



Pharmacy Informatics

What is the difference between
pharmacy informatics and
pharmacoinformatics?

Barry McClain PharmD MS

<https://www.pharmacyinformatics.net>





Getting Technical with Definitions -Pharmacoinformatics

- pharmaco-
 - relating to drugs
- Informatics
 - the science of processing data for storage and retrieval; information science
- Thus,
 - the science of processing data for storage and retrieval; information science, relating to drugs





Getting Technical with Definitions

-Pharmacy Informatics

- Pharmacy
 - the science or practice of the preparation and dispensing of medicinal drugs
- Informatics
 - the science of processing data for storage and retrieval; information science
- Thus,
 - the science of processing data for storage and retrieval; information science, relating to pharmacy



PubMed Search, Pharmacoinformatics Versus Pharmacy Informatics

PubMed®
pharmacoinformatics
Advanced Create alert Create RSS Clipboard (500)

PubMed®
"pharmacy informatics"
Advanced Create alert Create RSS Clipboard (500)

MY NCBI FILTERS

564 results

RESULTS BY YEAR

1992 2023

Did you n

1 P

Cite F

Share K

G

J

P

MY NCBI FILTERS

87 results

RESULTS BY YEAR

1997 2023

1

Cite

Share





Top Twenty Keyword, Mesh Term, or Substance

OT	Keyword
MH	Mesh Term
RN	Substance

Pharmacoinformatics OT MH RN	Count of PubMedID	Pharmacy Informatics OT MH RN	Count of PubMedID
Humans	291	Humans	60
Animals	139	pharmacy informatics	18
Molecular Docking Simulation	89	United States	16
Models, Molecular	75	Pharmacy Service, Hospital/*organization & administration	10
0 (Ligands)	60	Informatics	9
Ligands	59	Female	9
Molecular Dynamics Simulation	57	Curriculum	8
Molecular docking	55	Male	7
Molecular Structure	51	*Medical Informatics	7
Binding Sites	49	technology	6
Male	47	Surveys and Questionnaires	6
Protein Binding	46	*Pharmacy	6
Quantitative Structure-Activity Relationship	44	*Pharmaceutical Services	6
Structure-Activity Relationship	43	*Students, Pharmacy	6
Protein Conformation	39	Retrospective Studies	5
0 (Enzyme Inhibitors)	38	Medication Errors/*prevention & control	5
Computer Simulation	35	Pharmacists	5
Virtual screening	34	Middle Aged	5
Mice	33	health informatics	5
pharmacoinformatics	32	Electronic Health Records	5





Using Computational Strategies for Drug Discovery

- Experimentation is referred to 'in silico'¹
- Molecular modeling approaches such as:
 - quantitative structure-activity relationships
 - Pharmacophores
 - Homology models
- Computational and analytical methods such
 - Machine learning
 - Data mining
 - Network analysis tools



