Public Abstract

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Title: Structure of an Antigen-Binding Fragment Bound to Stem-Loop DNA and Crystallization of Recombinant *Haemophilus Influenzae* *e*(P4) Acid Phosphatase

Anti-DNA antibodies play important roles in the pathogenesis of autoimmune diseases and they also serve as unique models for the study of protein-DNA recognition. DNA-1 is an anti-ss DNA antibody derived from autoimmune lupus-prone mice. The first chapter of this thesis presents the 1.95 Å resolution structure of Fab DNA-1 complexed with a stem-loop DNA ligand. This structure shows that the two DNA strands dimerize to form a double-stranded DNA dumbbell and have a large conformational change upon protein binding. These results provide insights into the specific recognition model of anti-DNA Abs and the potential challenges in structure based drug design to treat autoimmune diseases.

Haemophilus influenzae infects the upper respiratory tract of humans and can cause infections of the middle ear, sinuses, and bronchi. Lipoprotein *e* (P4), which is a class C acid phosphatase, is a potential vaccine candidate for nontypeable *H. influenzae* infections. The second chapter of this thesis reports purification, crystallization of recombinant *e* (P4), and acquisition of a 1.7 Å resolution native X-ray diffraction data set. This is the first report of crystallization of a class C acid phosphatase.