Rapid Screening for Potential Epitopes Reactive with a Polycolonal Antibody by Solution-Phase H/D Exchange Monitored by FT-ICR Mass Spectrometry

Q.Zhang (FSU, Chemistry); K. Noble (FSU Biology); Y. Mao (FSU, Chemistry); N.L. Young, (NHMFL, Biochemistry); S.K. Sathe (FSU, Nutrition); K.H. Roux (FSU, Biology); A.G. Marshall (FSU, NHMFL, Chemistry)

Results and Discussion

The potential epitopes of a recombinant food allergen protein, cashew Ana o 2, reactive to polyclonal antibodies, were mapped by solution-phase amide backbone H/D exchange (HDX) coupled with Fourier transform ion cyclotron resonance mass spectrometry (FT-ICR MS). Ana o 2 polyclonal antibodies were purified in the serum from a goat immunized with cashew nut extract. Antibodies were incubated with recombinant Ana o 2 (rAna o 2) to form antigen:polyclonal antibody (Ag:pAb) complexes. Complexed and uncomplexed (free) rAna o 2 were then subjected to HDX-MS analysis. Four regions protected from H/D exchange upon pAb binding are identified as potential epitopes and mapped onto a homologous model (see Figure 1)

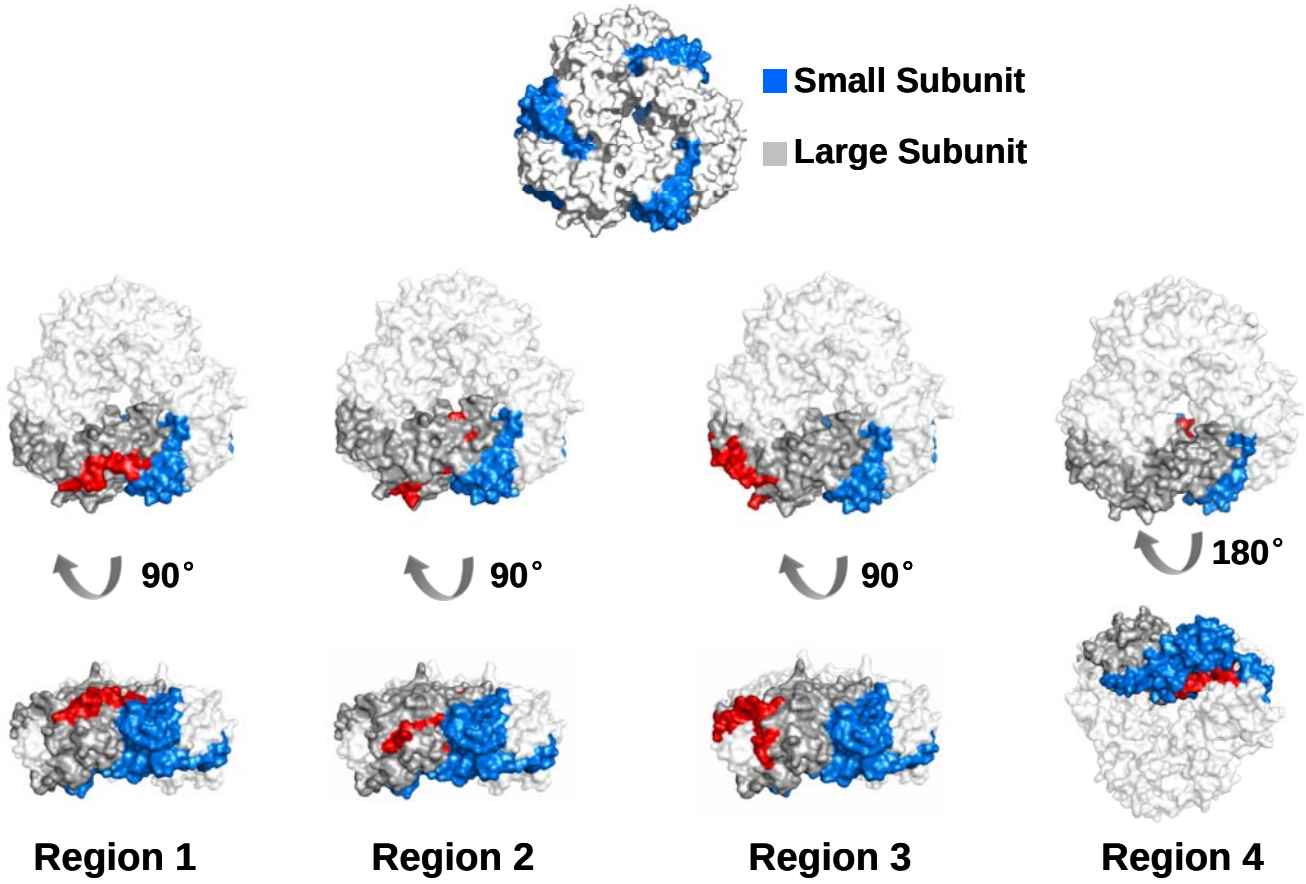

Figure 1. Four potential epitope regions mapped onto the X-ray structure generated by homology modeling (glycinin, pdb 1OD5).

Acknowledgments

This work was supported by NIH (R01 GM78359), NSF Division of Materials Research through DMR-06-54118, USDA NIFA-AFRI 2010-04213, the Almond Board of California, and the State of Florida.

References

[1] Zhang, Q.,et al., J. Am. Soc. Mass Spectrom., **24**, 1016-1025 (2013).