

Physiology of Integrated Organ Function

Statistics	2
Parametric	2
Non-Parametric	2
Non-Normal Data	2
Control Systems	3
Types of Homeostasis Regulation	3
Integration – Cell-to-cell signalling	3
Control Circuits	3
Exercise Physiology	6
Cells and Organs	6
The Cardiovascular System	7
Ventilation	8
Thermal Physiology	11
Heat Balance	11
Fever and Acclimation	13
Thermoregulation – During Exercise	14
Motor Control	15
Sensorimotor Integration and Balance	17
Nociception and Pain	19
Reproductive Endocrinology	21
GnRH	23
Kisspeptin	23
Integrated Physiology	25
Intestinal	25
Circadian Rhythms	26
Obesity and the Respiratory System	27
Ethanol	29

Statistics

Parametric

- Nominal variable – comes in groups like male/female, and the number of groups defines the number of levels
- **Univariate** – variability in one direction i.e. only one measured variable which has random variation
 - Single Factor ANOVA = 1 measured and 1 controlled with many levels
 - T-test works on date with 1 measured and 1 controlled with 2 levels only
 - Summary statistics: Mean \pm SD
 - Two-way ANOVA = used for 2 controlled and 1 measured
 - Number of controlled variables = factors
 - Repeated measures if paired data
- Main effects – 2 controlled variables
- Interaction – was the effect of factor 2 the same on all levels on factor 1??
 - Are the graphs parallel?
- **Bivariate** – variability in two directions i.e. two measured variables
 - Uncontrolled variables
 - Pearson correlation co-efficient (r) – test for association between
 - Hypothesis testing statistic
 - Summary statistic: line of best fit
 - Intercept and slope are the bivariate equivalent to the mean
 - Coefficient of Determination (R^2) – how well line fits data
- Paired t-test = highest power, assumes normal distribution and correlation
- Student's t-test = high power, assumed normal distribution and same SD
 - F-test = tests to see if difference between SD is significant or not
- Welch's t-test = moderate power, assumes normal distribution

Non-Parametric

- DO NOT assume a normal distribution! Assumes measurements are ORDINAL
 - Ignore how much bigger or smaller the value is, look at the rank order only
- Mann-Whitney U-test – equivalent to an unpaired t-test
 - Tells you 1 group mostly has higher ranked members
 - If distributions are the same it tests if the medians are the same
- Wilcoxon signed-rank test (W-test) – equivalent to paired t-test
 - Repeated measures that assumes correlation

Non-Normal Data

- For normal distribution – mean and median are the same
 - if very different, data is not normal