Judith Kornblatt

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Biochemistry

Research Interests

My research focuses on the relationship between the structure of enolase, and its catalytic activity. Most of my work has been done with yeast or mammalian enolases, which are dimeric. What is the relationship between the quaternary structure of the protein and its activity? What are the conformational changes that occur during catalysis? The protein is being perturbed by mutagenesis and by changing solution conditions (salts, hydrostatic and osmotic pressure). The effects of these perturbations are being monitored by a combination of kinetics, spectroscopic studies (uv, fluorescence and circular dichroism) and by analytical ultracentrifugation (quaternary structure). These experiments are being guided by the recognition that the precise conformation of the protein affects both subunit interactions and catalysis and that perturbing one often perturbs the other. This is especially true for many of the variant enolases that we have produced by site-directed mutagenesis. How does the active site communicate with the subunit interface? My group has recently begun to work on the enolase from streptococci. This enzyme is octomeric. How do its properties - catalytic activity, stability, etc - compare with those of the dimeric enolases? Can we convert the octomeric enolase into a dimeric enolase? If so, what happens to catalytic activity?

Please note that I am no longer accepting graduate students.

Selected Publications

M. J. Kornblatt, R. Lange, and C. Balny
Use of Hydrostatic Pressure to Produce "Native" Monomers of Yeast Enolase.
Eur. J. Biochemistry, 271, 3897-3904 (2004).

M. J. Kornblatt
Changing the Metal Ion Selectivity of Rabbit Muscle Enolase by Mutagenesis: Effects of the G37A and G41A Mutations.
Biochim. Biophys. Acta, 1748, 20-25 (2005)

S. Marchal, J. Torrent, P. Masson, M. J. Kornblatt, P. Tortora, P. Fusi, R. Lange and C. Balny
The Powerful High Pressure Tool for Protein Conformational Studies.
Brazilian J. Med. and Biol. Res., 38, 1175-1183 (2005).

S. Zhao, B. Choy and M. J. Kornblatt
Effects of the G376E and G157D Mutations on the Stability of Yeast Enolase: A Model for the Human Muscle Enolase Deficiency.
FEBS Journal, 275, 97-106 (2008).