

# 枯草菌HemAT蛋白质结合配基O<sub>2</sub>的构象变化--紫外共振拉曼光谱研究

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枯草菌HemAT蛋白质是新近发现的一种基于血红素的趋氧性同型二聚体蛋白质。作者对此蛋白质进行了表达和提纯。用紫外共振拉曼光谱研究了全分子和传感域HemAT在与配基O<sub>2</sub>结合时的构象变化。发现O<sub>2</sub>配基与HemAT蛋白质的结合使传感域中Trp和Tyr的环境发生变化,而对连接域中Tyr的环境影响可忽略不计。信号发送域对O<sub>2</sub>配基引起的Trp和Tyr的环境变化不产生影响。O<sub>2</sub>配基与HemAT蛋白质的结合使得G-螺旋发生位移,传感域与信号发送域通过某种互感方式把O<sub>2</sub>结合信号从传感域传递到信号发送域。

## Conformational Changes of HemAT Protein from *Bacillus subtilis* upon O<sub>2</sub> Binding Studied by UVRR

HemAT protein from *Bacillus subtilis* is a newly discovered heme-based aerotactic homodimer protein. Full-length and truncated sensor domain HemAT samples for experiment were expressed and purified. Their conformational changes upon O<sub>2</sub> ligand binding have been studied by ultraviolet resonance Raman spectroscopy. It is found that O<sub>2</sub> binding to the heme of HemAT changes the environment of the Trp and Tyr in the sensor domain but hardly changes the environment of the Tyr in the linker region between the sensor domain and the signaling domain. In addition, the signaling domain does not affect the Trp and Tyr residues environments upon O<sub>2</sub> binding. G-helix experiences displacement in going from unliganded to O<sub>2</sub> ligand form. It is suggested that the conformational changes that occur in the sensor domain upon O<sub>2</sub> binding be propagated to the signaling domain through interactions between sensor and signaling domains.

### 关键词

枯草菌(*Bacillus subtilis*); HemAT; 蛋白质(Protein); 紫外共振拉曼(UVRR)