

## **Personal PGx analysis for all first-year PharmD students: A foundation for guided implementation.**

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**Introduction:** Future pharmacists will use pharmacogenomic (PGx) analysis to accurately predict personalized response to drugs. Therefore, knowledge of one's own PGx profile should serve to guide the education of pharmacy students. Beginning in Fall 2018, PGx testing has been given free of charge to all students in the first year PharmD class at our college. This early immersion promotes student familiarity with and the use of PGx in clinical pharmacy courses in the final three years of training, such as Pharmacokinetics, Cardiology, Neuropharmacology and Oncology.

**Methods:** All interactions were approved by the ETSU IRB. Using online forms, first semester students are first asked to give consent. Then, if they choose to participate, they complete a thorough pre-analysis survey of academic preparation and personal understanding of genomic testing. Cheek swabs are collected in a group laboratory exercise in the first month of the Fall semester for processing, now using OneOme RightMed kits. Subsequently, 10 classroom lectures are given on PGx in the Pharmaceutical Biochemistry course, including properties of the Human Genome Project, CYP enzymes and drug-specific applications such as codeine and CYP2D6. Near the end of the same Fall semester, a second lab session is held to ensure that all students have inspected their profiles and begun to interpret their results. Included is a guide to the genes analyzed and information on how the testing is performed. Students then complete a post-analysis survey on efficacy of the program.

**Results:** In Fall 2018, there were 81 participants; in Fall 2019, 71, for a total of 152; post-survey participation was only  $\approx 67\%$ . Pre-survey responses showed a wide range of academic background and varied prior experience with genomics, but a strong common interest in PGx. Post-analysis responses also indicated interest in increasing time devoted to PGx in the curriculum. Early exposure therefore is important as a foundation in further education. A personal PGx profile is a unifying tool to use in training in the classroom, lab and clinic. Importantly, this personalization helps students visualize how patients would see and react to this data. Applying PGx analysis and research in the training of future pharmacists is essential. This immersion will significantly stimulate the curriculum at BGCOP. New lectures in the PK course and clinical exercises in Neuropharmacology, Cardiology and Oncology are now being based on this central theme.

**Conclusion:** Exposing first-year pharmacy students to early and inclusive PGx analysis creates a unique common foundation for both faculty and students in this exciting area. The results carry forward through subsequent clinical training.

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