



# PEMED 2018

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## Pharmacogenomics to Pharmaco-omics: Precision Medicine and Drug Response

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**Introduction:** Pharmaco-omics is the study of the role of "omics" science in providing insight into molecular mechanisms involved in individual variation in drug response phenotypes and mechanisms of drug action. Pharmaco-omics has evolved out of pharmacogenomics and involves a continuum from Discovery to Translation to Clinical Implementation.

**Results:** This presentation will describe both the effort of one large, highly integrated academic health center, the Mayo Clinic in the United States, to bring pharmacogenomics to the bedside and to clinically implement this aspect of genomic science that will eventually touch every patient everywhere. It will also, at the other end of the Discovery-Translation-Implementation spectrum, describe the results of pharmaco-omic studies of the selective serotonin reuptake inhibitor (SSRI) therapy of Major Depressive Disorder (MDD) to illustrate the use of pharmacometabolomics to inform pharmacogenomics to identify a series of novel genes that appear to play a role in individual variation in SSRI clinical response. Those genes include ERICH3, TSPAN5, DEFB1 and AHR.

**Conclusions:** This presentation will attempt to illustrate a range of "omics" research and clinical implementation strategies to move toward the goal of truly individualized drug selection and dosing, "Precision Medicine" as applied to drug therapy.

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