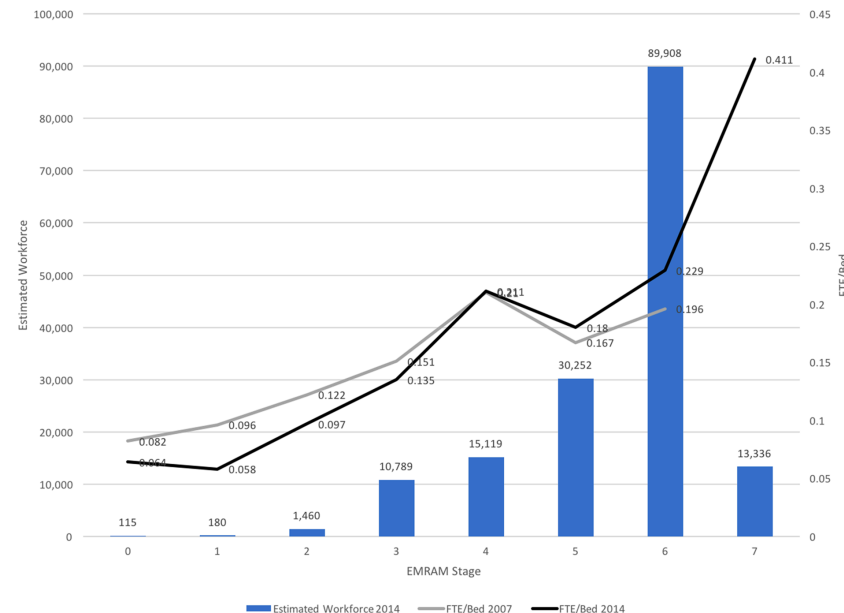# Orientation

Biomedical Informatics Graduate Program

William Hersh, MD
Professor and Chair
Department of Medical Informatics & Clinical Epidemiology
School of Medicine
Oregon Health & Science University
Portland, OR, USA

Overview of today's activities

- Welcome and introductions
- What's new since you applied or matriculated
- Overview of program and majors
- Student etiquette + professional conduct
- Student pictures
- Lunch
- Special talk: Art Papier, MD

What's new

- "Tracks" are now "majors" and renamed
  - Health & Clinical Informatics (HCIN)
  - Bioinformatics & Computational Biomedicine (BCB)
- Master's degrees renamed
  - Formerly Master of Science (MS) and Master of Biomedical Informatics (MBI)
  - Now Master of Science (MS) with or without thesis
- Underlying structure and curriculum mostly the same

New study of healthcare IT workforce shows estimated growth of 19,852-153,114 FTE as EHR adoption increases, and also in other areas (Hersh, 2018)
https://doi.org/10.1093/jamiaopen/ooy029

3

Department of Medical Informatics & Clinical Epidemiology (DMICE)

- One of 26 departments in OHSU School of Medicine
- Mission is to provide leadership, discovery, and dissemination of knowledge in the areas of biomedical informatics and clinical epidemiology
  - Fulfilled through programs of research, education, and service
- Department leadership
  - William Hersh, MD - Chair
  - Cynthia Morris, PhD - Vice Chair for Education and Training
  - Joan Ash, PhD - Vice Chair for Faculty Development
  - Shannon McWeeney, PhD, Head, Division of Bioinformatics & Computational Biology
  - David Dorr, MD, MS - Vice Chair for Clinical Informatics
  - Heidi Nelson, MD, MPH - Vice Chair for Clinical Epidemiology

MEDICAL INFORMATICS & CLINICAL EPIDEMIOLOGY

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DMICE is a national leader

- No official rankings, but OHSU informatics program is
  - 1 of 14 programs to have a National Library of Medicine NIH Training Grant for PhD and postdoctoral students
  - 1 of 9 programs funded under the Office of the National Coordinator Health IT Workforce Development Program
  - 1 of 8 programs funded by the NIH Fogarty Center Informatics Training for Global Health Program in collaboration with Hospital Italiano de Buenos Aires
  - Consistent recipient of research funding, appointment to national leadership positions, publication in high-profile journals, etc.
  - Highly accomplished alumni being productive in many different settings
- Clinical epidemiology program also highly successful, especially in areas of evidence-based medicine and comparative effectiveness research

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OHSU Biomedical Informatics Graduate Program

- http://www.ohsu.edu/informatics/
- Overall goal of program is to train future professionals, researchers, and leaders in area of biomedical and health informatics
  - Tracks focus on different areas of larger field
  - All programs at graduate level, i.e., require a baccalaureate degree
- Diverse students who typically fall into one of two categories
  - "First-career" students more likely to be full-time, on-campus, and from variety of backgrounds
  - "Career-changing" students likely to be part-time, distance, mostly (though not exclusively) from healthcare professions

Program faculty and leadership

- Overall program director – William Hersh, MD
- Leadership
  - William Hersh, MD – HCIN
  - Shannon McWeeney, PhD – BCB
  - Karen Eden, PhD – PhD program
- Over 30 other faculty who teach, advise, mentor projects, etc.

