

Contribution of Disulfide Bonds and Calcium to Molluscan Hemocyanin Stability

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Z. Naturforsch. **59c**, 281–287 (2004); received November 19/December 18, 2003

Disulfide bonds and calcium ions contribute significantly to the stability of the hemocyanin from the mollusc *Rapana thomasiana* grosse (gastropod). An extremely powerful protective effect of Ca^{2+} at a concentration of 100 mM (100% protection) against the destructive effect of reductants like dithiothreitol was observed. This is important for the practical application of molluscan hemocyanins in experimental biochemistry, immunology and medicine. The reduction of the disulfide bonds in the *Rapana* hemocyanin leads to a 20% decrease of the α -helical structure. The S-S bonds contribute significantly to the free energy of stabilization in water increasing $\Delta G_{\text{D}^{\text{H}_2\text{O}}}$ by 6.9 kJ mol⁻¹. The data are related to the X-ray model of the *Rapana* hemocyanin functional unit RtH2e. The results of this study can be of common validity for related respiratory proteins because the cysteine residues are conserved in all sequences of molluscan hemocyanins published so far.

Key words: Hemocyanin, *Rapana thomasiana*, Disulfide