How to Produce a Good Research Paper

Dr Gisli Jenkins

General Research Principles

- Know what you want to do BEFORE you do it
- Know WHY what you want to do is IMPORTANT
- Explain EXACTLY what you did
  - Transparency is the key to quality (Fosang and Colbran JBC 2015)
- Describe ALL your data
- Discuss your results in the context of PREVIOUSLY PUBLISHED data
- DO NOT OVERINTERPRET your data

General Writing Principles

- Choose a Journal with the appropriate scope and priorities for your manuscript
- Brevity and clarity
- Avoid unnecessary use of words
- Consider getting help with the English because it may make it easier for Editors and Reviewers to understand crucial points

Thorax Scope

- Seek to publish significant advances in scientific understanding, which are likely to impact on clinical practice.
- Clinical topics include respiratory medicine, sleep and critical care
- Basic and translational mechanisms with application to clinical material (e.g cell and molecular biology, genetics, epidemiology, and immunology)
- Paediatric to adults medicine
- Original papers, systematic reviews and meta-analyses as well as narrative reviews and education content

Types of Manuscript

1. Original Research – direct submission
2. Research Letters – direct submission
3. Case Base Discussions/Images – direct submission
4. Narrative Reviews – invited/direct submission
5. Editorials - invited
6. Educational content - invited

The Abstract – 250 words

Annotated example taken from *Nature* 435, 114–118 (5 May 2005).

One or two sentences providing a **basic introduction** to the field, comprehensible to a scientist in any discipline.

Two to three sentences of **more detailed background**, comprehensible to scientists in related disciplines.

One sentence clearly stating the **general problem** being addressed by this particular study.

One sentence summarizing the main result (with the words "**here we show**" or their equivalent).

Two or three sentences explaining what the **main result** reveals in direct comparison to what was thought to be the case previously, or how the main result adds to previous knowledge.

One or two sentences to put the results into a more **general context**.

Two or three sentences to provide a **broader perspective**, readily comprehensible to a scientist in any discipline, may be included in the first paragraph if the editor considers that the accessibility of the paper is significantly enhanced by their inclusion. Under these circumstances, the length of the paragraph can be up to 300 words. (This example is 190 words without the final section, and 250 words with it).

During cell division, mitotic spindles are assembled by microtubule-based motor proteins[1,2]. The bipolar organization of spindles is essential for proper segregation of chromosomes, and requires plus-end-directed homotetrameric motor proteins of the widely conserved kinesin-5 (BimC) family[3]. Hypotheses for bipolar spindle formation include the 'push–pull mitotic muscle' model, in which kinesin-5 and opposing motor proteins act between overlapping microtubules[3,4,5]. However, the precise roles of kinesin-5 during this process are unknown. Here we show that the vertebrate kinesin-5 Eg5 drives the sliding of microtubules depending on their relative orientation. We found in controlled *in vitro* assays that Eg5 has the remarkable capability of simultaneously moving at ~20 nm s^{-1} towards the plus-ends of each of the two microtubules it crosslinks. For anti-parallel microtubules, this results in relative sliding at ~40 nm s^{-1}, comparable to spindle pole separation rates *in vivo*[6]. Furthermore, we found that Eg5 can tether microtubule plus-ends, suggesting an additional microtubule-binding mode for Eg5. Our results demonstrate how members of the kinesin-5 family are likely to function in mitosis, pushing apart interpolar microtubules as well as recruiting microtubules into bundles that are subsequently polarized by relative sliding. We anticipate our assay to be a starting point for more sophisticated *in vitro* models of mitotic spindles. For example, the individual and combined action of multiple mitotic motors could be tested, including minus-end-directed motors opposing Eg5 motility. Furthermore, Eg5 inhibition is a major target of anti-cancer drug development, and a well-defined and quantitative assay for motor function will be relevant for such developments.

The Manuscript

- Introduction
  - Approx four paragraphs to state why you did what you did
- Methods
  - Very important, make sure match reporting guidelines and protocols
- Results
  - Two figures/tables Research Letter
  - More than four figures/tables Original Manuscript
- Discussion
  - Avoid over interpretation
- Word Limits
  - 3500 words Original Manuscript
  - 1000 words Research Letter
- Supplementary Material
  - Supporting data for letters and original manuscripts

Basic Science

- High quality basic science research.
- Statistical analyses must be carried out on all available data and not just on data from a representative experiment.
- Statistics and error bars should only be shown for independent experiments and not for replicates within a single experiment. Cumming et al., J. Cell Biol. 177:7–11.
- All animal studies must conform to the ARRIVE guidelines.
- We will give priority to manuscripts that have submitted pre-analysis plans and clearly state where materials can be accessed.

