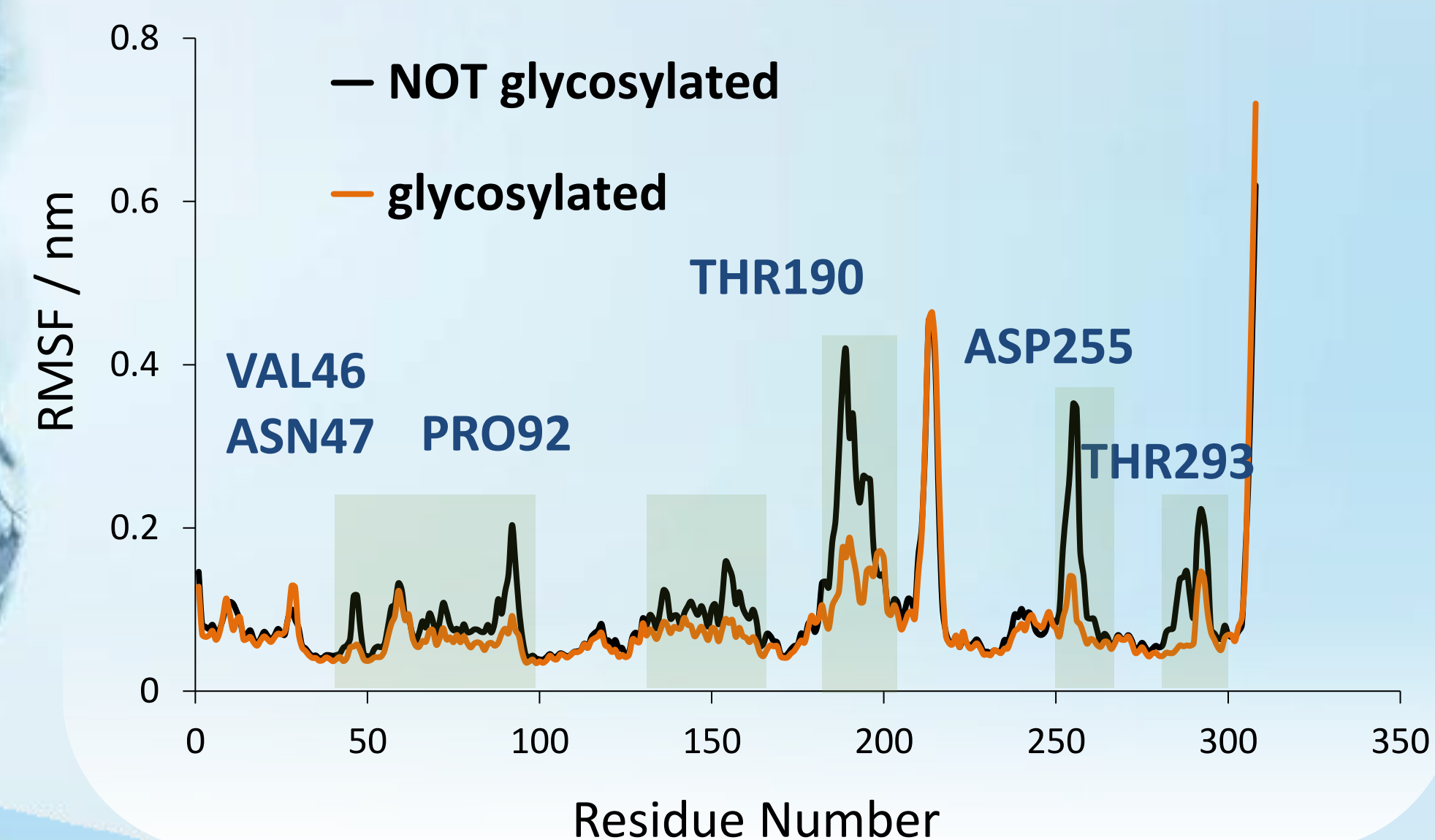


GLYCOSYLATION:

- 8 *N*-linked glycosylation sites
- different degree of *N*-glycosylation
- pattern: **ASN-X-THR/SER**