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Program majors (formerly tracks)

- HCIN
  - Original track, focused on informatics and applied data analytics in health, healthcare, public health, and clinical research settings

- BCB
  - Focused on methods and deep analytics applied across omics, imaging, clinical medicine, and public health

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Degrees and certificates

- Doctor of Philosophy (PhD)
  - For those who wish to pursue research, academia, or leadership careers
- Master of Science (MS) thesis
  - Research master's, including for those with doctoral degrees in other fields who wish to pursue research careers
- Master of Science (MS) non-thesis
  - Professional master's degree for practitioners and leaders
- Graduate Certificate
  - Subset of master's degree as an introduction or career specialization (HCIN major only)
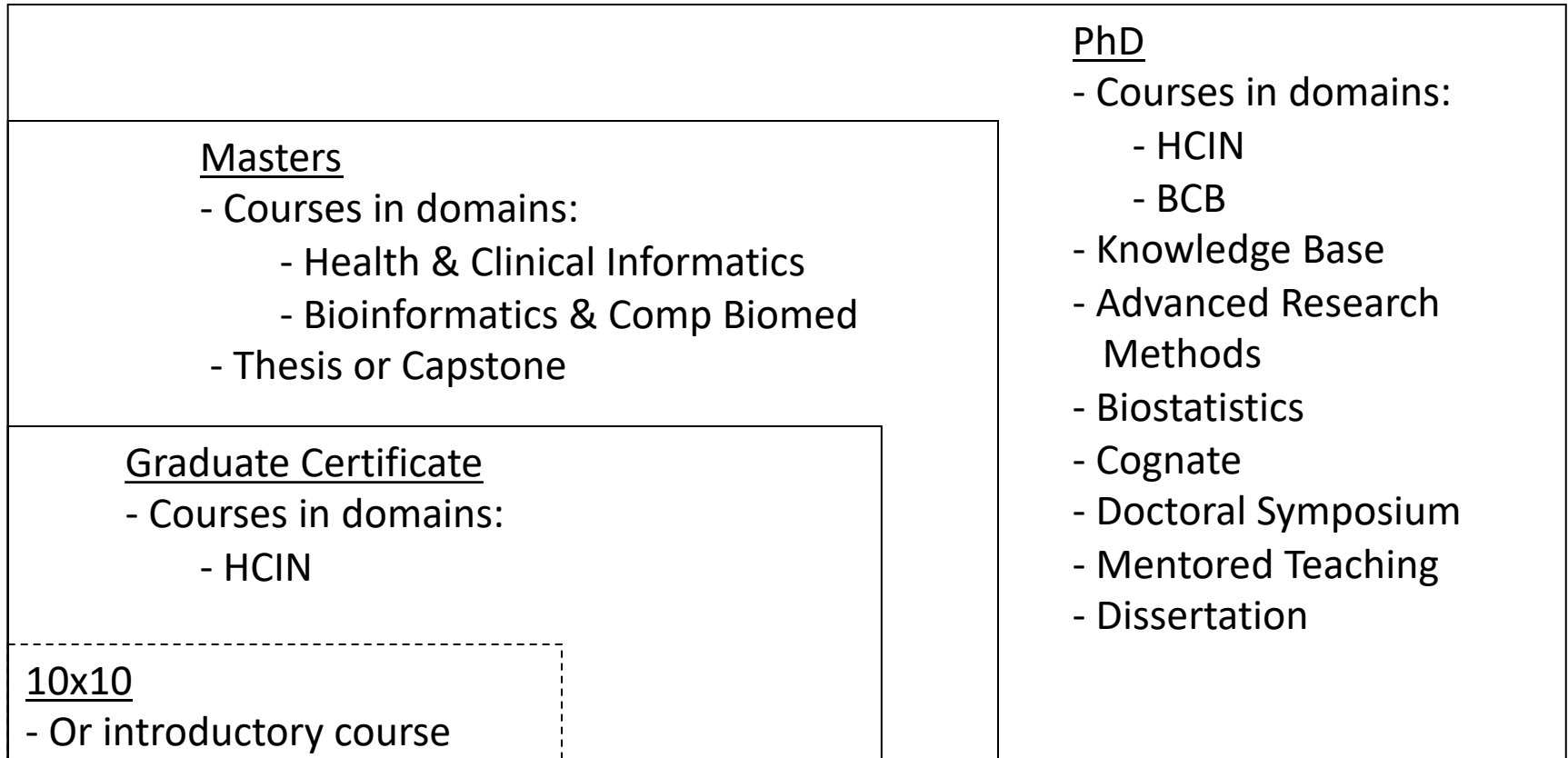
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Tracks, degrees and certificates, and availability

Degree/Certificate Major	PhD	MS thesis	MS non-thesis	Grad Cert
HCIN	On-campus	On-campus	On-campus On-line	On-campus On-line
BCB	On-campus	On-campus	On-campus	

