DEVELOPMENT OF A PLANT PROTEIN PHOSPHORYLATION DATABASE AND A WEB-BASED PROTEIN PHOSPHORYLATION PREDICTION TOOL

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ABSTRACT

In this project, two efficient and intuitive user-interfaces were designed and developed to be highly accessible and versatile for bioinformatics researchers. Two web based user interfaces were designed for two bioinformatics tools, Plant Protein Phosphorylation Database (P^3DB) and Musite.net. These tools were developed primarily for protein phosphorylation research.

P^3DB is a web interface to a database containing only information on plant protein phosphorylation. The web interface of P^3DB was redesigned from a previous version to provide a significantly better user experience and additional features. This was done using dynamic web coding techniques and a more modular template file structure.

Musite.net is a web-based version of a protein phosphorylation prediction tool and has been expanded to allow predictions of other posttranslational modifications. Musite.net implements the main features of its desktop counterpart as well as some unique features. Musite.net is extremely dynamic in order to function similarly to a desktop application. Musite.net was made very accessible by implementing uniform resource locator (URL) submissions and an application programming interface (API).

Dynamic web coding allowed several user tasks to be simplified. Additionally, some features were implemented that would have otherwise been impossible with a static webpage. A template file structure allows future maintenance and development to be simplified compared to a less modular system.