Part of SPRINGER NATURE

Illustration inspired by the work of Dorothy Hodgkin

How to write an authoritative review?

Ursula Hofer

Nature Reviews Microbiology

15 April 2019

nature research

How to write an authoritative review?

authoritative /ɔːˈθɒrɪtətɪv,ɔːˈθɒrɪˌteɪtɪv/

- able to be **trusted** as being accurate or true; reliable
- (of a text) considered to be the **best of its kind** and unlikely to be improved upon
- commanding and self-confident; likely to be **respected** and obeyed
- proceeding from an official source and requiring compliance or obedience

Best practices for writing a review

… at *Nature Reviews*

nature research

- ~50 Reviews per year
- Covers all of microbiology from archaea to apicomplexa, from biofilms to bioreactors and from clinical diagnostics to carbon cycles
- ~90% commissioned
- Small team of professional editors

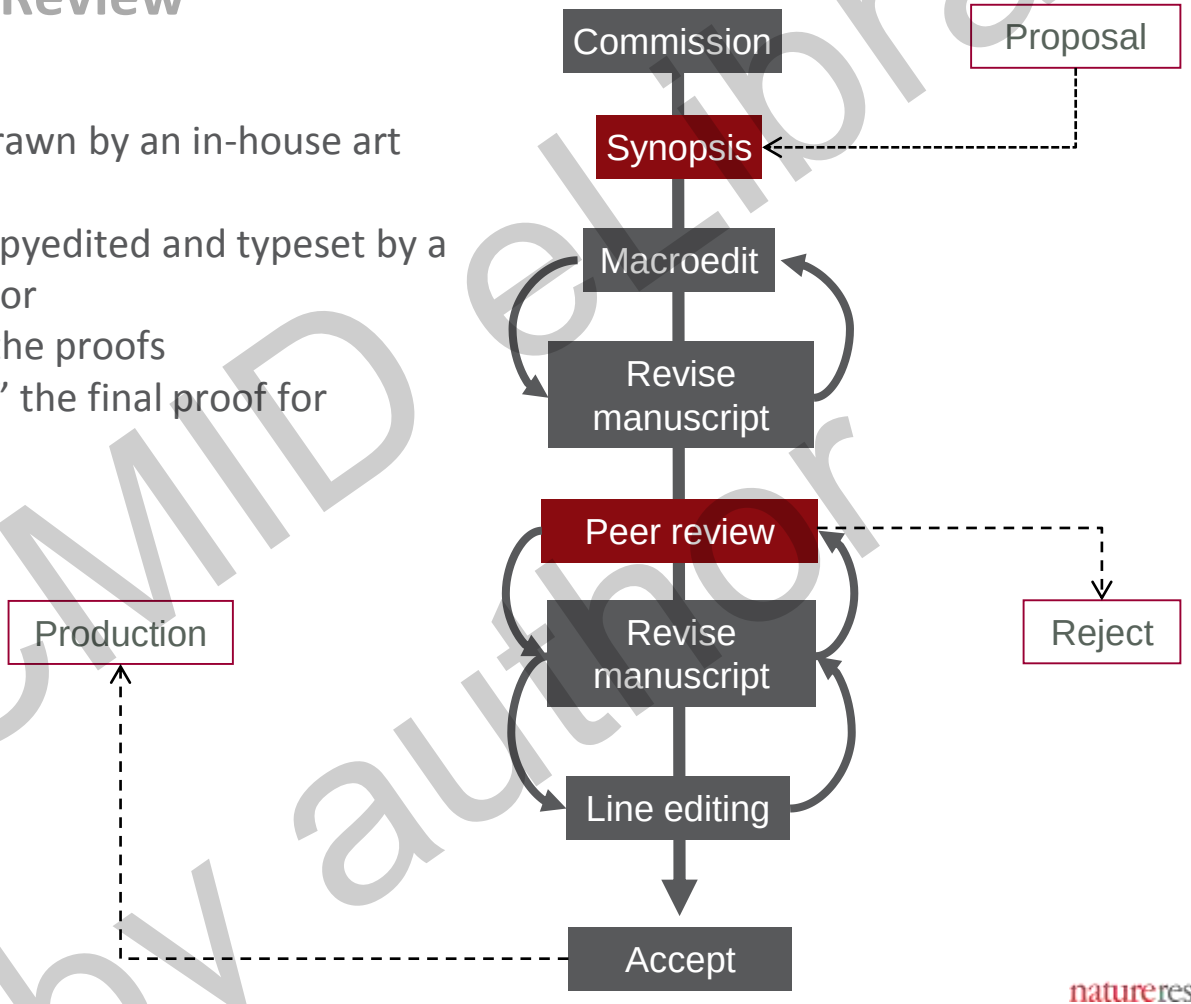
Ursula Hofer MD PhD
Chief Editor

Andrea Du Toit PhD
Senior Editor

Ashley York DPhil
Senior Editor

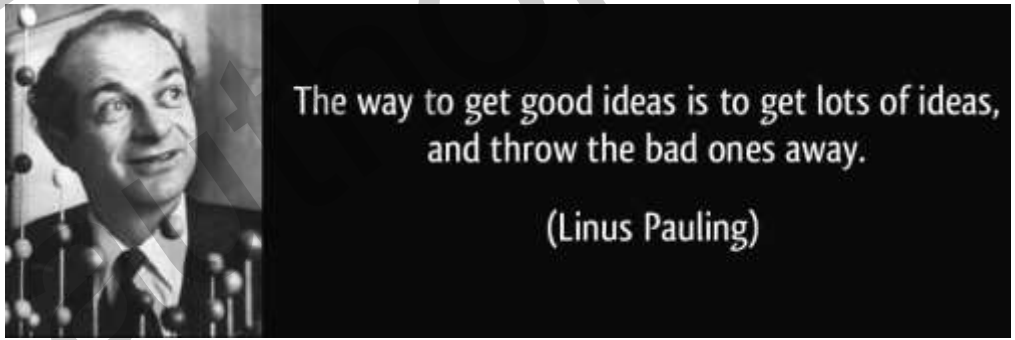
The life of a Review

- Figures are redrawn by an in-house art editor
- The article is copyedited and typeset by a production editor
- Author checks the proofs
- Editor ‘signs off’ the final proof for publication



Commissioning

- Current hot topics (and likely future hot topics)
- Topics that require an update
- Controversies and open questions
- Timing
- Overlap
- Scope
- Author



Synopsis

- Title
- Rationale
- Subsections and summary of their content
- Display items (figures, tables and boxes)
- Key references

→ **What is the story?**

Macroedit

- Check for plagiarism
- Formalities (length, references, number of display items, authors, conflicts of interest etc)
- Text structure, flow and sense