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Curriculum

- Curriculum in each track for degree programs (master's and PhD) organized into domains, each of which may have courses that are
  - Required
  - Individual competency ("k of n")
  - Elective
- Core curriculum of degree programs is knowledge base plus additional courses
  - MS thesis = knowledge base + thesis
  - MS non-thesis = knowledge base + capstone (can be internship)
  - PhD = knowledge base + additional advanced work, including dissertation

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Building block approach

Masters
- Courses in domains:
    - Health & Clinical Informatics
    - Bioinformatics & Comp Biomed
  - Thesis or Capstone

Graduate Certificate
- Courses in domains:
    - HCIN

10x10
- Or introductory course

PhD
- Courses in domains:
    - HCIN
    - BCB
- Knowledge Base
- Advanced Research
  Methods
- Biostatistics
- Cognate
- Doctoral Symposium
- Mentored Teaching
- Dissertation

Other programs

- Fellowships
  - Predoctoral and postdoctoral funding from National Library of Medicine and National Institutes of Health institutes since 1992
  - Clinical informatics fellowship for physician board-certification started in 2015
- 10x10 ("ten by ten")
  - Continuing education course in clinical informatics
  - Adaptation of on-line introductory course (BMI 510), with option to pursue further study at OHSU
  - Nearly 2500 have completed course since 2005, with about 10-15% going on to additional graduate study

OHSU informatics program provides value

- For tuition and fees comparable to other programs, get
  - Cutting-edge curriculum based on solid foundation
  - Faculty who are international leaders in research and practice
  - Internship/practicum experience
  - Career development and advising
  - Connections to industry and others

Alumni – 757 degrees and certificates awarded to 691 people

Major* Certificate/Degree	Health & Clinical Informatics**	Bioinformatics & Computational Biomedicine***	Total
Graduate Certificate	422	N/A	422
MS with Thesis****	74	21	95
MS without Thesis*****	196	17	213
PhD	18	9	27
Total	710	47	757
Number of students receiving degrees and certificates: 691			

* Formerly Track
** Includes formerly Clinical Informatics and Health Information Management Tracks
*** Includes formerly Bioinformatics & Computational Biomedicine Track
**** Includes formerly Master of Science
***** Includes formerly Master of Biomedical Informatics and Master of Medical Informatics

International students from: Argentina, Singapore, Thailand, Egypt, Israel, Saudi Arabia, Zimbabwe, China, and other countries

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Some job titles and employers

- Product manager
- Data analyst
- Informatics researcher
- Consultant
- Project manager
- Terminology engineer
- Software engineer
- Chief medical informatics officer
- Information systems manager
- Bioinformatician
- Database administrator/architect
- Faculty

- OHSU
- Providence Health System
- Kaiser-Permanente
- OCHIN
- Impact Advisors
- Health Share of Oregon CCO
- Epic
- Cerner
- Intel
- Sutter Health
- National Library of Medicine
- Harvard Medical School
- University of Virginia

Health & Clinical Informatics major

- Primary goal of clinical informatics track is to educate the future developers and managers of health care information systems

