# Writing exercise S11: Titles and Subtitles

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### A rose by any other name…

Good titles are descriptive, focused, and help to guide the reader’s attention, so that they know what to expect in the coming passage(s). They are also as succinct as possible (see Writing Exercise C02 – omit needless words).

Sometimes (perhaps particularly in older literature, but sometimes in more modern papers as well), you will encounter titles that are rather vague (e.g., “Studies on the mechanism of action of isocitric dehydrogenase”1, or “Observations concerning the presence of isocitric dehydrogenase in mitochondria”2). While these do give some indication of the topic of the paper, a more precise and focussed title would be better (e.g., “Isocitrate dehydrogenase mutation in *Vibrio anguillarum* results in virulence attenuation and immunoprotection in rainbow trout (*Oncorhynchus mykiss*)”3). Note how in the last example, we have a much better idea of the topic of the paper and why it is important.

The same rule applies to subtitles used within a paper (and also to figure/title tables). Consider the one of the “Results” subheadings3: “*icd* mutant is highly attenuated for virulence against rainbow trout”. Rather than just being told that we should expect “Results” – which is vague and unhelpful – we as readers are guided to a more precise understanding of the contents of this section of the paper.

Ideally, a good title should also help the reader to be excited about the paper they are going to read (usually by conveying a sense of importance, novelty, or interest). In this respect, the more focussed titles (e.g., virulence attenuation in rainbow trout) tend to be better than the vague ones (e.g., studies on/observations concerning….)

### Exercise A.

The following titles have all been taken from published scientific papers. Read each title and ask yourself the following questions:

1. Is this title likely to appeal to readers (make them want to read the paper)? Which readers (specifically) are likely to be interested in reading this paper?
2. Is the title specific and focussed, giving a very precise indication of what the paper is going to be about?
3. Can you suggest any way(s) in which the title could be improved?

**Molecular insights and functional analysis of isocitrate dehydrogenase in two gram-negative pathogenic bacteria**4

**Isocitrate dehydrogenase of *Bacillus cereus* is involved in biofilm formation**5

**Enzymatic characterization and functional implication of two structurally different isocitrate dehydrogenases from *Xylella fastidiosa***6

**From a dimer to a monomer: Construction of a chimeric monomeric isocitrate dehydrogenase**7

### Exercise B.

Draft several potential titles for your own thesis (or subheadings for different sections in your thesis). Evaluate each according to the questions above.

### References

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3. Mou X, Spinard EJ, Hillman SL, Nelson DR. Isocitrate dehydrogenase mutation in *Vibrio anguillarum* results in virulence attenuation and immunoprotection in rainbow trout (*Oncorhynchus mykiss*). *BMC Microbiol*. 2017;17(1):217. Published 2017 Nov 14. doi:10.1186/s12866-017-1124-1
4. Xiong W, Su R, Han X, et al. Molecular insights and functional analysis of isocitrate dehydrogenase in two gram-negative pathogenic bacteria. *World J Microbiol Biotechnol*. 2024;40(11):357. Published 2024 Oct 19. doi:10.1007/s11274-024-04169-7
5. Zhao L, Liu Q, Huang Q, Liu F, Liu H, Wang G. Isocitrate dehydrogenase of *Bacillus cereus* is involved in biofilm formation. *World J Microbiol Biotechnol*. 2021;37(12):207. Published 2021 Nov 1. doi:10.1007/s11274-021-03175-3
6. Lv P, Tang W, Wang P, Cao Z, Zhu G. Enzymatic characterization and functional implication of two structurally different isocitrate dehydrogenases from *Xylella fastidiosa*. *Biotechnol Appl Biochem*. 2018;65(2):230-237. doi:10.1002/bab.1560
7. Tian C, Wen B, Bian M, et al. From a dimer to a monomer: Construction of a chimeric monomeric isocitrate dehydrogenase. *Protein Sci*. 2021;30(12):2396-2407. doi:10.1002/pro.4204