FLUCTUATIONS OF HRP

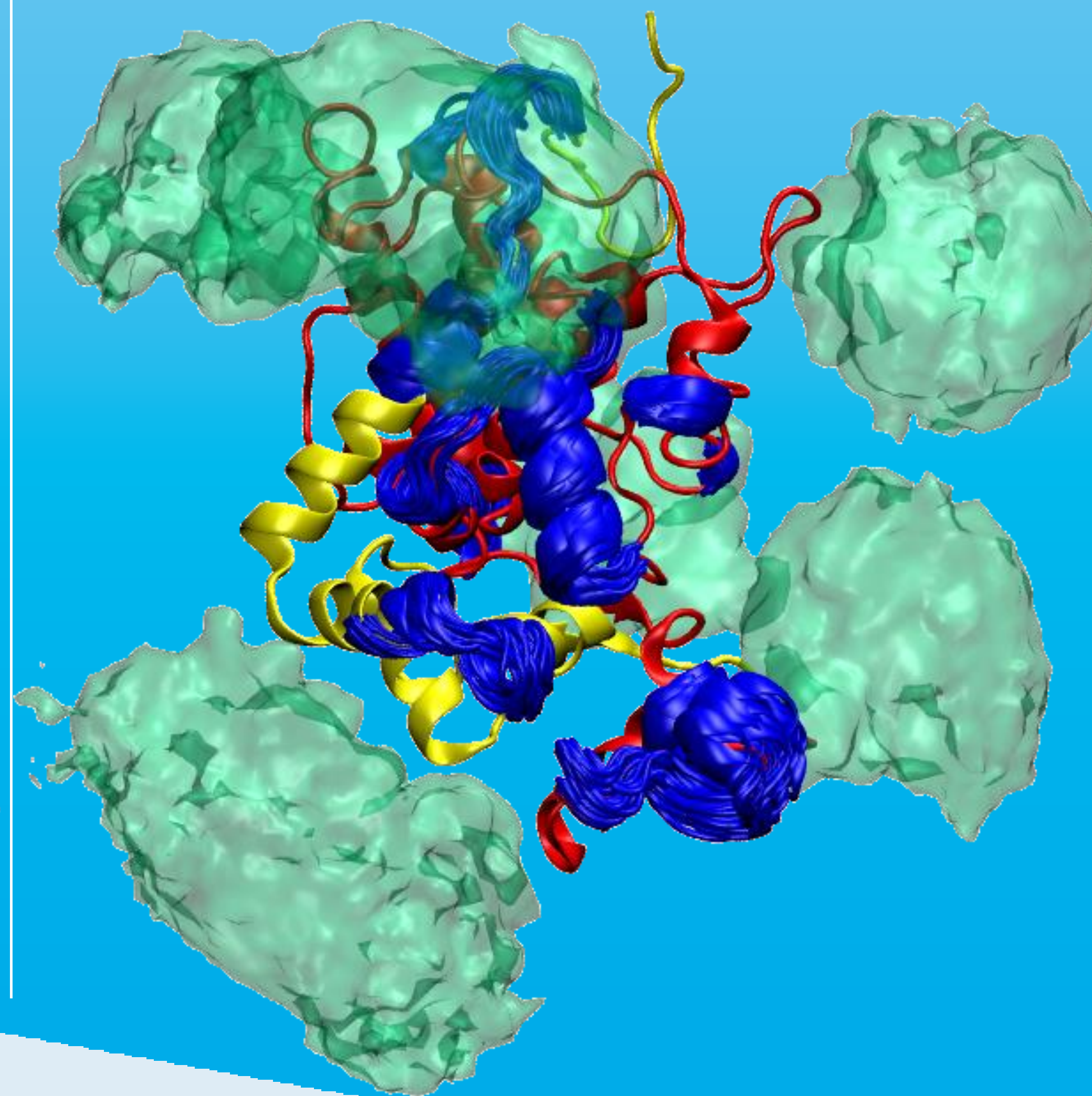
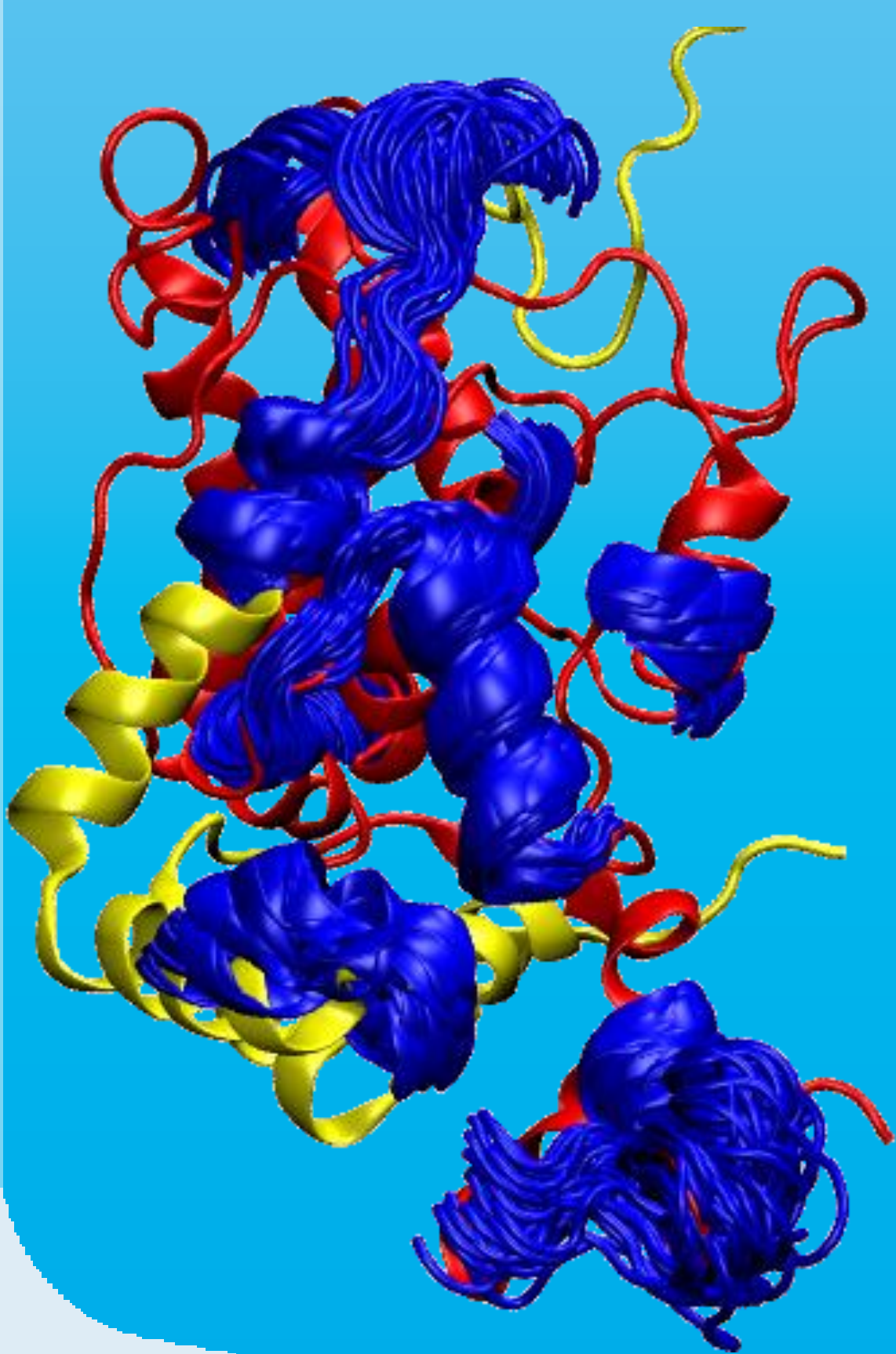