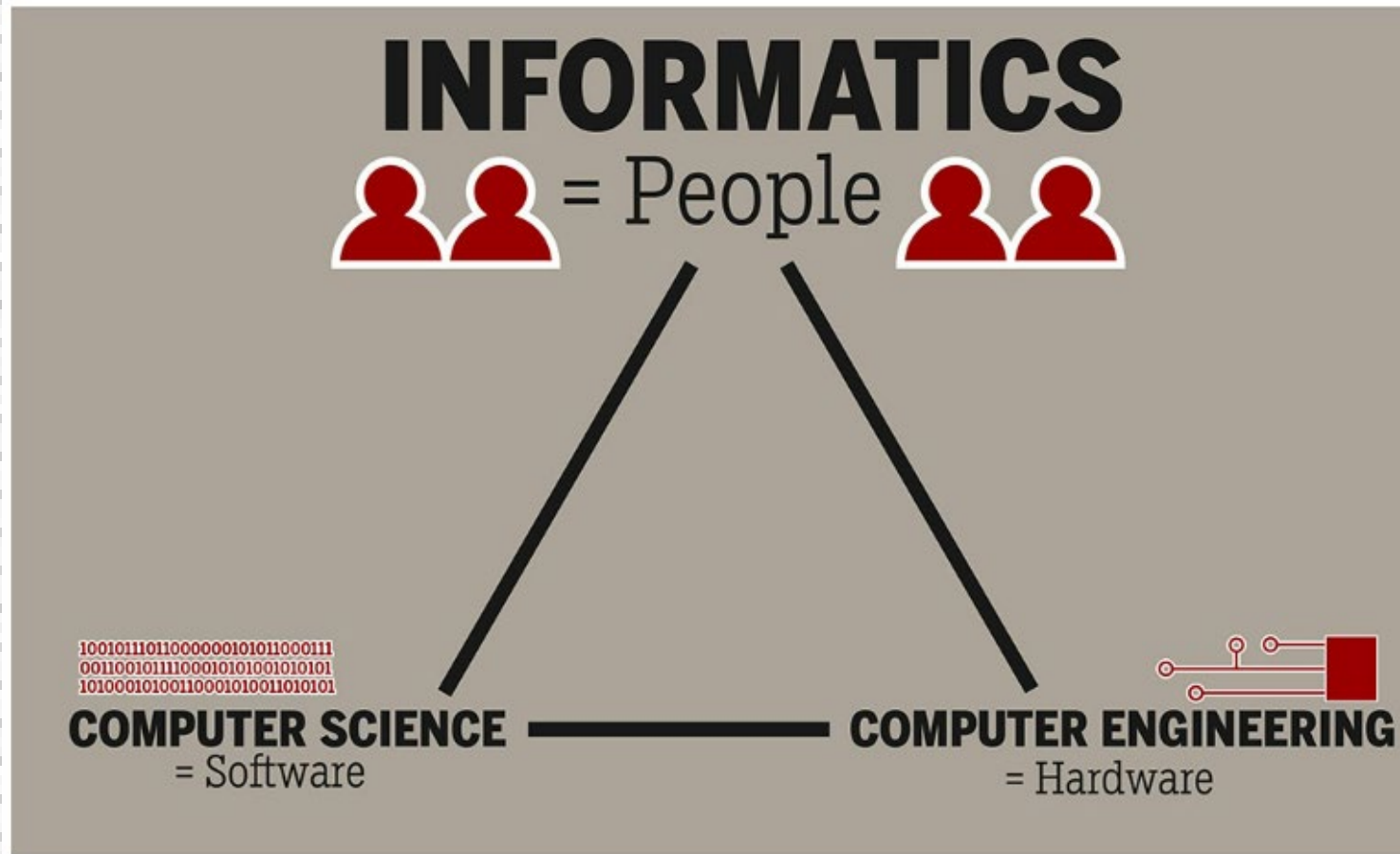


Branches of Informatics

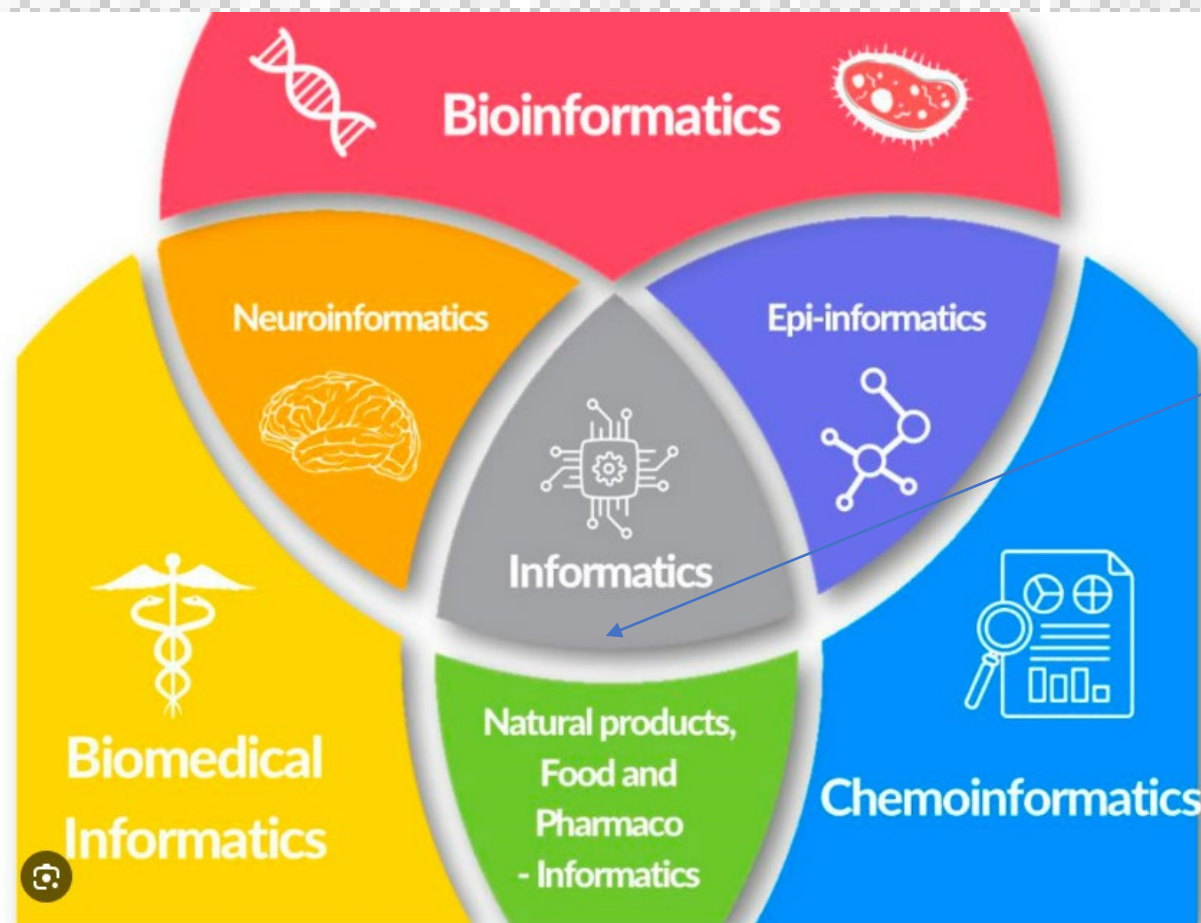


What is Informatics?

- Simple Definition



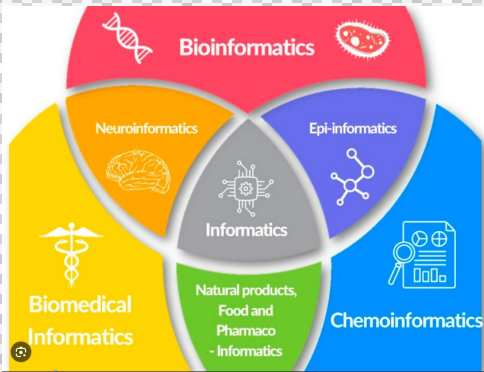
Where Does Pharmacoinformatics Live?



Somewhere in the intersection bioinformatics, chemoinformatics, and biomedical informatics



Where Does Pharmacy Informatics Live?



