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Research Area: **BIO** **Duration of Award: 1 Year**

Project Title: Genetic Analysis & Mapping of Major FHB Resistance QTLs in the Japanese Cultivar Tokai 66.

PROJECT 1 ABSTRACT
(1 Page Limit)

Sumai 3 is currently the main FHB resource used in USA and the world for breeding wheat variety with better FHB resistance. Broadening our FHB resistance sources will not only strengthen our ability to control FHB epidemics but also reduce risk of the potential disaster caused by a sudden lose of Sumai 3 derived FHB resistance. Multi-year evaluation at SDSU has revealed that a Japanese cultivar Tokai 66 has stable low FHB index and low fusarium damaged kernels. SSR marker analyses also showed that Tokai 66 is distant from Sumai 3 for four out of the five SSR markers near the *Qfhs.ndsu-3BS* QTL and in the genetic background. The goal of this project to confirm the novelty of the FHB resistance found in Tokai 66 and develop SSR markers for the resistance QTLs. We will approach our goal by genetically analyzing the FHB resistance of Tokai 66 with the aid of SSR markers to determine the number of FHB resistant QTLs its may have, and compare these QTLs to their homologues in Sumai 3. Our objectives for FY2004 are: 1) creating mapping population between Tokai 66 and Y1193-6 (a FHB-susceptible landrace); 2) discovering polymorphic SSR markers between the parents; and 3) initiating genetic analysis. Novel resistance genes are the foundation for breeding wheat cultivars with better FHB resistance. Identifying the novelty of the newly selected FHB resistance sources is needed to avoid unnecessary efforts of incorporating duplicated FHB resistance genes into varieties. Genetically analyzing and mapping resistance QTLs are the technical route we'd like to take. By doing so, we will be able to quickly confirm the novelty of the FHB resistance of Tokai 66, find out the number, the genomic locations and develop SSR markers for the identified major resistance QTLs. Therefore, this project will help realize the USWBSI's goal of "To develop as quickly as possible effective control measures that minimize the threat of Fusarium head blight (scab) to the producers, processors, and consumers of wheat and barley" through achieving the following goals set for the Biotechnology research area: "Map new and/or novel sources of resistance genes in wheat and barley germplasms" and the following USWBSI's goal set for the Germplasm Introduction and Enhancement research area: "Genetic analyses of newly identified and/or acquired sources of resistance".