- Story and insight
- Figures
- Level of detail and explanation, aiming for a ‘general’ microbiology reader

Peer review

- Select referees
- Referees sometimes disagree and some issues are subjective
- The editor's job is to guide the author in terms of which comments are (and are not) essential to address
- Editors discuss and make decisions based on arguments; we don't simply count votes
- Editors, not referees, ultimately decide what is published in all *Nature*-branded journals, and take full responsibility for decisions
- Rejection is rare but does happen

Line edit

bacteria *Bacillus* spp. that use bacillithiol [Au: OK?][22].

[H3] Repair of oxidized Met residues. The repair cue of oxidized Met is carried out by methionine sulfoxide reductases (Msrs), which are found in most living organisms [Au: Insert reference. How is Met-O repaired in the absence of Msrs in the other living organisms?]. In *E. coli*, four cytoplasmic Msrs have been identified, MsrA, MsrB, MsrC (also called free methionine-R-sulfoxide reductase; fRMsr [Au: What exactly is also called fRMsr? MsrC only?]) and biotin sulfoxide reductase (BisC) (also known as the biotin sulfoxide reductase).[23–27] While MsrA and MsrB can reduce both free Met-O and Met-O in proteins, whereas act both on protein-bound and free Met-O, BisC and MsrC can only only act on reduce free Met-O. MsrA and MsrB share a similar phylogeny, which may explain their shared substrate specificity[28,29]. [Au: Is it possible to comment here on the (perhaps distant?) phylogeny of MsrA/MsrB and MsrC/BisC and how this may explain the different substrate specificities?] MsrA and MsrB share a nearly identical phylogenetic profile, which supports their functional link.[28,29].

