The field of biomedical informatics continues to evolve with the increasing complexity of the health care industry and the diversity of its services and offerings. Public and population health concepts are increasingly important. Researchers from multiple fields are constantly demanding more data. Bench scientists are answering the call and producing more data, resulting in a tremendous need for highly-trained informaticists to manage and analyze the data.

The task of preparing our students to perform as capable leaders and to make important contributions to the informatics field across a wide range of areas is a responsibility that we take seriously here at the Department of Biomedical Informatics at the University of Utah. We have the distinct benefit of being the first biomedical informatics department in the world, so we have tremendous depth in the program that comes from over 50 years of visionary leadership.

With decades of experience, our program has built several vital partnerships within the healthcare industry and government. We have also developed incredible talent. Our faculty and our graduates are regarded as among the best in the world within their specializations, and we are committed to continually improving our program to meet the field’s emerging needs. We also have the advantage of having an impressive pool of data available from our partners.

In the past few years, we have seen steady growth in the department in terms of the number and amount of grants awarded and in faculty publications, while maintaining our strong focus on faculty recruitment and student graduation rates. We believe we’ve only scratched the surface of what informatics can accomplish and work hard every day to increase our capabilities, improve our techniques, and advance the field.

This report provides a snapshot of the department today and looks at where we’ve been and where we’re going. I hope you enjoy reading through the information and learning more about the growth and accomplishments of the Department of Biomedical Informatics.

Best Regards,

Joyce Mitchell, Ph.D., FACMI, FACMG,
Professor & Chair,
Assoc. VP for Health Sciences Information Technology

A MESSAGE FROM THE CHAIR

The mission of the Department of Biomedical Informatics at the University of Utah is to improve health outcomes through information systems, including health, economic, and satisfaction results for consumers and providers, in both the private and public sectors of the healthcare and public health systems. To accomplish this mission, the department assumes three major responsibilities:

1. To educate biomedical and public health professionals, biomedical informaticists, and the healthcare and public health communities in the field of biomedical informatics.

2. To promote and conduct research to broaden biomedical informatics knowledge.

3. To serve health informatics professionals and consumers by participating in relevant professional societies, editorial boards, and continuing education programs, while maintaining biomedical informatics leadership in the community.
The Department of Biomedical Informatics was established in 1964 at the University of Utah. Located in Salt Lake City, the Department is internationally recognized as a leader in biomedical informatics research and education. As one of the largest biomedical informatics graduate training programs in the world, the Department’s faculty and students are a diverse group with a wide range of experience and interests.

Throughout its history, the Department has enjoyed stable leadership. Dr. Homer Warner was chair from 1964 to 1996. Dr. Reed M. Gardner assumed the chair from 1996 to 2005. Both Dr. Warner and Dr. Gardner have received the Morris Collins Award from the American College of Medical Informatics (ACMI) in recognition of their lifetime contributions to the profession. In 2005, Dr. Joyce A. Mitchell, past president of ACMI, took over as chair and has overseen steady growth in the Department.

The Department is recognized as one of the most prestigious training programs for informatics in the world. The Department has granted hundreds of Ph.D. degrees and M.S. degrees. Our alumni have gone on to key positions in academia, clinical medicine, government, and private industry. The Department routinely draws international scholars (both faculty and students) from across North America, South America, Europe, Asia, and Africa, including several Fulbright scholars.

The Department of Biomedical Informatics offers several graduate programs that are customized to students’ interests and educational needs.

- Doctor of Philosophy (Ph.D.)
- Master of Science (M.S.)
- Certificate Program in Informatics (CP)
- Web-based Distance Learning Courses

The program is unique for its strength in each of the primary teaching and research areas: clinical informatics, informatics for translational and clinical research, and public health informatics.

Abundant research opportunities focusing on federated search, medical decision support, public health surveillance, and grid computing, to name a few, are supported in conjunction with the University of Utah Center for Clinical and Translational Science, and a renewed, highly competitive National Library of Medicine Training Grant.

Real-world clinical informatics research and development is ongoing at several of our collaborating institutions: Intermountain Healthcare, home of the renowned HELP electronic medical record, University of Utah Health Care, Huntsman Cancer Institute, Salt Lake City VA Medical Center, and the Utah Department of Health.
The Department of Biomedical Informatics at the University of Utah is the first Biomedical Informatics Department in the world (1964).