Informatics = People + Information + Technology

Biomedical and Health Informatics

**Bioinformatics
(cellular & molecular)**

**Imaging Informatics
(tissues & organs)**

**Clinical Informatics
(individual patients)**

**Public Health Informatics
(populations & society)**

Nursing Informatics

Pharmacy Informatics

Consumer Health Informatics

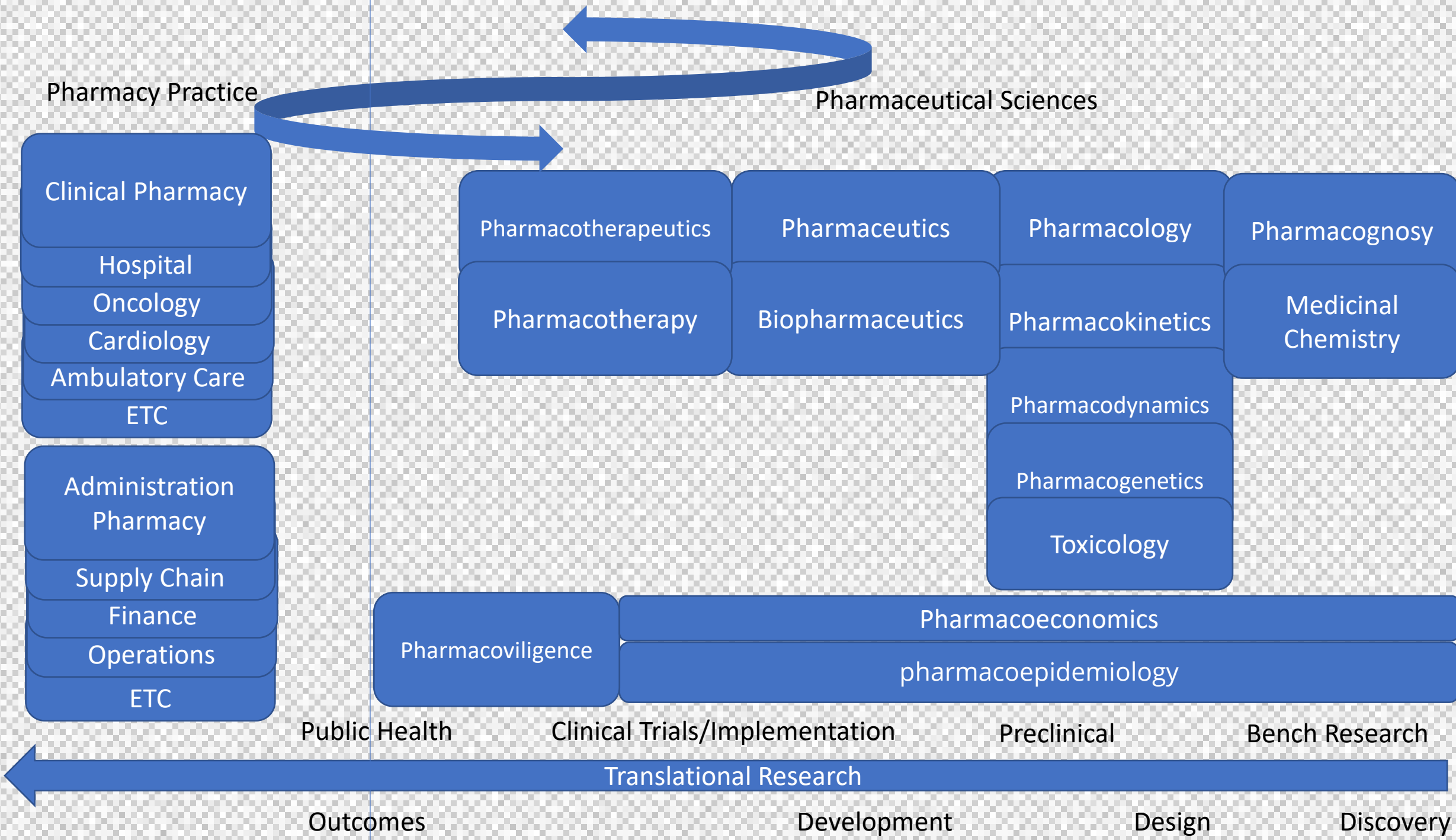
**[Other Clinical Field] Informatics
(e.g. medical)**





