Pharmacogenomics

These resources may be helpful to utilize as reading material for learners and in developing didactic or experiential curricular. Each cited article provides background information on pharmacogenomics and its integration in pharmacy education.

E1. Pharmacists should advance the use of pharmacogenomic information for personalized medication treatment.

Learner Resources

ASHP Pharmacogenomics Resource Center
- This ASHP Resource Center is an area for pharmacists to obtain additional information and resources about pharmacogenomics and related topics. This resource center is managed by the Section of Clinical Specialists and Scientists Advisory Group on Emerging Sciences.


Clinical Pharmacogenetics Implementation Consortium (CPIC) Guidelines
- Detailed gene-drug pharmacogenetic clinical practice guidelines designed to help clinicians understand how available genetic test results should be interpreted and utilized to guide drug therapy

CDC Public Health Genomics and Precision Health Knowledge Base (PHGKB)
- Online, continuously updated, searchable database of published scientific literature, CDC resources, and other materials that address the translation of genomics and precision health discoveries into improved health care and disease prevention.

FDA Pharmacogenomic Biomarkers in Drug Labeling Table
- The website lists therapeutic products from Drugs at FDA with pharmacogenomic information found in the drug labeling.

Inclusion in Pharmacy Didactic Curriculum

- Commentary on best practices in advancing pharmacogenomics in pharmacy education

- Introduction of modern, fast-throughput genotyping technologies in the academic process facilitated comprehension of the potential that pharmacogenomics holds for pharmacy practice
- Impact of a curricular revision, with implementation of a new pharmacogenomics course with a series of active learning activities in the P1 year, rather than later in the curriculum.

- An active-learning laboratory session to teach pharmacy students about clinical pharmacogenetics improved students’ knowledge, confidence, and skills.

- Implementation of personal genomic testing in the second year of the core pharmacy curriculum was feasible, well-received, and enhanced student learning of pharmacogenomics.

- Novel pedagogy that involved voluntarily individual pharmacogenomics testing was beneficial to student pharmacists by improving knowledge, interest, and confidence in pharmacogenomics and its incorporation into their future pharmacy practice.

- Pharmacogenomic course design that included genetic-based didactic sessions, genomic techniques and self-genotype/phenotype laboratory exercise, and clinical-based case studies. Student learning assessment included knowledge and application based tests and performance on a group project.

Munson A, Pierce R. Flipping Content to Improve Student Examination Performance in a Pharmacogenomics Course. American Journal of Pharmaceutical Education 2015; 79 (7): 103. DOI: 10.5688/ajpe797103
- The flipped class instructional model in this project included active-learning activities and formative assessments that provided students spaced and repetitive curricular engagement

- Exploration of the benefits of a six-week APPE course that involved laboratory-based genomic testing, use of personal commercial genomic testing, and incorporated interactions with practicing pharmacists and a genetic counselor. Builds upon a required first-year didactic course entitled “Principles of Genetics and Genomics.”

- Use of a web-based, train-the-trainer program in pharmacogenomics resulted in faculty participants with more confidence in teaching pharmacogenomics to their students.


- Review of laboratory-based genotyping exercises and interprofessional pharmacogenomics activities that could be utilized within pharmacy curriculum.


- First randomized study aimed at assessing the efficacy of personal genomic educational testing in the PharmD classroom


- Incorporation of pharmacogenomic content in undergraduate pre-requisite coursework


- This study demonstrated that a shared curriculum is an effective approach for broadscale curricular dissemination of complex, rapidly evolving content.


- Commentary regarding the challenges connecting pharmacogenomics taught in classrooms and translating it to advance pharmacy practice rotations and healthcare settings and potential areas of development.


- This article describes the development and evaluation of a PGx primer course designed for first professional year pharmacy students.


- Commentary on the importance of genetics in prerequisite courses, integration into PharmD curriculum, PharmD school dedication to pharmacogenomic research, and recruitment of faculty with pharmacogenomic training.
Inclusion in Pharmacy Experiential Curriculum


- Survey highlights that only a small number of US pharmacy schools (40% in 2020) offer an APPE with a primary focus in pharmacogenomics.


- Newly implemented warfarin pharmacogenetics service in a hospital setting, staffed by P1-P3 students on elective independent studies, P4 students on APPE rotations, pharmacy residents, and pharmacy fellows.