Statistics checklist for manuscripts

Work down the list before you submit. Detailed guide: benchfig.com/en/guide/statistics-checklist/ Version 2026-10-29

Design and n

- [ ] **Defined the experimental unit (n)**
  n = biological replicates (animals, independent cultures, separate experiments). Average technical replicates first
- [ ] **Stated n for each group in the legend or a table**
  Exact n per group, not a range; report exclusions and why
- [ ] **Explained how sample size was chosen**
  Power calculation, or the basis in pilot data or convention
- [ ] **Stated whether allocation was randomised and assessment blinded**
  Essential items in ARRIVE 2.0 for animal studies
- [ ] **Set exclusion and outlier criteria before seeing the data**
  Report the criteria and how many were excluded

Choice of test

- [ ] **Named the exact test**
  “Welch’s t test” or “paired t test”, not just “t test”
- [ ] **Stated one- or two-sided**
  Two-sided is the default
- [ ] **Chose paired vs unpaired correctly**
  Before/after or left/right in the same subject is paired
- [ ] **Addressed assumptions (normality, equal spread)**
  Or explained why a nonparametric test was used
- [ ] **Used ANOVA (or Kruskal–Wallis) plus multiple comparisons for 3+ groups**
  Not repeated t tests. Name the correction (Tukey, Dunnett, Dunn…) and which pairs were compared
- [ ] **Stated the significance level**
  e.g. $P < 0.05$ was considered significant

Numbers in the results

- [ ] **Reported exact P values**
  $P = 0.012$; use $P < 0.001$ only for very small values
- [ ] **Said whether values are mean ± SD, mean ± SEM or median (IQR)**
  Always say what follows “±”
- [ ] **Gave effect sizes with 95% confidence intervals**
  Differences, ratios, correlation coefficients… not P values alone
- [ ] **Gave the test statistic and degrees of freedom**
  Required by many journals, e.g. $t(10) = 3.98$, $F(2, 12) = 9.43$

Figures

- [ ] **Defined the error bars in the legend**
  SD, SEM or 95% CI
- [ ] **Showed individual data points when n is small**
  Bars alone hide the distribution (Weissgerber et al. 2015)
- [ ] **Defined the asterisks and named the test in the legend**
  e.g. *P < 0.05, **P < 0.01 (Tukey’s multiple comparisons)
- [ ] **Started bar-graph axes at zero**
  Make log or broken axes obvious
- [ ] **Checked the journal’s figure rules (width, resolution, font size)**

Methods

- [ ] **Named the software and version**
  e.g. BenchFig 1.4, R 4.4, GraphPad Prism 10
- [ ] **Stated how data can be accessed**
  Data availability statement as the journal requires

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