ISU Selected as a National Resource for Agricultural Genomics

Iowa State University researchers have a long history of gathering genomic information, organizing it and making it available to other scientists. This tradition of scientific excellence and sharing is a major reason the university was chosen by the US Department of Agriculture (USDA) to lead database coordination for the National Genetics Resource Program.

James Reecy of Iowa State University has been named the USDA’s US Bioinformatics Coordinator. He oversees the website that houses the six animal genome databases that are supported by the USDA’s National Research Sponsored Program 8 (NRSP-8). The databases are located online at http://www.genome.iastate.edu/. The site includes genome databases for aquaculture, chicken, sheep, pigs, horses and cattle. The site has tools and tutorials for gene sequence and quantitative trait loci (QTL) studies.

"ISU already had a history of creating and maintaining databases because of Max Rothschild’s pioneering work in swine. We already hosted the cattle, pig and chicken databases at ISU, so it was a logical choice for the USDA to select ISU to host the additional databases," says Reecy.

A full time programmer administers the site, constantly making updates. Early feedback indicated that researchers found the site useful, but they were interested in working with more sequences simultaneously. The site already has been expanded to fill that request.

"One of the best attributes of the databases is that the information is entirely independent. Researchers from around the world are adding information to the database and, in turn, using it in their work," Reecy says. “An unexpected benefit of the online databases has been that researchers in developing countries are able to access this information for the first time.”

Key university partners with ISU in this effort include Auburn (aquaculture), Texas A&M (cattle), Kentucky (horse), Michigan State (chicken), and Utah State (sheep).

As a further result of ISU’s excellence and experience with genome database technology, the USDA chose the university to house the Plant Germplasm and Information Management Unit of the Agricultural Research Service. Four new USDA positions will be filled in the next six to nine months, with appointments in agronomy and plant pathology.

The Maize (Corn) Genetics and Genomics Database (MaizeGDB located at http://www.maizegdb.org and housed at ISU) is one of the oldest genetic databases in the world. Ed Coe, with the USDA-ARS and the University of Missouri at Columbia, was the editor of the maize newsletter during the early 1990’s. He also was responsible for creating a database containing the information from the newsletters. In their time, the database and its web interface were cutting edge technology, but they eventually became outdated. The original database was sent to ISU in the hope that Volker Brendel’s team of biologists and computer scientists could bring the database and web interface up-to-date. Under Brendel’s direction, a team including Trent Seigfried and Darwin Campbell made MaizeGDB the successful and useful resource that it is today.
Carolyn Lawrence is the current lead scientist on the MaizeG-DB project. “The database we have today is the result of a community of maize geneticists working together over decades. It is a composite of everybody’s work, rather than that of a single group.”

There are many plant databases developing independently at ISU. BarleyBase is a plant microarray data resource that supports 11 plant microarray platforms. BarleyBase houses gene expression data along with experiment information. The database is led by Julie Dickerson and Roger Wise and located online at http://www.barleybase.org/.

SoyBase is the central repository for data about soybean genetics, genomics, pathology and almost all other research topics concerning soybean. The genetic maps are the central organizing theme of the database, with the rest of the data organized by subject. The SoyBase project is led by Randy Shoemaker and is located online at http://www.soybase.org/.

PlantGDB, led by Brendel and managed by staff scientist Qunfeng Dong, is located at http://www.plantgdb.org. PlantGDB is an NSF-funded project to develop plant species-specific databases, to provide web-accessible tools and interspecies query capabilities and to provide genome browsing and annotation capabilities.

The ARS Plant Germplasm and Information Management Unit of the USDA-ARS will bring these and other plant databases together in one center. Central organization through the Plant Germplasm and Information Unit will allow researchers, hardware specialists and programmers to learn database techniques from each other to more efficiently improve and advance the databases.

**Biotechnology News**

**New Website Resource for ISU-Industry Partnerships**

Iowa State University has a wealth of resources to help biotechnology businesses through all phases of development. The university offers, among others, business and technical assistance, business incubators and physical space, instrumentation and service facilities and a research park. Now, information for all of these services is found in one place – the Industry Relations website, online at www.industry.iastate.edu.

The site is the result of a six-month project by the Industry Coordination Effort (ICE). The focus of the site is to provide access to all of the university’s business resources in one user-friendly interface. Each of the Systems for Innovation links on the left side of the page has a facilitator who can be contacted for further information.

There are links for R & D agreements, strategic partnering, philanthropy, research, faculty and staff expertise, success stories, events, newsletters, tip sheets, recruitment and more.

**Iowa State Agricultural Research Among Most Cited Worldwide**

Based on a news release by Ed Adcock, ISU Agriculture Communications

Over the past decade, Iowa State University was the 10th most-cited institution in the world in agricultural sciences, according to In-Cites, a web site that tracks the use of scientific information that is mentioned in research papers worldwide.

