A Laboratory Information Management System for Protein Complex Research

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http://www.csm.ornl.gov/Internships/rams_05/abstracts/t_rand.pdf

Introduction

In conjunction with the Department of Energy, the Oak Ridge National Laboratory has begun a Genomics: GTL Center for Molecular and Cellular Systems. This program was designed to define the many protein complexes of a cell. To establish a better researching environment the CMCS uses a Laboratory Information Management System (LIMS). The LIMS will be used to create a clone stock inventory system. This system will assist researchers in project planning, data security as well as quality assurance.

Tools Used

- Database Designer

- Oracle Database

- Infomaker

- Perl Scripts

- Laboratory Information Management System (LIMS)

Methodology

The database designer was used to link the required database tables together. A graphical interface allowed the specific fields needed to be chosen and easily visible. Once the fields were known the SQL code was written. The SQL queries were written and tested in an Oracle database. The created queries were then integrated into InfoMaker. InfoMaker is a program that generates reports from within a database. The report created with InfoMaker is accessible from within the LIMS that the CMCS uses. Finally the same query is used in a Perl program. Perl is a programming language that allows access to and from a database system. The Perl program was used to access the database created and output a report to the Web.

Research Goals

- Develop a clone stock inventory system using LIMS to provide for better project planning

- Improve operational efficiency and quality assurance

- Maintain a detailed record of each sample used

- Accessible from Web as well as from within LIMS

Results

The results of this research will prove to be beneficial in many ways. It will allow researchers to know exactly where to go when looking for a specific sample and know which clones are available for protein complex experiments. It will also allow the lab staff to efficiently schedule production of new clones. This simple yet important tool can make the difference between a one week experiment and a two week experiment. When combined together the tools used were helpful in creating a very useful Clone Stock Inventory System. The system will be used by the many researchers participating in the CMCS project at ORNL. The final project allows for a user to search for a specific sample by its gene name or by its location.

Summary

The clone stock inventory system created will allow for a more organized and better flow of work for the researchers at ORNL involved with the GTL program. It was created using data modeling, Perl programming, and customization of reports. It is also accessible from the web as well as from within the LIMS. The clone system will effectively create a smoother operation for the GTL: Center for Molecular and Cellular Systems at ORNL.