香港中文大學
院士講座系列

# The 12th Lecture Series by Academicians from the Chinese Academy of Sciences (CAS)

Jointly Organized by
School of Life Sciences
Office of Academic Links (China)


**Speaker:** **Prof. CHONG Kang**
Division of Life Sciences and Medical Sciences
Chinese Academy of Sciences
**中國科學院生命科學和醫學學部種康院士**


**Title:** **The Mechanism and Application Potential of Plant Sensing to Cold**

**Date:** Wednesday, 23 January 2019

**Time:** 15:30-17:45

**Venue:** Science Centre LT1

**Registration**: http://www.cuhk.edu.hk/oalc/cas_2019/

## 簡歷

植物生理學家。中國科學院植物研究所研究員。1962 年 4 月生於陝西省合陽縣，籍貫陝西合陽。1984 年畢業於蘭州大學生物系獲學士學位，1988 和 1993 年分別獲該校碩士和博士學位。現任中國科學院植物研究所黨委書記、副所長。2017 年當選為中國科學院院士。主要從事植物感知溫度以及開花和器官發生的分子網路研究，在小麥春化作用和水稻寒害信號感知機制以及激素互作網路等方面有重要的創新性貢獻。發現小麥感知春化信號的分子網路，揭示了春化蛋白磷酸化和糖基化修飾的感知機制與開花調控模式。發現水稻低溫感受器，揭示了細胞膜蛋白複合物感受低溫機制與信號轉導途徑，證明在人工馴化中基因介導的耐寒性起源於中國野生稻的分子遺傳變異模式。闡明瞭獨腳金內酯和甾醇類激素等調控水稻側芽分化及葉傾角形成的分子細胞新機制。

## The Mechanism and Application Potential of Plant Sensing to Cold

Environmental factors such as low temperature directly affect crops production. Therefore, the mechanism underlying the adaptation to low temperature is of great significance to provide the basis of theory in guidingfarming practices.Thusdissecting the mechanism of perception of low temperatureand counting dosage of low temperature is the key issue to solve this scientific problem. We have isolated a major QTL COLD1 to enhance chilling tolerance in rice, which is the key gene to sensing low temperature. COLD1 encodes a regulator of G-protein signaling and it interacts with the G-protein $\alpha$ subunit RGA1 to sense cold to activate the Ca2+ channel for active defense system.Based on the genomic analysis of 112 accessions of rice, we found that the chilling-tolerant allele originated from the Chinese O. rufipogon populations and was subject to strong human selection during japonica domestication. We also found that the rice MADS-box transcription factor OsMADS57 cooperating with its interaction protein OsTB1 regulated the cold tolerance in rice, which has the molecular switching characteristic to balance organogenesis and defense responses. We also elucidated the mechanism ofthe interaction between vernalization response protein VER2 and RNA binding protein TaGRP2 in regulatingwheat vernalization. The crosstalk between phosphorylation modification and O-GlcNAcylation modification regulated the interaction of VER2 and TaGRP2 andmodulated the transcription of keyvernalization response genes affecting flowering in winter wheat. The above researches provide important theoretical basis and targets of action for the molecular design and breeding of crop varieties.

**Language:** Putonghua/English

ALL ARE WELCOME
Enquiries: 394-33002 / 38727