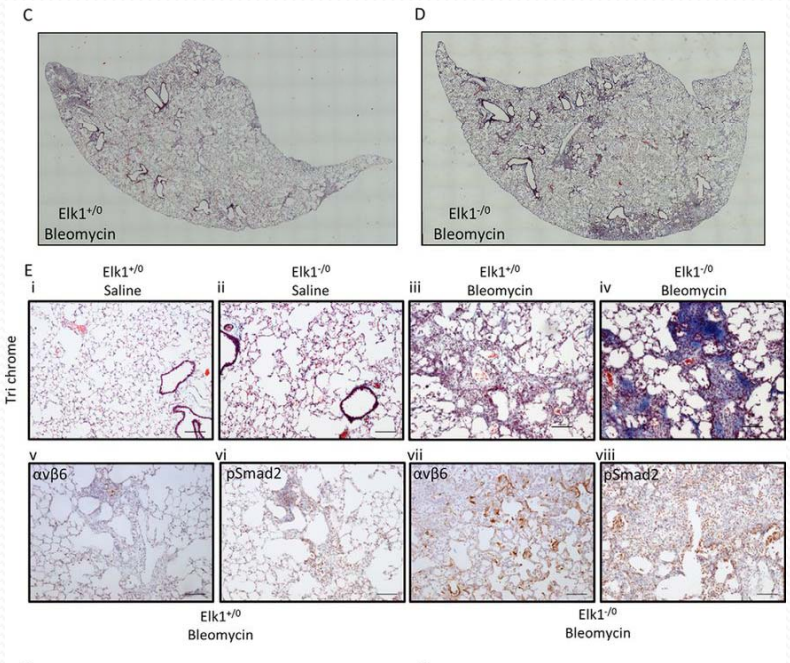
National Institutes of Health
Turning Discovery Into Health

- Principles and Guidelines for Reporting Preclinical Research workshop 2014
  - Standards (ARRIVE)
  - Replicates (Technical versus experimental)
  - Statistics
  - Randomization
  - Blinding
  - Sample-size estimation (Power calculation)
  - Inclusion and Exclusion criteria
  - Data and Material Sharing

Images

- *No specific feature within an image may be enhanced, obscured, moved, removed, or introduced.*

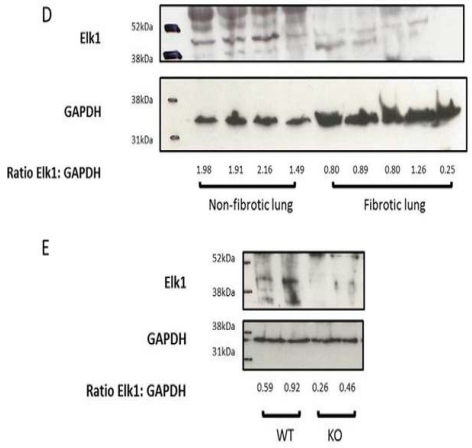
- Immunohistochemistry
  - MinPEPA guidelines (Scudamore et al J Pathol 201)
  - CLIP principles (Lang et al Chest 2012)
  - Avoid cherry picking



Tatler et al. J. Biol. Chem. 2016;291:9540-9553

Immunoblots

- Western blots
  - Immunoblots should be cropped in a way that retains information about antigen size and antibody specificity.
  - The cropped images should retain sufficient area around the band(s) of interest, ideally including the positions of at least one molecular weight marker above and below the band(s).
  - Do not assemble immunoblot figures by splicing lanes from different sections of a gel. If blots must be spliced, borders between separate sections must be clearly marked and explained in the figure legend.



Tatler et al. J. Biol. Chem. 2016;291:9540-9553

Observational Clinical Studies

- We will consider retrospective, prospective and registry based observational studies.
- Priority will be given to those studies where the hypothesis and study protocol have been made publicly available (eg on Clinicaltrials.gov or on an institutional website) before the study began.
- Retrospective observational studies which derive a scoring system (eg prognostic or diagnostic score) or evaluate a biomarker should have both a training and a validation cohort.
- Where these studies do not have a validation cohort they will be considered for publication as a research letter only.
- For observational research, priority will be given to large prospective studies.
- Epidemiological studies must follow STROBE guidelines (or STEGA guidelines for genetic association studies).

Randomised Controlled Trials

- The clinical trial protocol must have been publicly available before the trial commenced (eg on clinicaltrials.gov or ISRCTN).
- The trial must have appropriate ethical approval and must be reported according to the CONSORT guidelines.
- If investigators wish to submit their final protocol, we offer peer review (for details see 'Clinical Trial and Systematic Review Protocols' on our Instructions for Authors).

Systematic Reviews

- Systematic reviews should be reported according to the PRISMA guidelines.
- The protocol for the review must have been publicly available before the review commenced (eg on the Cochrane Library or on PROSPERO).
- Systematic reviews of epidemiological studies should be reported in accordance with the MOOSE guidelines (Meta-analysis of Observational Studies in Epidemiology).

Language Polishing

- If you are not a native English speaker, we recommend that you have your manuscript edited by a native speaker prior to submission.
- Professional editing will improve the grammar, spelling and punctuation of your manuscript, providing clear language that will mean reviewers and editors are better able to concentrate on the scientific content of the paper.

One line summaries

- What is the key question?
- What is the bottom line?
- Why read on?

- 140 Character count Twitter feed

Plagiarism Detection

- BMJ is a member of CrossCheck by CrossRef and iThenticate.
- iThenticate is a plagiarism screening service that verifies the originality of content submitted before publication.
- iThenticate checks submissions against millions of published research papers, and billions of web content.
- Authors, researchers and freelancers can also use iThenticate to screen their work before submission by visiting www.ithenticate.com.

Summary

- The Abstract is CRUCIAL
- Read the Instructions for Authors
- Prospective Studies get priority
- Discovery with Validation data sets get priority
- Describe everything you will do, register it and then do it.
- Describe all the data you obtain in line with reporting guidelines
- Language polishing services and plagarism software are available.

Thank you


ON THE ROAD TO SUCCESS,
THERE ARE NO SHORTCUTS.
JOIN OUR TEAM
SHAFFER
TRUCKING
OUR MOST
VALUABLE
RESOURCE SITS
63 FEET AHEAD.
C240