

# **Protein Secondary Structure Analysis of Chicken Feathers Structures using Attenuated Totally Reflection Fourier Transform Infrared Spectroscopy**

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Avian feathers can be classified by morphological types, growth positions, and biological functions and which morphological diversity is based on shape types and textures from different feathers of positions. Protein structure of feather is suggested correlating with physical properties and morphology of feathers; furthermore, the componential profile of protein secondary structures (PSSs) of feather would be utilized for differentiating the function of feathers of different avian. However, the correlation between PSSs and morphological type is rarely understood. Herein attenuated total reflectance was coupled with Fourier transform infrared spectroscopy (ATR-FTIR) to investigate protein secondary structures from different types feathers of domestic chickens (*Gallus gallus domesticus*). Chicken feathers were collected from National Chung Hsing University. The ATR-FTIR spectral result of chicken feathers elucidated that the characteristic absorption of amide I and amide II respectively in flight-outer vane, flight-inner vane, contour-normal pennaceous portion, and contour plumulaceous. Based on our findings, PSSs were strongly correlated with physical structures, shape types, and textures of feathers and PSSs profile can be applied to discriminate structural mutations of feathers.