

Preface to the special issue to honor Gerhard Levy and 50 years of PK/PD

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In a reflection published in *The Annals of Pharmacotherapy* in 2006 [1] Gerhard Levy (known to his friends as Gary) defined pharmacodynamics (PD) as being concerned “with the quantitative, temporal aspects of drug action, and particularly with the relationship between the concentration of drugs (and their active metabolites) in plasma or other biologic fluids and the intensity and time course of their pharmacological effects”.

When one types in the search word “pharmacodynamics” in the PubMed database, over 5.5 million citations dating back to 1873 were found [2]. Obviously, many of the older citations did not report studies that would fit into the definition of PD given above, because the quantitative aspects of the field did not begin until the 1960s when Gary and his students published their seminal articles that described the mathematical relationships between drug concentrations and pharmacological effects [3–5]. With this caveat in mind, in the decade between 2005 and 2014, an average of about 186 thousand records that included the pharmacodynamics term were indexed in PubMed per year.

Gary’s key publication on the “Kinetics of pharmacological effects” was first presented at the IVth International Congress of Chemotherapy in October 1965 in Washington DC [4]. This and his many subsequent publications provided key insights into the connections between pharmacokinetics, pharmacology, and physiology that evolved into the breadth of pharmacodynamic theory, models, methods, and diverse

applications that exist today and utilized in academia, the pharmaceutical industry, and regulatory agencies. With this issue of the *Journal of Pharmacokinetics and Pharmacodynamics*, we mark the 50th anniversary of Gary’s seminal paper and honor his numerous contributions to pharmaceutical sciences and the PK/PD field.

We have invited a number of Gary’s former students and postdoctoral fellows, plus his faculty colleagues at the University at Buffalo, to provide research or review articles in this theme issue. Additionally, we have asked other former students and colleagues of Gary to provide short commentaries on how his work has influenced their own careers and the PK/PD field in general. Our overview of the history and contributions of Gary Levy and these brief commentaries form the first article in this special issue [6].

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