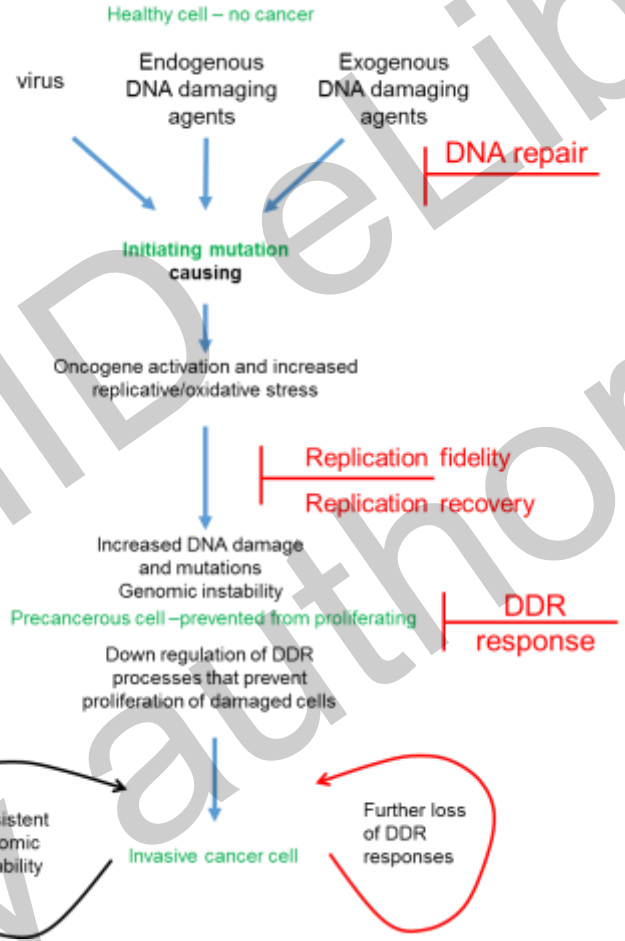
Canonical Most Msrs have exhibit a strict stereospecificity for their substrates, for example, MsrA enzymes [Au: OK?] is reduce act on Met-(*S*)-O, whereas while MsrB enzymes reduce act on Met-(*R*)-O.[25,60,61] [Au: Edit OK?]. As a consequence, the full repair of an oxidized protein requires the concurrent action of both MsrA and MsrB (Fig. 3A). Despite sharing neither structural nor sequence similarity structural and sequence dissimilarities, between MsrA and MsrB, they both use possess a similar catalytic mechanism of Met-O reduction [Au: OK?].[62–65] In the first step, a nucleophilic Cys residue [Au: OK?] (Cys_A) attacks a Met-O substrate, which leading to the formation of a sulfenic acid (-SOH) [Au: OK?] on Cys_A, and the concomitant release of reduced Met [Au: OK?]. In the second step, a recycling nucleophilic Cys (Cys_B) residue attacks Cys_A-SOH, which leading to the formation of an intramolecular disulfide intermediate [Au: OK?], and the release of a water molecule. In the a third step, the intramolecular disulfide intermediate is reduced by a Trx protein and , a catalytically active Msr enzyme is regenerated ing a catalytically active Msr (Fig. 3B). The importance of Trxs in the regeneration of a catalytically active Msr enzyme recycling is shown illustrated by the absence of Msr activity in *E. coli* mutants that lack lacking Trx1 [Au: What is their phenotype? Please clarify.].[66,67]

There are Several similar alternative variations exist around this general catalytic mechanisms that Msrs use to repair oxidized proteins. For example instance, some MsrA enzymes have an additional recycling Cys residue (Cys_C), which attacks the Cys_A-Cys_B disulfide bond and, leading to the formation of a Cys_A-Cys_C disulfide, which is then eventually reduced by Trx.[68] Alternatively In addition, a some few MsrB enzymes have just only one catalytic Cys.[69] For these enzymes, it remains unclear as to how the sulfenic acid is reduced *in vivo*. Regardless of the catalytic mechanism used by Msr type of Msrs, the rate-limiting step appears seems to be the Trx-recycling dependent regeneration of the a catalytically active enzyme process [Au: Why only 'seems to be' rate limiting? was it measured? Please clarify.].[68] Notably Of note, some a few Msrs, mostly found in eukaryotes, possess have a selenocysteine (Sec) instead of a Cys as the catalytic residue.[68] [Au: What is the significance of this? please clarify.].