- Individuals with a variety of backgrounds are provided a strong technical grounding in clinical informatics, health and medicine, computer science, and research methods so that they may assume positions that require a thorough understanding of both information technology and the health care environment
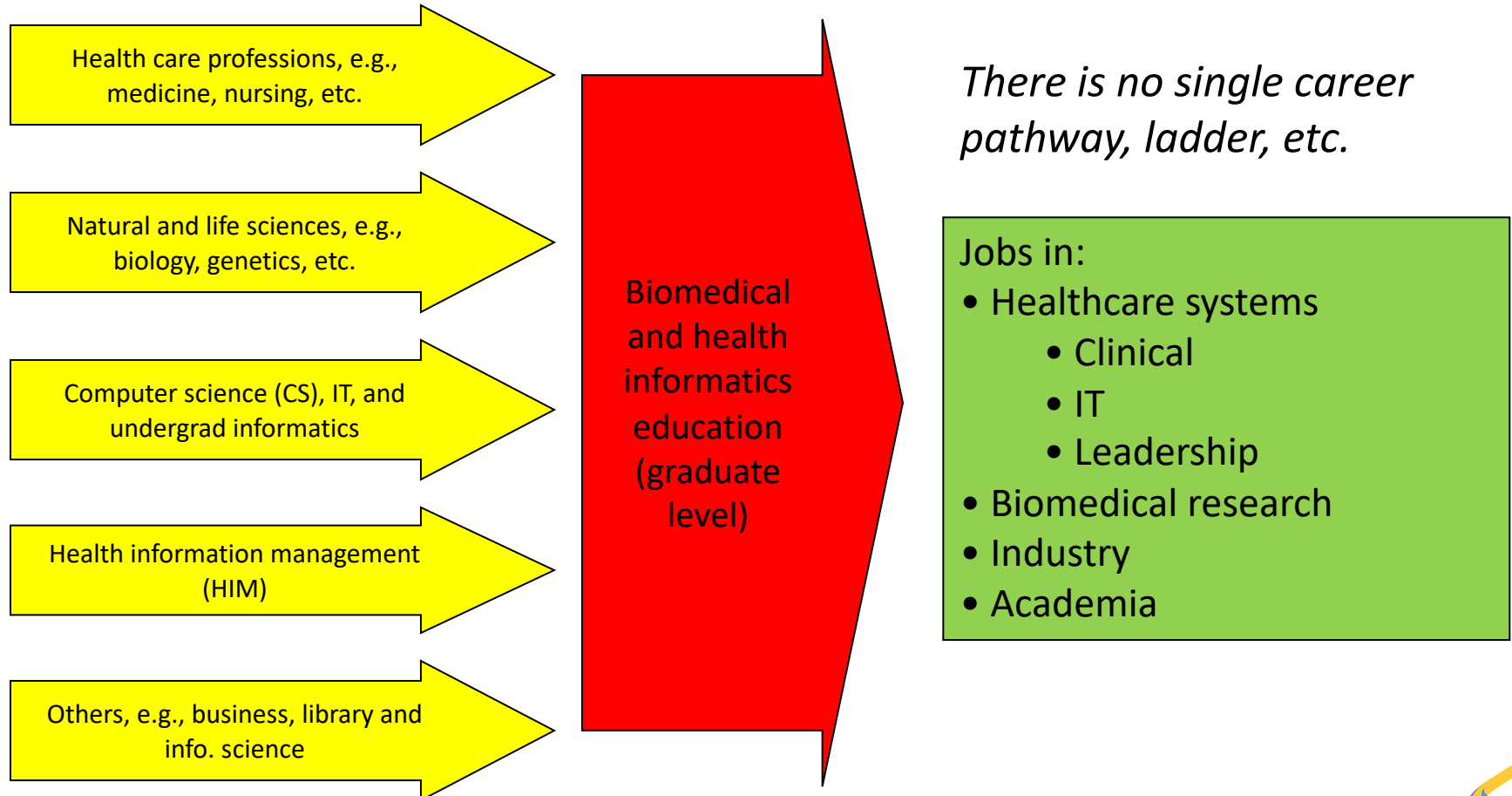
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Domains of clinical informatics

- Basic principles of **biomedical informatics** to problems in different domains of health and biomedicine
- Operational knowledge of the human body in **health and disease** as well as the **organization of the health care system**
- Principles of **organizational behavior and management** skills to biomedical informatics problems
- Basic statistics and quantitative or qualitative **research methods** to evaluative research projects
- Basic **computer science** principles to problems in health and biomedicine
- Students will be adept in the tools of **advanced scholarship** , including the ability to address ethical issues in the field, communicate effectively in oral and written form, and complete a thesis (MS degree), capstone (MBI degree), or dissertation (PhD degree)
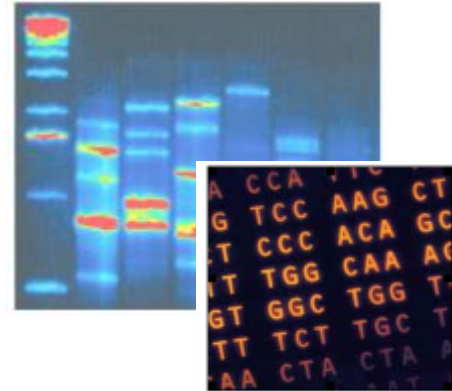
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Emerging aspects of clinical informatics

- Focus shifting from implementing to optimizing clinical informatics systems
  - Latest (more than a) buzzword: *analytics*
    - In reality, program already offers course content in statistics, healthcare quality, clinical data standards, etc.
    - New courses and grant projects adding more
- For physicians, new subspecialty of clinical informatics
  - Subspecialty of any primary specialty
  - Additional certification options likely forthcoming for non-physicians

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Clinical informatics career pathways have diverse inputs and outputs

Health care professions, e.g., medicine, nursing, etc.

Natural and life sciences, e.g., biology, genetics, etc.

Computer science (CS), IT, and undergrad informatics

Health information management (HIM)

Others, e.g., business, library and info. science

Biomedical and health informatics education (graduate level)

There is no single career pathway, ladder, etc.

Jobs in:
- Healthcare systems
  - Clinical
  - IT
  - Leadership
- Biomedical research
- Industry
- Academia

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DMICE online

- DMICE seminars
  - YouTube: https://www.youtube.com/channel/UCCekPERb6i3xXEDQxwlCeIA
- Web and blog
  - Web: http://www.ohsu.edu/informatics
  - Blog: http://www.ohsu.edu/blogs/health-data/
- Social media
  - Facebook: https://www.facebook.com/ohsu.informatics
  - Twitter: @OHSUInformatics

Thank You!