The Department is the first Biomedical Informatics program in the United States to be a department in a School of Medicine (1972).

The Department of Biomedical Informatics at the University of Utah has graduated more PhD’s than any other program in the world.

The Department had the largest number of active PhD students in the University of Utah School of Medicine from 2009-2011, and the program has granted more MD/PhD’s than any other department in the School of Medicine.

The Department’s faculty and graduates have served in key design and implementation roles in several major electronic health record software systems, including HELP, HELP2, CCDS, CPRS, and VistA®.

The Department was the first in the nation to create a tightly integrated multi-disciplinary biomedical informatics curriculum with a College of Nursing Informatics Program, which thrives to this day.

Department faculty work in health care networks that care for over 90% of the state of Utah.

The highly successful Utah Population Database (UPDB), which combines extensive genealogy data with clinical and public health data sources, was developed in the Department.

There have been nine high-tech spin-off companies that were built on research conducted in the Department, including Myriad Genetics that has used Department research to create a company focused on breast cancer genetic testing.

Department faculty work in health care networks that care for over 90% of the state of Utah.
The distinguished faculty in the Department of Biomedical Informatics is internationally recognized for contributions to biomedical informatics across a wide range of areas. Our faculty members are a diverse group with unique backgrounds and education from prestigious universities around the world. Most of our faculty members are directly involved in information systems at collaborative institutions. In addition, the Department has a close partnership with the University of Utah Nursing Informatics program, which fosters interdisciplinary research and cross-listing of courses. Our faculty members are dedicated to the continued growth of the biomedical informatics field, so mentoring and teaching are also important missions of the Department.

Biomedical Informatics has recruited 17 talented faculty members over the past seven years, creating numerous additional research opportunities and bolstering the academic mission of the Department. More faculty members mean more collaboration with other institutions and more opportunities to receive grants. (Numbers based on calendar years)
Research grants have always been an essential component to the success and reputation of the Department of Biomedical Informatics. Over the past six years, Department faculty members have seen a steady growth in both the number of faculty writing grants and the dollar amounts awarded. The Department’s grant-funded research covers a variety of interesting and important projects in clinical informatics, population and public health informatics, and clinical research and translational informatics.

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**University of Utah**

- **Biomedical Informatics Training Grant**
  - $5,073,946 (2009)
  - The mission of our program centers on improving health outcomes through the innovative use of information systems, emphasizing clinical informatics, public health informatics, and translational research informatics.

- **Secondary Use of HER Data – Sharp 4**
  - $1,035,813 (pending)
  - University of Utah Biomedical Informatics Training Grant

- **Development of a Statewide Master Person Index**
  - $1,381,688 (pending)
  - Integrated Projects for the Consortium for Healthcare Informatics (CHIR)

- **Extension of the Sequence Ontology: Preparing for the Re-sequencing Revolution**
  - $1,812,134 (pending)
  - University of Utah Biomedical Informatics Training Grant

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**Intermountain Healthcare**

- **University of Utah**
  - $6,933,495 (2008)
  - The grant supports research in clinical informatics and translational research.

- **University of Utah**
  - $9,128,334 (2009)
  - The grant supports research in clinical informatics and translational research.

- **University of Utah**
  - $5,073,946 (2011)
  - The grant supports research in clinical informatics and translational research.

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**University of Utah**

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  - The mission of our program centers on improving health outcomes through the innovative use of information systems, emphasizing clinical informatics, public health informatics, and translational research informatics.
Scholarly productivity is a vital component in the success of the Department of Biomedical Informatics. Our faculty members are highly motivated to have their research published. The goal for each faculty member is to publish five journal articles or conference proceedings each year. And while the number of publications is important, the type and reputation of the publication is also crucial.