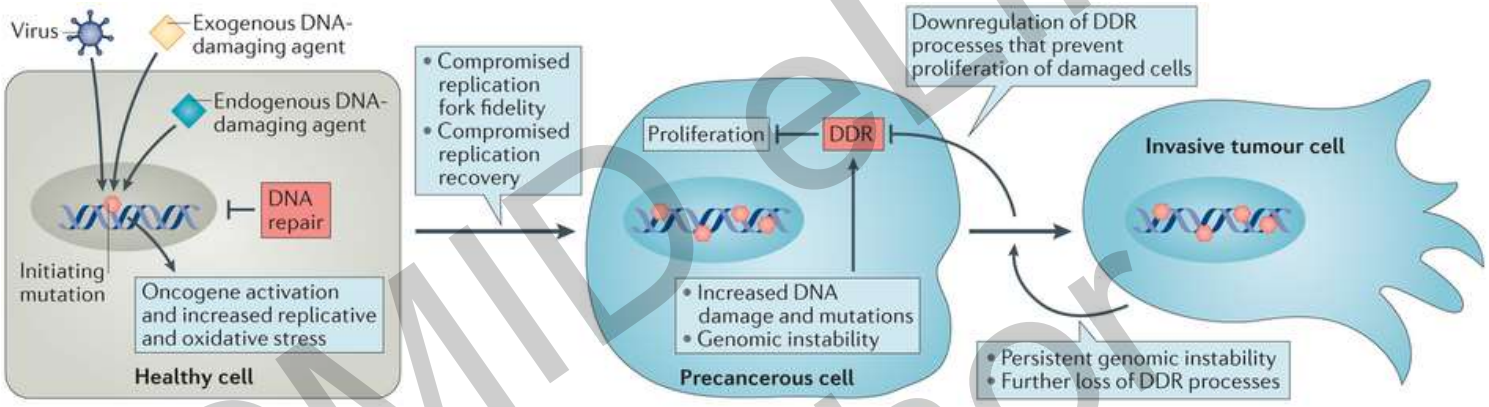
Structures of the oxidized and reduced forms of MsrA and MsrB from different sources [Au: species? what were the sources?] were have been solved, which provided insights into the molecular mechanisms of their catalytic cycles obtained. The three-dimensional structure of MsrA revealed an has an α/β roll domain conformation [Au: OK?], in which Cys_A is surrounded by strictly conserved amino acids that forming a large basin that adapted to the binding sing of bulky protein substrates.[69,70] The three-dimensional structure of MsrB revealed consists of two antiparallel ββ-sheets that form a β-barrel [Au: OK?] structure shape, which is surrounded by α-helices. The three-dimensional structure also revealed that the active site, which formed by three regions of conserved residues, is located in a surface-exposed pocket on the exterior of the β-barrel active site is in a surface-exposed pocket located outside of the barrel and defined by three regions of conserved sequences [Au: Edit OK?].[51,52] For In most MsrB enzymes proteins, the catalytic and recycling Cys residues are located within the surface-exposed this pocket. Interestingly, cComparison of the active sites from the structures of in MsrA and MsrB revealed that they are mirror-like versions images of each other. For both In MsrA and MsrB active sites, despite being on opposite sites of the β-barrel, both sites, but on opposite sides, a tryptophan interacts with the terminal a [Au: Is the epsilon necessary, if the CH3 is terminal? If so, I suggest writing "a tryptophan interacts with the terminal methyl in the epsilon position"] methyl group of Met-O, while hydrogen bonds partners interact form with the oxygen O atom [Au: What is the significance of this? A lot of molecular detail is given here, but the message is unclear.].[51,52]

A wide series of number of proteins have been found to have were to be oxidized on Met residues when exposed after exposure to oxidants. These proteins include a catalase and a peroxidase from *Helicobacter pylori*,[52,54] and molecular chaperones from *E. coli* and

Figures — from this...