William Hersh, MD

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School of Medicine

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Portland, OR, USA

Email: hersh@ohsu.edu

Web: www.billhersh.info

Blog: http://informaticsprofessor.blogspot.com
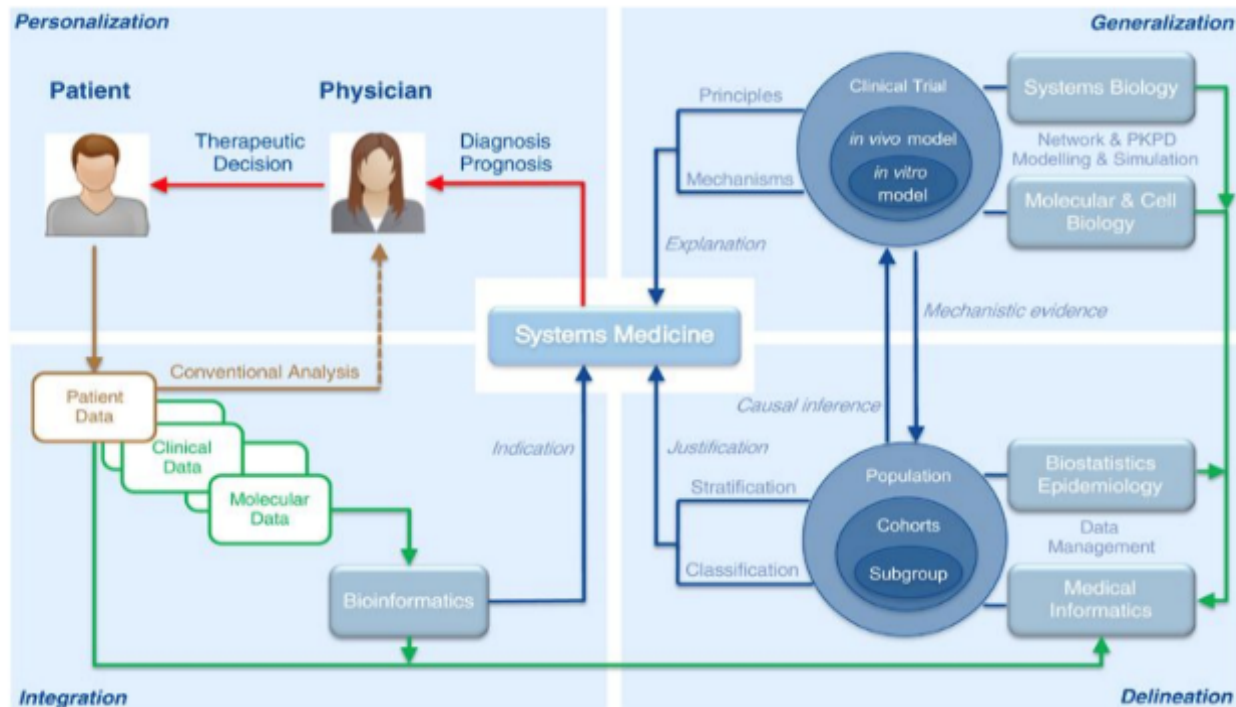
Twitter: @williamhersh

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OHSU Bioinformatics & Computational Biomedicine

DATE: Thursday, September 20, 2018 PRESENTED BY: Ted Laderas, Assistant Professor
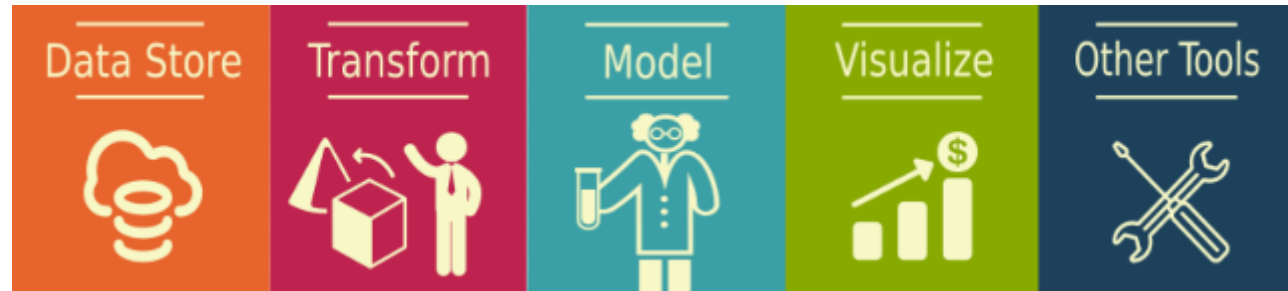
Computational Biomedicine
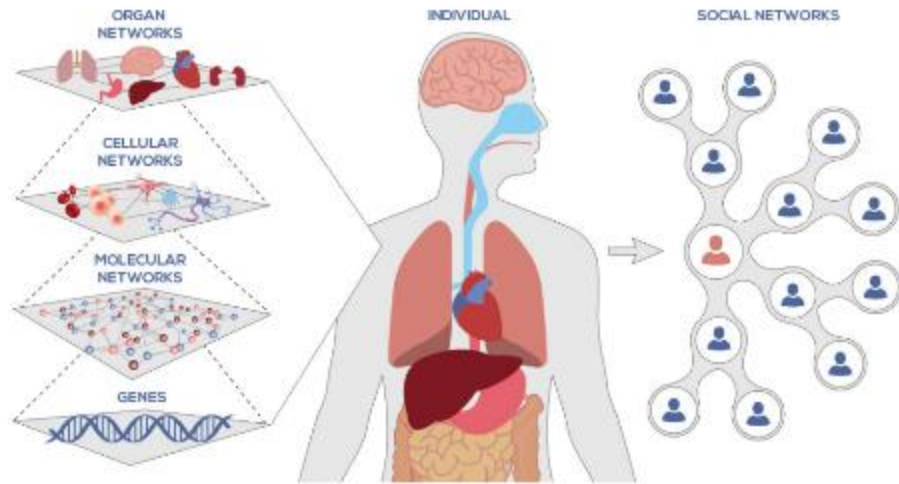
Interdisciplinary
Collaborative
Integrative

