

DSS Statistics Seminar

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<https://meet.google.com/ckn-yofc-tbx>

Statistical approaches to cancer drug combination data analysis

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Current cancer treatments are far from optimal. Even when there is a promising initial response, cancer cells easily develop resistance to mono-therapy (the use of a single drug at a time) by activation of compensating pathways. Drug combinations are a viable strategy because they can target cancer cells at multiple locations, possibly preventing the emergence of drug resistance. In this talk, I will introduce the ideas behind drug combinations and present the current state-of-the-art approaches for analyzing drug combination dose-response data, while highlighting their statistical shortcomings. I will illustrate how estimates can be severely biased because of the non-linearity of the commonly employed logistic model. I will use a simple (linear) birth-and-death process to show that current methods fail to capture the intrinsic heteroscedasticity of dose-response data. Finally, I will conclude the talk with possible directions for tackling the problem of statistical testing of drug interactions.



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