From January 1, 1994, to June 30, 2004, Iowa State ranked 10th among all institutions and fifth among the world’s universities. Among American universities, ISU ranked fourth, preceded by the University of California-Davis, the University of Wisconsin and Cornell University. According to In-Cites, scientists cited 1,196 agricultural science papers created at Iowa State 8,340 times over the decade.

“The fact that researchers are citing Iowa State agricultural research results to such a degree speaks volumes on the quality of our science and that it is in areas of vital concern,” said Catherine Woteki, dean of the College of Agriculture and director of the Iowa Agriculture and Home Economics Experiment Station. The Experiment Station administers faculty research programs that support Iowa’s agriculture, natural resources, family and consumer programs at Iowa State.

In-Cites is an editorial component of Essential Science Indicators, a web resource that helps researchers analyze research and track trends in science worldwide. The top 20 institutions listed were chosen from among 298 government agencies and universities. The report can be found at: http://in-cites.com/institutions/agr_1994-2004.htm

**Upcoming Events**

May 18 — Biotech Mixer
11:00 a.m. - 4:30 p.m. HNI Corporation, Muscatine
Registration information available at www.industry.iastate.edu/biotechmixer/biotechmixerVIII.html

July 13 — Economic Development Open House
9:00 a.m. - 3:30 p.m. Iowa State University. For more information contact Lora Bierbaum, lora@iastate.edu
**Research in Biotechnology 2005 Available Online**

The Iowa State University Research in Biotechnology 2005 is available online at www.biotech.iastate.edu/Current_Research/tablecontents.html. The site contains a description of the research interests of ISU biotechnology faculty and the researchers’ contact information. In addition, the site provides comprehensive information on services and facilities available on campus. To receive free printed copies of the document, send your mailing address to the Office of Biotechnology at biotech@iastate.edu.

**Weekly Seminar Information by Email**

The Office of Biotechnology prepares and distributes a weekly email list of biotechnology-related seminars. If you are interested in receiving this information, please send an email with a request to be added to the biotechnology seminars list to camstock@iastate.edu.

**Available Technologies**

Iowa State University is seeking industrial partners to develop and/or commercialize the following technologies. For more information and for a complete listing of all available technologies, contact the Office of Intellectual Property and Technology Transfer at 515-294-3893 or www.techtransfer.iastate.edu.

**Soybean Protein Fractionation Process to Isolate 7S-rich (Beta-conglycinin-rich) and 11S-rich (glycinin-rich) Proteins**

Researchers have developed a new, straightforward and repeatable process to obtain 7S-rich (Beta-conglycinin-rich) and 11S-rich (glycinin-rich) proteins isolated from soybeans. These proteins have unique functional and nutritional applications for the food industry. The process provides significantly better protein yields than existing processes. Further, it allows for production of different proportions of the 7S-rich and 11S-rich globulins each with unique compositions and functions. Final purities of both protein fractions are equivalent to or better than any existing processes. The process is reproducible and can be executed with existing equipment. Applications include nutraceuticals, low carbohydrate foods, functional foods, and ingredients to improve the health profile of less-healthy foods. ISURF #3142

**Faces and Places**

**Clark Coffman**, assistant professor of genetics, development and cell biology, received his Ph.D. from the University of California at San Diego. For his graduate research, he analyzed the control of cell fate decisions during amphibian embryogenesis, such as muscle cells vs. cells of the nervous system. He then took a post-doctoral position at the University of Colorado at Boulder where he began his current research examining regulation of cell migration and programmed cell death during development.

Migrating cells help shape the embryo, form the nervous and vascular systems and establish the germ line. Cells must migrate correctly or they will be eliminated via programmed cell death because misplaced cells pose a threat to the organism. Coffman’s lab investigates the mechanisms regulating cell migration and programmed cell death using the germ cells of *Drosophila melanogaster* as a model. Elucidating the regulatory mechanisms governing these fundamental developmental events will increase our understanding of the etiology of metastasis, congenital heart disease, autoimmune disease and neurological disorders. The lab is currently funded by an external grant from the National Science Foundation. Coffman can be reached by phone at 515-294-3911, by email at ccoffman@iastate.edu, or at his office in 3258 Molecular Biology, Ames, IA 50011.

**Diane Moody**, assistant professor in the department of animal science, comes to Iowa State University from a faculty position at Purdue University, West Lafayette, IN. Her research at Purdue focused on understanding the genetic regulation of osteoporosis in chickens and investigating the function of a novel gene involved in muscle growth. Prior to her tenure at Purdue, Moody completed a Ph.D. at the University of Nebraska in 1998, followed by a post-doctoral fellowship with Elanco Animal Health.

Moody’s current work at ISU focuses on the genetic improvement of dairy cattle. She is interested in changes in energy partitioning that have resulted from long-term selection for milk production in dairy cows. Her program will utilize genomic, functional genomic and traditional genetic analysis approaches. Moody can be reached by phone at 515-294-8274, by email at moodyd@iastate.edu, or at her office in 239 Kildee Hall, Ames, IA 50011.