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Advancing pharmacometrics and systems pharmacology.

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The concept that dose differentiates a medicine from a poison is the nucleus from which clinical pharmacology has emerged as a science and practice.[1] This conceptual singularity has provided an organizing principle anchored in quantitative theory that defines the scope of this translational discipline.[2] It has produced the cornerstones of the field, including pharmacokinetics (what the body does to the drug) and pharmacodynamics (what the drug does to the body).[2] Deriving from these core concepts, clinical pharmacology emerged as a discipline largely focused on developing tools and models to define fundamental relationships to predict therapy versus toxicology.[1, 2] From these quantitative underpinnings, the revolution in the new biology, associated with the availability of enabling discovery platforms, in conjunction with the advent of increasingly more sophisticated statistical modeling approaches that deconvolute complex networks of information, offer the next evolutionary step for the discipline.[3, 4] Indeed, innovations in biology, statistics and engineering have provide an opportunity to define the effects of drugs beyond a single molecular target, to their impact on entire systems of integrated signaling networks and biological processes.[5, 6] In turn, systems pharmacology provides higher order dimensionality to drug actions that more precisely informs statistical models predicting concentration-response relationships, defining the framework for the nascent field of pharmacometrics central to enhancing drug development, regulation and utilization.[3, 7-9]

The emergence of systems pharmacology and pharmacometrics as principle quantitative sciences within clinical pharmacology has been associated with the development of highly specialized techniques and approaches in molecular biology, engineering and modeling central to the practice of these subspecialties.[3, 6, 7, 10] Indeed, systems biology provides an emerging platform that integrates complex interactions defining health and disease.[11] Co-application of network medicine and pharmacology science for rational drug discovery and development has offered an unprecedented toolkit propelling most modern efficacy and safety algorithms.[5] Moreover, next generation vocabularies integrate pharmacology, clinical medicine, computer sciences, mathematics, quantitative biology, and systems engineering to communicate

concepts and experimental results that define the vanguard of these fields.[1, 5] In that context, the successful evolution of systems pharmacology and pharmacometrics is predicated on the nurturing of these disciplines. In turn, nurturing requires a forum where these communities can exchange and develop techniques, standards of practice, applications, and innovations, employing the lexicon and applying the concepts that define these subspecialties.

In recognition of the burgeoning importance of pharmacometrics and systems pharmacology to the discipline of clinical pharmacology, the ***American Society for Clinical Pharmacology***, in collaboration with ***Nature Publishing Group*** and ***Clinical Pharmacology and Therapeutics***, has established ***CPT: Pharmacometrics and Systems Pharmacology***. The objective of this open access journal is to create a dedicated forum for the exchange of information essential to the practice of these emerging disciplines. The creation of this journal recognizes the importance of a dedicated venue for the advancement of specialized models, technologies, and concepts forming the frameworks central to these communities of practice. It anticipates a need for public debate and discourse in these fields to catalyze evolution and the development of best practices. Importantly, this journal creates an opportunity for community dialogue employing the specialized lexicon and concepts that at once define these fields and set them apart from other communities of practice within clinical pharmacology

Clinical Pharmacology and Therapeutics welcomes ***CPT: Pharmacometrics and Systems Pharmacology*** as the latest addition to the ASCPT publication family. It is anticipated that these journals will work collaboratively to advance the subspecialties of systems pharmacology and pharmacometrics, and the discipline of clinical pharmacology as a whole. We expect that manuscripts using systems pharmacology or pharmacometrics as tools to define key issues with broad applicability in clinical pharmacology, therapeutics and healthcare will be best suited for publication in ***Clinical Pharmacology and Therapeutics***. Conversely, papers focusing on issues that are the specific province of systems pharmacology or pharmacometrics may be best suited for ***CPT: Pharmacometrics and Systems Pharmacology***. The editorial leadership of the journals, and their editorial boards, will work cooperatively to ensure that the highest quality science is

targeted to the most appropriate audience. Additionally, ***Clinical Pharmacology and Therapeutics*** and ***CPT: Pharmacometrics and Systems Pharmacology*** will work together to enhance the dissemination of advances in clinical pharmacology, systems pharmacology and pharmacometrics through programming at annual meetings and symposia. ***Clinical Pharmacology and Therapeutics*** looks forward to a productive collaboration with ***CPT: Pharmacometrics and Systems Pharmacology*** in this next step in the evolution of the discipline of human therapeutics.

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The authors have no relevant disclosures.

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