Systems medicine as an integrative approach, combining technologies, data, methodologies and expertise. Brown: Conventional analysis of patient data. Green: Data flow. Blue: Information flow, linked to the disciplinary expertise involved.

Figure from Apweiler, et al 2018

Some of Our Active Areas of Study

Analytics and Data Science

Systems and Network Biology

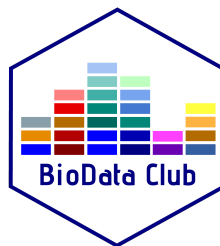(Applications to Cancer, Infectious Disease, etc)

1st Year Framework

- Yr1 Summer: R Bootcamp, Research Rotations for PhD Students

- Yr1 Fall, Winter, Spring: Core Coursework and Research Rotations

- Yr1 Spring: BCB Research Methods (Mentored Research), Planning for Summer Internships (MS and PhD)

BioData Club

Data Science Meetup in a Box

 Skill Sharing

 Co-Learning

 Community

https://biodata-club.github.io/

To join Slack or mailing list: laderast@ohsu.edu

Future Job Prospects

Industry	Academia	Government	Private Firms
Biotech Pharmaceutical	Universities Academic Hospitals Research Centers	National Institute of Health VA Medical Center	Many Opportunities

- **Masters Degree**
  - Staff Bioinformaticist (Academic and Industry)
  - Analyst (Academic and Industry)
- **PhD**
  - Postdoctoral Fellowships (Academic and Industry)
  - Faculty Positions (Academic)
  - Senior Analyst (Academic and Industry)
  - Staff Scientist (Academic and Industry)
  - Group Leader (Industry)

Other ways to stay connected

- BCB focused DMICE seminars
  - Thursdays at 11:30
  - Live stream and archive on YouTube

- BCB Facebook & twitter feeds

  Facebook: ww.facebook.com/OHSUBioinformatics

  Twitter: www.twitter.com/OHSUBCB

  Website: http://ohsu.edu/bioinformatics

Thank You

Logistics

Student Progress

- Faculty are very busy BUT students are a top priority

- They will state best way to contact them at beginning of course or advising, which is usually email

- Program staff provide additional help and tools (e.g., forecasting sheets)

- Faculty should respond to simple matters via email within two business days

- More detailed responses may require meeting and/or involvement of program staff

Key Program Personnel

- Diane Doctor, Student Support and Internship Coordinator
  - Email: doctord@ohsu.edu
  - Office: BICC 504, Office phone: 503-494-4794

- Lynne Schwabe, Administrative Coordinator and Program Coordinator for CI Fellowship
  - Email: schwabel@ohsu.edu
  - Office: BICC 504, Office phone: 503-418-1566

Key Program Personnel

- Amy Forester, Sakai Support
  - Email: sakai@ohsu.edu
  - Office SON 476, Office: 503-494-7074 Toll Free: 877-972-5249

- Virginia Lankes, Career Development Specialist
  - Email: lankes@ohsu.edu
  - Office: BICC 504, Office phone: 503-494-2331

- Lauren Ludwig, Recruiting/Admissions
  - Email: ludwigl@ohsu.edu
  - Office: BICC 504, Office phone: 503-494-2252

- Andrea Ilg, Educational Program Manager
  - Email: ilgan@ohsu.edu
  - Office: BICC 504, Office phone: 503-494-2547

Communication

- Notices are sent via email.

- ALL notifications will be sent to your OHSU email address!

Registration/Course Planning

- Complete registration online. "Student Resources" page includes program information by degree, links to Class Information/Forecasting, Course Catalog with syllabi, Forms, etc.
- Course schedules are provided on the flash drive as well as on the online registration web page.
- Forecasting worksheets are included on the flash drive and can be used as guidelines for planning your schedule.
- 9.0+ credits = full-time student status.
- 5.0 to 8.0 credits = part-time student status.

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Textbooks

- Students may buy or rent textbooks at amazon.com, abebooks.com, half.com, ebay, cengagebrain.com, coursesmart.com, chegg.com, Barnes and Noble, Powells. Some are free online at www.academia.edu. Google search, OHSU Library.

  – Make sure you have the correct ISBN number when ordering your book online.

Online Course Evaluations

- The Blue Course Evaluation Tool has been created to allow increased access to the course evaluations that are a required part of the School of Medicine curriculum. The tool is built into Sakai online courses.