INFLUENCE OF N-GLYCOSYLATION

CONCLUSIONS

NO GLYCOSYLATION

GLYCOSYLATION



- **degree of glycosylation**
 - increase of glycan content decreases protein dynamics
 - minor differences in protein stability
- **global effect**
 - decrease in fluctuations – increase in protein stability
- **effect of glycosylation is not only localized at the glycosylation site – it can be propagated to other regions of the protein structure**
- **glycans protect specific parts of the protein surface – important feature in horseradish peroxide protein stability and its function**

LITERATURE:

- [1] J. D. Martell, M. Yamagata, T. J. Deerinck, S. Phan, C. G. Kwa, M. H. Ellisman, J. R. Sanes, and A. Y. Ting, *Nat. Biotechnol.* 2016, 34, 774–780.
 [2] F. W. Krainer, C. Gmeiner, L. Neutsch, M. Windwarder, R. Pletzenauer, C. Herwig, F. Altmann, A. Glieder, and O. Spadiut, *Sci Rep.* 2013, 3, 3279.
 [3] K. W. Moremen, M. Tiemeyer, and A. V. Nairn, *Nat. Rev. Mol. Cell Biol.* 2012, 13, 448–462.

@Marilia EU Project

@Marilia EU Project

@marilia_project

Marilia EU Project



#MARILIA

The MARILIA project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 952110.



www.mariliaproject.eu