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The role of PK/PD and network analysis in the epidemiology of drug-drug interactions

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Pharmacokinetics (PK) and pharmacodynamics (PD) have traditionally played a crucial role in the understanding of drug-drug interactions at a mechanistic level. What is now needed is to integrate PK and PD drug-drug interaction studies with network science. This talk will introduce the use of static and dynamic graph analysis to illustrate a methodology by which network analysis may be used in conjunction with PK and PD studies. Issues such as the polymorphism in enzymes, transporters and receptors will be incorporated into this analysis as well as social networking and genetic variations. In particular, an attempt will be made to address the subject of tipping points and the use of cluster analysis as it relates to the epidemiology of drug-drug interactions. Various examples from the literature will be used to demonstrate the possibilities of network analysis as applied to the epidemiology of drug-drug interactions.

Biography

Ronald R. Burnette obtained his MS in electrical engineering from Stanford University and his Pharm. D. and Ph.D in pharmaceutical chemistry from the University of California San Francisco. He is currently an associate professor of pharmaceutical sciences, vice chair of pharmaceutical sciences and associate dean of faculty affairs at the University of Wisconsin-Madison. He teaches courses in pharmacokinetics, pharmacodynamics, toxicokinetics, and drug interactions to both pharmacy students, graduate students as well as to pharmaceutical scientists in a wide variety of industrial settings.