

# BLOOD-BRAIN BARRIER EXPERIMENT

## 14. Final Comments

The goal of the experiment is to test the effectiveness of a new method to disrupt the natural blood-brain barrier. The disruption is crucial in order to allow some medications to reach the brain.

The experiment was conducted on rats. The data collected includes two design variables: sacrifice time and treatment, and several covariates. The response variable defined in the experiment measures the effectiveness of the new method.

We used both multiple regression and general factorial procedure to examine the effects of the design variables and covariates on the response. It was found that both sacrifice time and treatment are highly significant, although there is a weak interaction between the two factors. More precisely, the median ratio of antibody concentration in the brain tumor to antibody concentration in the liver is estimated to be approximately 2.3 times greater for the blood-brain diffusion treatment than for the saline control.

Can we then conclude that the disruption method is effective?

Unfortunately, randomization was not used to assign rats to treatment groups. This raises the possibility that the estimated relationships might be related to confounding variables over which the experimenters had no control. In other words, no cause and effect conclusions can be drawn from the data. Causal implications can only be justified if we assume that the assignment method used had no effect on the response.