Branches of Pharmacy Practice and Pharmaceutical Sciences





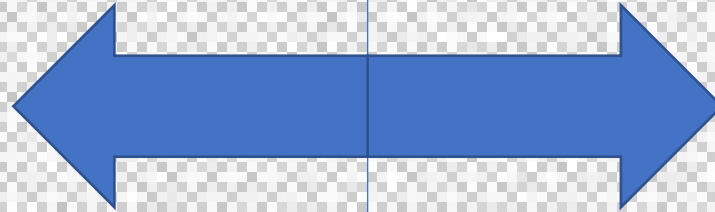


Pharmacy Practice

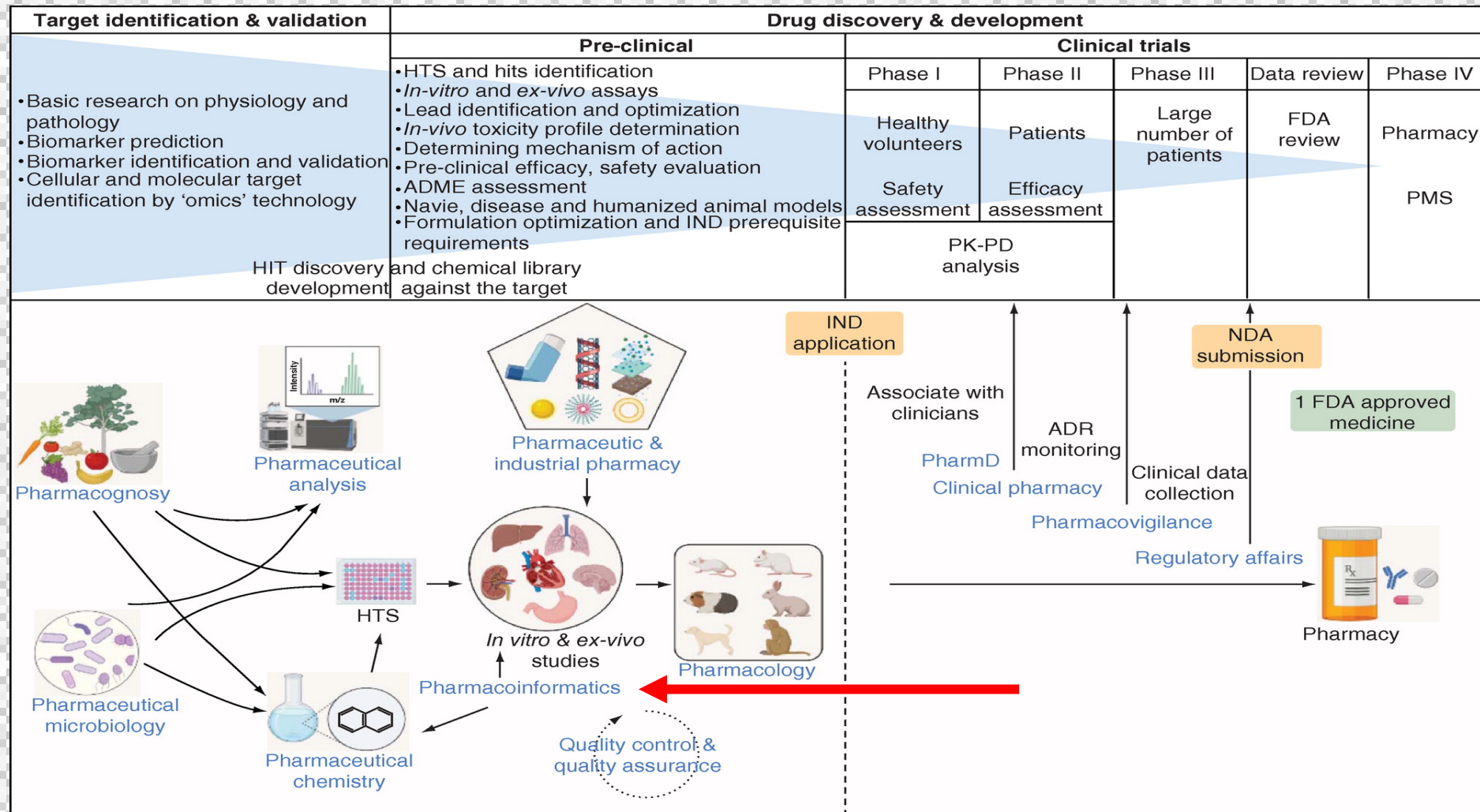
Pharmaceutical Sciences

Pharmacy Informatics

Pharmacoinformatics



Stages of Drug Discovery and Development



What does all of this really mean?



Pharmacogenetics Versus Pharmacogenomics

- Pharmacogenetics has been defined as the study of variability in drug response due to heredity [1]. More recently, with the fashion for adding the suffix ‘... omics’ to areas of research, the term ‘pharmacogenomics’ has been introduced. While the former term is largely used in relation to genes determining drug metabolism, the latter is a broader based term that encompasses all genes in the genome that may determine drug response [2].
The distinction however, is arbitrary and both terms can be used interchangeably.
- Pharmacoinformatics versus pharmacy informatics
- [tomayto, tomahto?](#)





Getting Picky?

- Pharmacoinformatics Workgroup
- AMIA members who are interested in the intersection of informatics, technology and medication management





So What is the Conclusion?

- Pharmacy informatics is focused on the use of information technology to drive pharmacy practice and enhance the medication use process
- Pharmacoinformatics is focused on the use of computational power to enhance the throughput of drug discovery by using data
- As it stands in current state, there is not a lot of overlap between practice of pharmacy informatics and the science of pharmacoinformatics



