

(Abstract)

**STRUCTURAL CHEMISTRY IN RELATION TO BIOLOGY AND MEDICINE**

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During the past thirty years the science of modern structural chemistry has been developed, until now there is available detailed structural information, about interatomic distances, bond angles, and even the distribution of electrons, for a great number of the simpler molecules and crystals. It has even become possible to apply this information to the complex systems that are involved in biology and medicine, and some progress is being made in the attack on the great problem of the relation between chemical structure and physiological and pharmacological activity. Even though there has not yet been determined the detailed structure of any protein molecule, significant progress has been made in understanding the structural basis of the specific biological forces that operate between antibodies and antigens. Moreover, the structural basis for the characteristic properties of hemoglobin, including its selective power of reversible combination with oxygen, has been elucidated, especially through the interpretation of the magnetic properties of hemoglobin and hemoglobin derivatives. This investigation of the properties of the hemoglobin molecule has led to the idea that the disease sickle cell anemia is a molecular disease - the hemoglobin of patients with sickle cell anemia is different in structure from normal hemoglobin, this difference in structure being responsible for the sickling of the red cells and the consequent symptoms of the disease.