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(High Resolution)

### Title: (Title of the abstract must be in sentence case)

*Author & Co-author(s) Name(s)*

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**Abstract:**

Discovery of drug synergy is the mainstream endeavor of pharmacology. The current practice of quantifying the drug synergy based on the concept of Combination Index (CI) has multiple limitations and outdated: it is applicable to a limited pharmacology studies *in vitro* and does not provide a valid statistical significance testing. The latter shortcoming contributes to widespread claim of synergy with laboratory results not confirmed by subsequent clinical trials.

The goal of my talk is to report on the solution of a one hundred years old problem of pharmacology – how to rigorously detect a statistically significant synergy of drugs on all platforms of pharmacological studies *in vitro* and *in vivo*.

I offer statistical models for estimation of synergy using an established definition of Bliss drugs' independence. Although Bliss definition is well-known, it remains a theoretical concept and has never been applied for statistical determination of synergy with various forms of treatment outcome. We rigorously and consistently extend the Bliss definition to detect statistically significant synergy under various designs: (1) *in vitro*, when the outcome of a cell culture experiment with replicates is the proportion of surviving cells for a single dose or multiple doses, (2) dose-response methodology, (3) *in vivo* studies in organisms, when the outcome is a longitudinal measurement such as tumor volume, and (4) clinical studies, when the outcome of treatment is measured by survival. For each design, we developed a specific statistical model and demonstrated how to test for independence, synergy, and antagonism, and compute the associated p-value. All our novel developments are illustrated with preclinical and clinical pharmacological studies. (*up to 300 words)*

**Biography:**

Dr. XXXX received his Ph.D. from Central Institute of Economics & Mathematics, Academy of Sciences, USSR. Since 1992 he works at the Department of Biomedical Data Science, Geisel School of Medicine and Department of Mathematics, Dartmouth College. He is the author of more than 140 peer-reviewed papers and two books in statistics (www.eugened.org). He collaborates with pharmacology and cancer researchers on the regular basis. According to a recently released database by Stanford University, he is among top 2% of World Scientists. His area of interest is pharmaceutics, pharmacology and Drug Delivery. She has published various papers in peer reviewed journals. (*Up to 100-150 words*)

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