  – Course evaluations are completed quarterly.

  – Are a required part of the curriculum.

  – Evaluations are anonymous.

  – The feedback is instrumental in faculty planning.

Student ID Badges

- Work with Diane Doctor to ensure proper paperwork is complete to procure ID Badge

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Weekly Informatics Research Conference

- Place to learn about new developments in field and project/employment opportunities.
- Forum for students to present dissertation/thesis proposals, /dissertation/thesis defenses and research in progress.
- Thursdays in BICC 124 (Theater) at 11:30 am (may change due to room availability).
- Attendance is taken. Funded students are required to attend, others are strongly encouraged.
- Presentations are recorded and posted to our You Tube channel
  https://www.youtube.com/channel/UCCekPERb6i3xXEDQxwlCeIA

Transportation

- ## Tri-Met Bus Service
  - OHSU offers highly subsidized for annual Tri-Met bus passes available in the Parking Office.
  - Students need to provide proof of full-time status to receive the bus pass at the discounted rate.

- ## Tram and Streetcar
  - Your OHSU ID badge is good on the Tram and the Streetcar.

Parking

- Day pass parking is $15 and needs to be purchased online at:

https://o2.ohsu.edu/facilities-and-logistics/services-for-individuals/parking/day-parking-permits.cfm

- Pay station available at the Dotter Lot. Rate of $15 per day.

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Student Workers

- A number of you are interested in part-time jobs.

- We have the following available:

  – Teaching assistants – in classes you have previously completed.

  – Other projects in the department.

  – Pay starts at $15 per hour for 5-10 hours per week of work.

- If interested, please email a resume to Diane at doctord@ohsu.edu.

Remainder of Today

- Student Etiquette + Professional Conduct

- Lunch

- Informatics Research Conference

Questions and Discussion

Thank You

Communication, Professional Conduct, Equity and Inclusion

DATE: September 20, 2018   PRESENTED BY: Diane Doctor

Objectives of Presentation

- Overall view of the importance of communication with instructors and others in the department
    - It's a 2-way street
    - Student responsibility to speak up - - Instructor/TA and Administrative staff
- Point out some key areas to review on professional behavior and ethical standards
    - Developing exceptional writing skills
    - Developing solid mentor/mentee relationships
    - Committing to Ethical Standards in ALL research activities
- Discuss the Commitment to Diversity by OHSU and DMICE
    - OHSU Diversity Office
    - DMICE Diversity Plan
    - Exceptions for individual ongoing diversity training

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Overall Communication -Listed in Course Syllabus

DMICE COMMUNICATION POLICY

- If the syllabus directs the student to contact the TA before contacting the instructor, the student should do so. Otherwise, the student should contact the instructor and allow 2 business days (not including weekends) for a response.

- If the student does not receive a response from the instructor within 2 business days, s/he should contact the TA (if there is one). When contacting the TA s/he should cc the instructor and Diane Doctor at doctord@ohsu.edu.

- If a student does not receive a response from the TA within 1 business day (not including weekends), s/he should contact Diane Doctor at doctord@ohsu.edu and cc the instructor and the TA.

- If Diane does not reply within 1 business day (not including weekends), the student should contact Andrea Ilg at ilgan@ohsu.edu.

- Students having difficulties with Sakai should contact the Sakai Help Desk at sakai@ohsu.edu or at (877) 972-5249. Sakai help is available M-F from 8am to 9 pm and weekends from Noon to 5pm. Do not contact the instructor.

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Communication: Best practice for mentor and mentee and Ethical Behavior

School of Medicine Website:

[Ethics: How do ethics intersect with the mentee-mentor relationship](#)

Ethical Standards -Listed in Course Syllabus

ACADEMIC HONESTY

- Course participants are expected to maintain academic honesty in their course work. Participants should refrain from seeking past published solutions to any assignments. Literature and resources (including Internet resources) employed in fulfilling assignments must be cited. See http://www.ohsu.edu/xd/education/library/research-assistance/plagiarism.cfm?WT_rank=1# for information on code of conduct for OHSU and

- http://www.ohsu.edu/xd/education/teaching-and-learning-center/for-students/index.cfm for more information on citing sources and recognizing plagiarism.

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Use of "Turn-It-In"
-Listed in Course Syllabus

- In an effort to uphold the principles and practice of academic honesty, faculty members at OHSU may use originality checking systems such as Turnitin to compare a student's submitted work against multiple sources. http://turnitin.com/

- To protect student privacy in this process, it will be necessary to remove all personal information, i.e. student name, email address, student u-number, or any other personal information, from documents BEFORE submission.

