

Crystal structure of major cat allergen Fel d 1.

Tatyana Sandalova², Liselotte Kaiser¹, Hans Grönlund¹, Hans-Gustaf Ljunggren³,
Marianne van Hage-Hamsten¹, Adnane Achour³ and Gunter Schneider²

¹ Department of Medicine, Unit of Clinical Immunology and Allergy, Karolinska Institutet and Hospital L2:04, S-171 76 Stockholm, Sweden

² Department of Medical Biochemistry and Biophysics, Karolinska Institutet, Scheelev 2, S-171 77 Stockholm, Sweden

³ Center for Infectious Medicine, F59, Department of Medicine, Karolinska Institutet, Huddinge University Hospital, S-141 86 Stockholm, Sweden

The domestic cat (*Felis domesticus*) is an important cause of allergic asthma worldwide. The crystal structure of the major cat allergen Fel d 1 has been determined to a resolution of 1.85 Å using seleno-methionine substituted protein. The fold of Fel d 1 presents a striking resemblance to uteroglobin, a steroid-inducible cytokine-like molecule with anti-inflammatory and immunomodulatory properties, providing a possible explanation for the allergenicity of Fel d 1. An internal pocket is present within both structures, but the shape of the cavity as well as the properties of the Fel d 1 residues lining the cavity indicate a different kind of ligand than those proposed for uteroglobin. Residual electron density within the cavity indicates the presence of an unknown ligand. A comparison of the structures of Fel d 1, oxidized and reduced uteroglobin suggests that the Fel d 1 ligands use a similar path to enter the cavity. Three previously defined IgE epitopes map on the surface of Fel d 1.