



位置: 首页 > 研究队伍



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张相岐博士领导的创新研究组主要研究方向是麦类重要基因的标记、克隆及功能研究和分子染色体工程及育种。主要研究内容:

1. 麦类重要基因的标记、克隆及其功能验证

研究组主要针对小麦及其近缘属种品质和抗病抗逆性状, 开展相关基因定位、分子标记与克隆, 重要功能基因表达调控及其在性状形成中的作用等方面的研究。发现和标了YrQz、YrT32等新的抗条锈病基因, 并已用于分子标记辅助育种。分离了一批控制重要性状的功能基因, 主要包括: 与抗病相关的受体样蛋白基因TaRLK、Mla-like基因和转氨酶蛋白基因Hsp90等; 与抗逆相关的TaALDH家族基因、水通道蛋白基因和醛脱氢酶基因等; 与品质相关的高分子量和低分子量麦谷蛋白基因等。近年来又开展了小麦全基因组片段渗入系的创制工作。本领域的研究得到国家“973”计划、“863”计划和转基因重大专项项目的资助。

2. 小麦分子染色体工程及遗传育种

创新研究组在该领域的研究主要集中在外源染色体或染色体片段向小麦的转移及遗传重组、杀配子基因和Y射线等遗传和物理因素在麦类染色体操作中的应用及分子育种等方面。一方面利用染色体工程材料探讨一些遗传学基础理论问题, 同时也为小麦品种改良提供优异的种质材料。采用染色体工程方法创造了一大批带有外源遗传物质的非整倍体材料, 包括附加系、代换系和易位系。研究成果曾获两项国家自然科学基金。近年来, 又开展了小麦全基因组片段渗入系的创制工作, 已获得了覆盖受体小麦品种全基因组的亚种段渗入系群体。遗传育种方面, 采用染色体工程、分子标记辅助选择等技术, 并结合常规育种方法选育了5个小麦新品种和一批优质、抗病新品系。本领域的研究得到国家“863”计划、支撑计划、转基因重大专项和中国科学院重要方向项目的资助。

KEY PUBLICATIONS

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