The Indiana Clinical and Translational Sciences Institute HUB

William K. Barnett, Ph.D
Indiana CTSI, Indiana University School of Medicine
Indianapolis, IN

e-mail: barnettw@iu.edu

Abstract—The Indiana CTSI HUB is a medical virtual organization online portal for the Indiana Clinical and Translational Sciences Institute (CTSI) that will support the full medical research and healthcare delivery cycle as part of the National Institutes of Health (NIH) Clinical and Translational Science Awards (CTSA) to Indiana University and Purdue University. The HUB is built on the Purdue HUBzero platform, using Joomla and other standards-based Web 2.0 tools. Although the program is only 7 months old, the HUB already delivers internal grant proposal management, integrated search of research resources, online education and training, clinical trials information, user contributed and tagged content, content ranking, and a platform for creating and sharing simulations, and access to data repositories and high performance computing resources.

Virtual Organizations, Web 2.0, Clinical Translational Science, Joomla, HUBzero, collaboration, tagging.

I. INTRODUCTION

The Indiana CTSI HUB (www.indianactsi.org) is a medical research virtual organization online portal for the Indiana Clinical and Translational Sciences Institute (CTSI) at the Indiana University School of Medicine. It is a statewide resource designed to support the full medical research and healthcare delivery cycle as part of a National Institutes of Health (NIH) Clinical and Translational Science Awards (CTSA) to Indiana University and Purdue University. The portal is built on the Purdue HUBzero platform, using Joomla and other standards-based Web 2.0 tools. Although the program is only 7 months old, the Indiana CTSI HUB already delivers internal grant management, integrated search of research resources, online education and training, clinical trials information, user contributed and tagged content, content ranking, and a platform for simulations and access to data repositories and high performance computing resources.

II. BACKGROUND

The NIH created the CTSA program to transform how clinical and translational research is conducted, ultimately enabling researchers to provide new treatments more efficiently and quickly to patients as part of the NIH Roadmap for Medical Research.

Indiana University and Purdue University have jointly received a CTSA award to create the Indiana Clinical and Translational Sciences Institute (Indiana CTSI) with the mission to “increase translational research to improve the health (and economy) of the Indiana population” with the following five overarching goals:

1. Create Translational Research Acceleration Programs and Support Pilot Projects,
2. Train a new cadre of Translational Researchers,
3. Foster Robust Community Engagement,
4. Build Facile and Comprehensive Research Resources and Technologies, and
5. Leverage the Resources of the Greater Indiana Community.

The Indiana CTSI translational circle is designed to support Basic Research (pre-clinical and animal studies), Clinical Research (Phase III and efficacy studies), Translation Into Practice (TRIP – Care acceptance and health economics), Practice-Based Research (Phase IV and best practice studies), and Product Development (Licensing, Industry partnerships, and IP management). It aspires to assist the following translations: Case series Phase I and II studies; Disease modeling, -Omics studies, and Pharmacogenetics; Dissemination and Implementation Research; and Meta-analyses and Systematic Reviews. [1]

III. THE INDIANA CTSI HUB

The Indiana CTSI HUB is designed as the central informatics resource to fully enable the above goals and activities for researchers, industry, and the public. It aspires to be the collaborative and management tool for translational activities and to provide the following services:

- A central, authoritative repository of information about programs, researchers, industry partners, opportunities, and events.
- A site for intra- and inter-institutional collaboration.
- Educational and public outreach tools and community support.
- Searchable researcher expertise, research project, and other 'wiki-type' knowledge databases with appropriate search engine tools.
- A system for confidential submission, review, funding of internal grant applications.
- Web tools for accessing, ordering and paying for core laboratory analytical services.
Web-tools for hosting and deploying novel biomedical informatics translational research tools and datasets

To date, the Indiana CTSI HUB has delivered the following services:

- A system for online management of internal grant proposals that supports submission, collaborative review, automated notification, and reporting. This system is based on the Open Journal Systems software (http://pkp.sfu.ca/ojs/).
- An integrative search feature that is focused on search of a faculty publications database as well as locally contributed PubMed records, clinical trials information, and HUB contributions. This will soon be augmented with researcher profiles to ease discovery of potential collaborators.
- Clinical trials information for patient recruitment.
- Online education and training tools, including for the protection of human subjects in research certification.
- An institutional calendar for event posting, and
- A system for contribution tagging, rating, and annotation.

The next development steps for the Indiana CTSI HUB include:

- Expansion of integrated searching to additional data sets, including library holdings and the Indiana Database of University Research Expertise (INDURE).
- InCommon Federation authentication of users to lower the barriers to broader collaboration.
- Automated analytical service pipelines through Medical School and Purdue University Cores.
- Community outreach portal through the Community Health Engagement Program (CHEP).
- Semantic Web resource tagging for more automated discovery and recommendation.

IV. INDIANA CTSI HUB TECHNOLOGY

The CTSI HUB is based on the HUBzero virtual organization platform developed by Purdue University and implemented, most famously through NanoHUB, which currently has over 70,000 users worldwide. A "hub" is a web site built with many familiar open source packages—a Linux system running an Apache web server with LDAP for user logins, PHP web scripting, Joomla content management system, and a MySQL database for storing content and usage statistics. The HUBzero software builds upon that infrastructure to create an environment in which researchers, educators, and students can access tools and share information (see http://hubzero.org). Specifically, a "hub" is a web-based collaboration environment with the following features:

- web-based support for developing, publishing, organizing and delivering simulation and modeling tools and supporting resources
- user generated tags, ratings, citations, wikis, blogs, events,
- User Groups for private collaboration
- a tool development framework for simulations, workflows, and grid/HPC access
- HUBs are based on a standards based technology platform that uses the LAMP architecture, eg., Apache, MySQL, Joomla, and RAPPTURE for simulations authoring.

ACKNOWLEDGMENT

The author is grateful for the assistance of Mike McLennan of Purdue University and Sean Mooney of the Indiana University School of Medicine for assistance and insight, however, all errors and omissions are the authors.

REFERENCES