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Excellence in Writing

- Brush up on basic writing skills if you have not taken a college course for awhile

- Take Department Writing Course (required for some programs)

- Speak with your instructor, mentor, TA if you feel you need help

- Understand the culture of academic writing in the U.S.
    - Follow the style guide that instructor wants- APA, MLA, etc.
    - Be very careful to follow citation principles within the text of the narrative.
    - Develop professional References
    - Avoid "Plagiarizing"

Complete the required training

Students are responsible for knowing and completing different policies:

- Complete Responsible Conduct of Research (RCR) in Compass at https://ohsu.csod.com/client/ohsu/default.aspx

See also:

- [Professional Conduct Policy](#)

- [How to Recognize Plagiarism](#) (use IE or Firefox)

- [Compass Training](#)s listed in "Welcome" letter

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Unprofessional Conduct

Difficult words : "You plagiarized." If your TA or your Instructor indicates that you used someone else's work, without citing it in your narrative or in your reference list, contact your instructor immediately. They may discuss options with you, and/or you will be reported to the Professional Conduct Committee in DMICE

- **Most complaints are handled by the Professional Conduct Committee in DMICE**

- If unacceptable conduct has occurred, sanctions may be recommended, including
    - A change in grade for the course. (Note: the instructor may, in addition, change a grade on any assignment involved)
    - Letter of reprimand
    - Probation
    - Recommendation to the Dean for suspension or dismissal

Equity and Inclusion –Listed in Course Syllabus

COMMITMENT TO EQUITY AND INCLUSION

Oregon Health & Science University is committed to creating and fostering a learning and working environment based on open communication and mutual respect. If you encounter sexual harassment, sexual misconduct, sexual assault, or discrimination based on race, color, religion, age, national origin or ancestry, veteran or military status, sex, marital status, pregnancy or parenting status, sexual orientation, gender identity, disability or any other protected status please contact the Affirmative Action and Equal Opportunity Department at 503-494-5148 or aaeo@ohsu.edu. Inquiries about Title IX compliance or sex/gender discrimination and harassment may be directed to the OHSU Title IX Coordinator at 503-494-0258 or titleix@ohsu.edu

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Expectations: DMICE Diversity Plan

- Engage and participate in community diversity events, outreach and partnerships by creating a schedule of possible events and a list of departmental personnel to attend such events. Based on the total number of possible events, their timing, and their specific focus, define a list of relevant events and attend several each year.
    - Widely distributed through OHSU website, SOM news, etc.
    - Distributed within department communication as well

- Document 2 diversity events attended by individual (can be discussions in meetings, e.g. read and discuss an article on GLBT issues in workplace; attend lectures on culturally specific issues, e.g. health issues for Hispanic population.
    - Each year we survey faculty, staff, and those NIH student grantees to document our successes

Center for Diversity & Inclusion: http://www.ohsu.edu/xd/about/vision/center-for-diversity-inclusion/

Professional Conduct

Professional Conduct Policy for Graduate Programs of the School of Medicine
Approved by Graduate Council: 1-11-05

1. General statement of ethics and professional behavior

These guidelines have been developed to enhance the students' training, maximizing the benefits to their profession and society, and to minimize actions that do not benefit the greater good and only selfishly serve the individual.

following:

- Academic achievement demonstrated by successful completion of coursework and substantial progress in research training

- Pursuit of knowledge that enhances the image of the University and the student's professional field

- Advancement of the University mission through research, education, healing and community service

- Respect for human and animal participants in research and treatment of these participants in a thoughtful and humane manner

- Responsible conduct in the acquisition and communication of scientific findings

- Favorable representation of the institution during all professional activities

- Stimulation of interactions with colleagues to enhance the extended professional community

- Achieving the highest standards of relevant professional fields and societies

3. Statement of meritorious behavior

Additional activities exist for graduate students to enhance their experience in higher education. These endeavors extend beyond the general performance expectations and can significantly enhance their overall professional training and serve the higher goals of their institution and profession. It is important that these activities are encouraged, acknowledged and cultivated

Professional Conduct Policy for Graduate Programs of the School of Medicine
Approved by Graduate Council: 1-11-05

1. General statement of ethics and professional behavior

Graduate professional training includes more than coursework. An essential facet of this training is the acceptance of a code that outlines responsible behavior for the students. This code specifies the obligations students have to others, to their program and profession, to their institution and to the public. These guidelines have been developed to enhance the students' training, maximizing the benefits to their profession and society, and to minimize actions that do not benefit the greater good and only selfishly serve the individual. Learning and adhering to this code will create a positive academic atmosphere and expose the student to behaviors and attitudes required for success in the academic community.

2. Expectations of a graduate student

Behaviors and activities expected of all graduate students of the School of Medicine include the following:

- Academic achievement demonstrated by successful completion of coursework and substantial progress in research training

- Academic achievement
- Pursuit of knowledge
- Advancement of the University mission
- Respect
- Responsible conduct in science
- Favorable presentation of the University

community

- Achieving the highest standards of relevant professional fields and societies

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- Responsible conduct in the acquisition and communication of scientific findings

- Favorable representation of the institution during all professional activities

- Stimulation of interactions with colleagues to enhance the extended professional

- Publishing
- Building teaching and communication skills
- Involvement in professional societies
- Community outreach for the sciences

profession. It is important that these activities are encouraged, acknowledged and cultivated

Thank You