# Assessing research paper quality

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| Aspect | Weak | Good | Very good | Outstanding |
| Novelty | Reproduces a particular biological finding in a new species. | Demonstrates a small (incremental) advance in knowledge about a specific biological process. | An important new finding | Opens up a new area of research or overturns an existing dogma |
| Interest | Limited value | Important to a small niche (e.g. Non-photochemical quenching) | Will be read by many scientists within a broad discipline (e.g. Plant Science) | Important implications for society or health.  Of broad interest (i.e. a fundamental biological process that is relevant to multiple domains of life such as the function of the ATP synthase) |
| Soundness | Methods incomplete or poorly written  Data not provided  Insufficient replication of findings  No (or incorrect) statistical analysis performed | Methods are complete (including duration and parameter values) so authors can make an attempt at repeating the experiments.  Statistical significance is calculated  Processed data files are provided | All reagents, and strains are listed. Program and data versions provided  All raw data deposited in a permanent repository | Links to extended protocols provided  All code deposited in a permanent repository with a docker implementation, extensive documentation and toy datasets  Unit level data provided  Randomized design was used in experiments  Sample size calculations performed  Findings verified by multiple different approaches |
| Ethics | Unethical study  Plagiarized results  Fake Data | Study has no ethical violations  Data is honestly provided and new |  | Full ethical approval provided by a recognised committee which is named along with the guidelines followed |
| Writing and presentation | Poor grammar, spelling  Long and rambling, hard to follow  Text in inappropriate location  Discussion simply repeats the results  No analysis provided  No insight provided  Soft or no conclusions  Insufficient detail or does not describe data properly  Uses incorrect references or omits key papers  Only references own work  No or incorrect labelling of figures and tables  Text too small to see in figures  Colors a problematic for colorblind individuals | Has a logical flow  Cites relevant references and puts work in context of previous findings  All text and figures properly labelled  Provides sound arguments and solid conclusions  Follows journal guidelines (a bit hard to assess in a preprint!) | Concise writing  Nuanced, water-tight, arguments presented  Very firm conclusions | No unnecessary phrases  Written in an accessible manner, so can be read by a general science audience  Marshals data to provide brilliant insight into a biological question  Draws references from multiple disciplines  Excellent visual presentation of figures that clearly demonstrate points |