

Is it possible to reduce group size or increase power by using mice with high responding microbiota in studies of dermatitis?

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In animal studies power can be increased or group sizes can be reduced by either a decrease in effect size or a decrease in the inter-individual variation. A common model for atopic dermatitis (AD) is induced by oxazolone treatment on the ears, and the expression in this model has been shown to be under strong impact of the composition of the gut microbiota (GM). We, therefore, hypothesized, that the transfer of a GM from high responding mice to germ-free (GF) mice would increase the effect and decrease the inter-individual variation. The mice inoculated with the high responding GM had significantly higher clinical score, increased ear thickness, and increased levels of IL-1 β , TNF α , IL-4, IL-5, and IL-6 compared to mice inoculated with a low responding GM. The inter-individual variation, in general, was not affected by this increase in effect size. Non-inoculated GF mice induced with AD revealed a high disease response as well as high inter-individual variation indicating protective properties of certain microbial taxa. Further studies should be done to show that this increased effect could be further reduced by interventions, which would significantly reduce group sizes, and to identify protecting bacterial species, which would enable the elimination of non-responding mice before inducing the model.