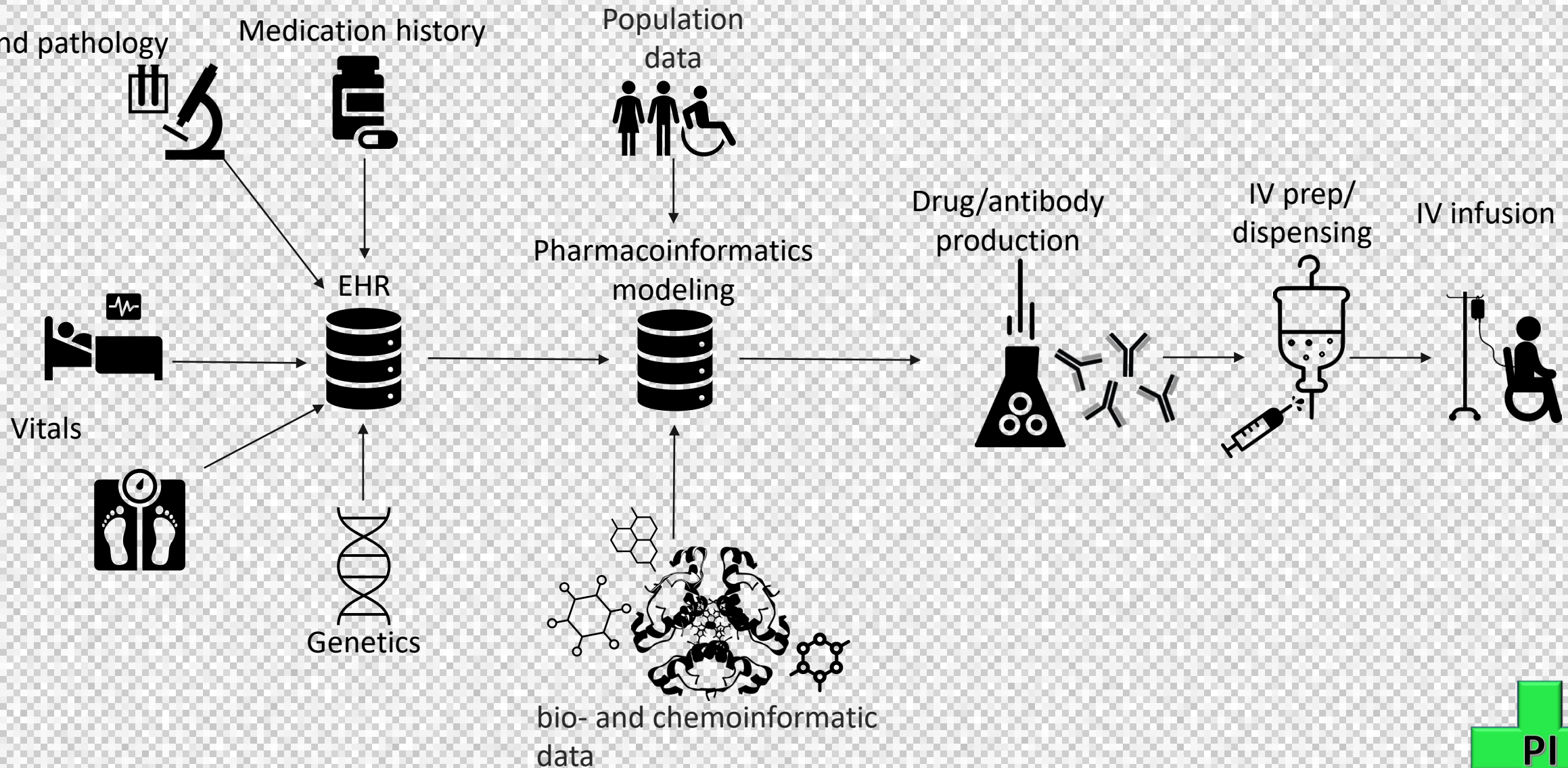


Future?

- That does NOT mean there is no value or synergy between both concepts
- Imagine a precision medicine use-case where combining the clinical data set in an EHR (e.g. genetics, labs, pathology, etc) and computer models to design an antibody therapy, that produces instructions to manufacture, dose, and dispense the product that is completely unique to an individual patient on-site.
- That ultimately is what the power of combining pharmacy informatics and pharmacoinformatics principles look like in a futuristic model
- Perhaps if we want to get technical, it is the opinion of this author to consider this a practical example of pharmacy informatics through the integration of pharmacoinformatics models



Graphic showing the combined model





It Does not End Here

- Pharmacocybernetics:
 - Pharmacocybernetics is an upcoming interdisciplinary field that supports our use of medicines and drugs through the combined use of computational technologies and techniques with human-computer-environment interactions to reduce or prevent drug-related problems
- Digiceuticals
 - use of digital technologies to improve patient care through the use of mobile apps, wellness assessments, and trackers to monitor the impact of drugs on physiology
- Digital therapeutics
- Telemedicine and telepharmacy
- Etc.

<https://www.igi-global.com/dictionary/a-pharmacocybernetics-approach-to-patient-safety/39151>

<https://hitconsultant.net/2022/09/26/digiceuticals-driving-growth-through-digital-health-services/>



Pharmacy Informatics

What is the difference between
pharmacy informatics and
pharmacoinformatics?

Contact

[linkedin.com/in/barry-mcclain-a2081825](https://www.linkedin.com/in/barry-mcclain-a2081825)

barrymcclainrx@gmail.com

<https://www.pharmacyinformatics.net>