TOP 12 JOURNAL LISTINGS

1. Journal of the American Medical Association (JAMA)
2. Journal of the American Medical Informatics Association
3. Journal of Biomedical Informatics
4. Studies in Health Technologies & Informatics
5. BMC Medical Informatics & Decision Making
6. International Journal of Medical Informatics
7. Methods of Information in Medicine
8. BMC Medical Research Methods
9. BMC Bioinformatics
10. Medical Care
11. American Journal of Public Health
12. BMC Medical Genomics
### PRIMARY FACULTY

#### PUBLICATION AVERAGE

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<thead>
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<th>Year</th>
<th>Average</th>
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</tbody>
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### NOTEWORTHY

- **Marlene Eggers, Ph.D.**
  Chair-elect of American Statistical Association

- **Scott Narus, Ph.D.**
  Received Gardner Award for Faculty Excellence

- **Mark Yandell, Ph.D.** and **Lewis Frey, Ph.D.**
  Publications go viral and are “highly cited”

- **Joyce Mitchell, Ph.D.**
  Appointed to NIH Director’s Council of Councils

- **Chris Maloney, M.D.**
  Became Associate Editor for the new AAP Journal, Hospital Pediatrics

- **Scott Evans, Ph.D.**
  Chair of Fall AMIA 2011

- **Donald A.B. Lindberg Award for Innovation in Informatics**

- **Marc Williams, M.D.**
  Consultant to NHGRI on genome info in the EMR

- **Charlene Weir, Ph.D.**
  Elected as new ACMF Fellow

- **Stanley Huff, Ph.D.**
  Member of ONC HIT Standards Committee

- **Qing Zeng, Ph.D.**
  Elected as new ACMF Fellow

- **Per Gesteland, M.D.**
  Homer Warner Best Paper Award

### FACULTY

- **Phil Brewster**
  NCES grant, and the Robert Wood Johnson Foundation Gift (NLM)

- **Joe Dalto**
  AMTC First Place “Best in Show” for poster and oral presentation

- **Shan He**
  Orthner travel award

- **Jason Jacobs**
  CSTE outstanding poster award

- **Liz Workman**
  Houchens best paper award

- **Jingran Wen**
  Houchens fellowship

- **Olga Patterson**
  Morgan Award for Outstanding Grad Student

### STUDENTS

- **Phil Brewster**
  NCES grant, and the Robert Wood Johnson Foundation Gift (NLM)

- **Joe Dalto**
  AMTC First Place “Best in Show” for poster and oral presentation

- **Shan He**
  Orthner travel award

- **Jason Jacobs**
  CSTE outstanding poster award

- **Liz Workman**
  Houchens best paper award

- **Jingran Wen**
  Houchens fellowship

- **Olga Patterson**
  Morgan Award for Outstanding Grad Student

*Excludes instructors*
The past several years have seen a marked increase in collaboration with outside organizations and continued growth with key partners. The Department works closely with University of Utah Health Care on building the technological infrastructure and providing operational support on several comprehensive projects. BMI faculty members also play a critical role in partnerships with the VA Hospital, Intermountain Healthcare, and the Utah Department of Health.

VA MEDICAL CENTER
Project: Developing new Electronic Medical Records database for VA across the United States, Natural Language processing for text extraction, extraction for clinical research from text of medical records – discharge summaries, etc.

INTERMOUNTAIN HEALTHCARE
Project: Clinical information Systems, Utah Bio Health Initiative

UTAH DEPARTMENT OF HEALTH
Projects: Refugee Health, Infectious Disease Reporting, Electronic Medical Records

UNIVERSITY OF UTAH HEALTH CARE
Projects: The FURTHER Project (search electronic medical records in population database), Biomedical Research Informatics Service Corp (BRISC), Utah Bio Health Initiative, Knowledge Management in Clinical Medicine.
Students in the Department of Biomedical Informatics come from all over the world, bringing diverse backgrounds and experience to the program. There are many different avenues available for students to customize their studies as they work toward their degrees and certificates. The program at the Department of Biomedical Informatics runs the entire gamut of the informatics process from the spectrum of molecules and cells, even nanoparticles, to people in clinics to populations. Students find myriad opportunities, facilities, and resources available, providing them with an unparalleled education filled with real-world collaborations with our health care industry partners.

The department offers several graduate programs that are tailored to students’ interests and educational needs.
- Doctor of Philosophy (Ph.D.)
- Master of Science (M.S.)
- Certificate Program in Informatics (CP)

The department has granted more than 125 Ph.D. degrees, including over 25 Ph.D. degrees to students holding Medical Doctorates, and several hundred M.S. degrees. Our alumni continue on to prestigious positions in academia, clinical medicine, government, and private industry.