Some traditional basics…

- For a design with two experimental groups:
  - Null hypothesis (H0) - there is no statistically significant difference between those experimental groups.
  - Experimental hypothesis (H1) - there **is** a statistically significant difference between two experimental groups.

- We typically reject H0 that if we find that the result of a statistical test comparing the two experimental groups is $p < 0.05$ (also known as the alpha (α) level).

What is significance?

- Suppose that a treatment and a placebo are allocated at random to a group of people. We measure the mean response to each treatment, and wish to know whether or not the observed difference between the means is real (not zero), or whether it could plausibly have arisen by chance. If the result of a significance test is p=0.05, we can make the following statement:

> If there were actually no effect (if the true difference between means were zero) then the probability of observing a value for the difference equal to, or greater than, that actually observed would be p=0.05. In other words there is a 5% chance of seeing a difference at least as big as we have done, by chance alone.