

## STATISTICAL DESIGN OF FIELD EXPERIMENTS: CHALLENGES AND SOLUTIONS

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There are a lot of factors influencing the number of patients or item to be included in a controlled clinical trial or experiment. However, the factor with the obvious largest influence is the study design.

Study designs can be classified in 5 design families such as “Between patients design”, “Within patient design”, “Adaptive design”, ”Sequential design” and “Response Surface Pathway design”. The best known and most used designs are probably “Between patient designs”, together with the most central one in “Within patient design”. I will take a look at the strength and the weakness in these design families. The more modern designs in this field are Adaptive designs and Response Surface Pathway designs but also Sequential designs should be more frequently used in combination with others in order to reduce the sample size to a minimum.

In order to show how optimal design methodology might be used to reduce sample size without loss of information, the development of Response Surface Pathway (RSP) design will be presented. Using simulations it can be shown that the number of laboratory animals can be reduced to about 30% of the recommended number without loss in information by this procedure.