… to this



Some tips and tricks

The ABC of writing style

a accurate

- Be specific
- Provide sufficient information

b brief

- Keep to the point
- Avoid redundancy

c clear

- Break up long sentences
- Use simple words
- Active voice

Bad practice

- Hyperbole (pioneering, amazing, innovative, paradigm shift)
- Passive voice
- Long, complicated sentences
- Complicated words (utilize)
- Overused or unspecific words and phrases (framework, influence)

Title: draw the reader in

- Make the **main message** of the article clear
- Be **descriptive** but not too detailed
- Avoid **jargon** and acronyms
- Include **keywords** to enhance discoverability
- Be wary of using **punctuation** in titles, especially question marks

The problem with questions

- The question suggests a lack of definite answer
- A 2011 study revealed titles with a '?' tended to be downloaded more but cited less (n=2172 articles)

BIOLOGY OF REPRODUCTION 48, 133–142 (1993)

How Does Daily Treatment with Human Chorionic Gonadotropin Induce Superovulation in the Cyclic Hamster?[1]

GILBERT S. GREENWALD[3]

Avoid puns

- Can be invisible to web searches
- Not usually very helpful
- Usually funniest to the authors…

Knockin' on pollen's door: live cell imaging of early polarization events in germinating Arabidopsis pollen

Frank Vogler[1], *Sebastian S. A. Konrad*[2] *and Stefanie Sprunck*[1]*

[1] *Cell Biology and Plant Biochemistry, Biochemie-Zentrum Regensburg, University of Regensburg, Regensburg Germany;*
[2] *Faculty of Biology, Institute of Genetics, Ludwig-Maximilians-University of Munich, Martinsried, Germany*

Like a rolling stone: Naturalistic visual kinematics facilitate tracking eye movements

Journal of Vision (2013) 13(2):9, 1–12 **David Souto** **Dirk Kerzel**

The abstract: your ‘mini Review’

Do

- Make the **story** you are telling clear
- Summarize the most **important points**
- Note the **relevance and implications**
- Include **keywords**

Don’t

- Just **copy paste** from the main text
- Use **uncommon abbreviations** and acronyms
- Provide too much **detail**

The introduction: setting the stage

- Introduce the **question**
- **Set the background**, and do not assume knowledge
- Be selective, but scholarly, with **citations**
- Summarize the **scope** succinctly

Main text

- Order sections **logically**, not chronologically
- Focus one **one main idea** in each sections
- Use headings to **guide the reader** through the story
- Use **introductory and concluding sentences** for sections and paragraphs

Figures: your ideas on display

- Aim for **one figure** for each main section
- Make sure they are **clear** and understandable
- Keep them **focused**: a single concept
- Use **schematics** for complex ideas or mechanisms
- Use **colour and symbols** consistently

Conclusions: bringing it all together

- Conclusions are **not a summary** of the article
- Explain how our **understanding** has been advanced
- Discuss the **importance and implications**
- Point to **future directions**
- Ask yourself **so what?** — the answer is the conclusion to the review

Please bear in mind…

- Writing a review takes time to do well
- Plan overall structure and order of ideas first
- Write in stages (write, sleep on it, re-read and edit)
- Read it aloud
- Ask a colleague to read and offer honest view

If you remember one thing…

How to write an ~~authoritative~~ review? ✗

Titles matter!

Thank you

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@NatureRevMicro

ursula.hofer1@nature.com

The story behind the image

Dorothy Hodgkin (1910–1994)

Dorothy Hodgkin pioneered the application of x-ray crystallography techniques to determine the three-dimensional structure of biomolecules, helping to unravel how their atomic arrangements influence how they work in the body. She remains the only British woman scientist to have been awarded the Nobel Prize for Chemistry.

nature research