

# Potato Laboratory of Huazhong Agricultural University

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## The Potato Laboratory of Huazhong Agricultural University

is an active part of the National Center for Vegetable improvement (Central China) and the Key Laboratory of Horticultural Plant Biology (Huazhong Agricultural University), Ministry of Education and a base of the Potato Engineering and Technology Research Center of Hubei Province established in 2003. Having the tenet of “Rigorous, Truth, Cooperative and Creative”, a group leading by Professors Xie Conghua and Liu Jun and consisting of middle-young-age staff has been formed

and developed along with addressing key issues of science and technology in agriculture development by the strategy of serving the national targets, approaching the scientific foreland and basing upon the industry reality.

The laboratory has focused on innovating and applying new germplasm through cell engineering and population improvement, identifying important genes governing resistance and tuber quality via functional genomics, establishing novel seed tuber/root propagation system upon research on developmental mechanism of the modified organisms, and serving the potato industry in virtue of breeding for new varieties. There are 14 research projects supported by programmes of NSFC, 863, 948, etc. In past 5 years, more than 70 papers published including 10 published in SCI indexed journals, 3 research achievement awards obtained including The First Award for Innovation of Hubei Province and 2 state innovation patents was conferred.

## Functional Genomics of Resistance to Potato Late Blight

### I. Identifying and profiling of *P. infestans* induced genes in potato

To elucidate the molecular events of potato quantitative resistance to *Phytophthora infestans*, we carried out a comprehensive transcriptional analysis using cDNA microarrays containing 1009 ESTs from a SSH. A total of 348 *P. infestans* responsive genes were identified. Based on the general expression patterns of these genes at different time points, we discriminated distinct stages of potato defense against *P. infestans* and revealed genes participating in each stage. To further understand the dynamics of *P. infestans*-induced gene expression, hierarchical clustering was used to illustrate their various expression profiles during the time course, including early, mid and late gene induction as well as early gene repression. Interestingly, some genes involved in the hypersensitive response were also identified, suggesting that a same or similar defense system may exist in both race-specific and race-nonspecific resistances.

