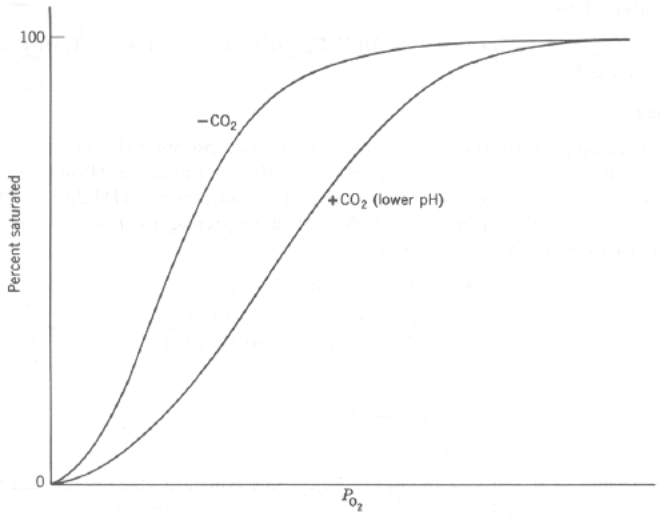
Problem Set #4
BMB 401 Spring 2003

Problems from Lehninger: 1, 2, 3, 4, 6, 7,

Problem 1 – Identify the distal and proximal histidines in hemolglobin / myoglobin, and summarize their roles in the respective protein's function.

Problem 2 – Explain from a structural standpoint why oxygen binding to hemoglobin shows cooperativity, while oxygen binding to myoglobin does not.

Problem 3 – The oxygen binding curve for hemoglobin is shown below. In the presence of CO_2, the partial pressure of O_2 required for any given fraction of saturation is increased. Suggest an explanation for this effect.



Problem 4 – Typical Hill plots are sigmoidal in nature, with the extreme ends showing slopes of 1, indicating no cooperativity. Explaing why this is the case.

Problem 5 – The slope of a Hill plot is 3.0 and the intercept on the ordinate is –0.6021. Calculate the Hill coefficient and the apparent dissociation constant.