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Thursday, February 9, 2012

### Is Love in the Air? Human Pheromones and Axillary Chemistry

*Dr. George Preti, of the Monell Chemical Senses Center*



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### Top Five Chemistry Tips for the Kitchen

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### Fundamentals of Effective Scientific Writing – Manuscripts and Grants

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## Write Well and Prosper – Science Writing Tips



Kristin Sainani  
Stanford University



David Harwell,  
ACS Careers

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## Example to start...

Dysregulation of physiologic microRNA (miR) activity has been shown to play an important role in tumor initiation and progression, including gliomagenesis. Therefore, molecular species that can regulate miR activity on their target RNAs without affecting the expression of relevant mature miRs may play equally relevant roles in cancer.

From an article in *Cell*

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## Example to start...

Note the use of nouns instead of verbs.

Dysregulation of physiologic microRNA (miR) activity has been shown to play an important role in tumor initiation and progression, including gliomagenesis. Therefore, molecular species that can regulate miR activity on their target RNAs without affecting the expression of relevant mature miRs may play equally relevant roles in cancer.

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## Example to start...

Note the use of vague words.

Dysregulation of physiologic microRNA (miR) activity has been shown to play an important role in tumor initiation and progression, including gliomagenesis. Therefore, molecular species that can regulate miR activity on their target RNAs without affecting the expression of relevant mature miRs may play equally relevant roles in cancer.

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## Example to start...

Note the use of unnecessary jargon and acronyms.

Dysregulation of physiologic microRNA (miR) activity has been shown to play an important role in tumor initiation and progression, including gliomagenesis. Therefore, molecular species that can regulate miR activity on their target RNAs without affecting the expression of relevant mature miRs may play equally relevant roles in cancer.

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## Example to start...

Note the passive voice.

Dysregulation of physiologic microRNA (miR) activity has been shown to play an important role in tumor initiation and progression, including gliomagenesis. Therefore, molecular species that can regulate miR activity on their target RNAs without affecting the expression of relevant mature miRs may play equally relevant roles in cancer.

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## Example to start...

Note the distance between the subject and the main verb of this sentence.

Dysregulation of physiologic microRNA (miR) activity has been shown to play an important role in tumor initiation and progression, including gliomagenesis. Therefore, molecular species that can regulate miR activity on their target RNAs without affecting the expression of relevant mature miRs may play equally relevant roles in cancer.

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## Possible rewrite...

- Changes in microRNA expression play a role in cancer, including glioma. Therefore, events that disrupt microRNAs from binding to their target RNAs may also promote cancer.

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## Outline

- Tips to make your writing stronger.
  - Sentence-level tips
  - Paragraph-level tips
- Tips to make your writing easier.

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## Sentence-level tips

- Write with strong, active verbs
  - Use the active voice (subject-verb-object)
  - Use strong verbs
  - Avoid turning verbs into nouns
  - Don't bury the main verb
- Be specific
- Avoid unnecessary jargon and acronyms
- Get rid of clutter
  - Long words or phrases that could be short, dead-weight words and phrases, repetition, adverbs, negatives

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## Example

Important studies to examine the descriptive epidemiology of autism, including the prevalence and changes in the characteristics of the population over time, have begun.

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## Example

Important studies to examine the descriptive epidemiology of autism, including the prevalence and changes in the characteristics of the population over time, have begun.

Identify the problems...

--where's the verb?

--watch fluff words like "important"

--can changes occur without being "over time"?

-- "of the population" is vague

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## Example

Important studies to examine the descriptive epidemiology of autism, including the prevalence and changes in the characteristics of the population over time, have begun.



Studies have begun to describe the epidemiology of autism, including recent changes in the disorder's prevalence and characteristics.

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## Example

- The activation of  $\text{Ca}^{++}$  channels is induced by the depletion of endoplasmic reticulum  $\text{Ca}^{++}$  stores.



- Depleting  $\text{Ca}^{++}$  from the endoplasmic reticulum activates  $\text{Ca}^{++}$  channels.

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## Paragraph-level tips

- 1 paragraph = 1 idea
- Give away the punch line early.
- Paragraph flow is helped by:
  - logical flow of ideas
  - parallel sentence structures
  - *if necessary*, transition words

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## Example: paragraph

Most scents remain constant in their quality over orders of magnitude of concentration (12). Nevertheless, at high concentrations, quality tends to be negatively correlated with intensity, as was the case, for example, for the cinnamon oil used in this study. Hence, reliability of absolute scorings was achieved by calibrating the amount of perfume ingredients with initial ratings for intensity against a reference substance of known concentration. The final concentrations were in principal chosen in a way such that individual ratings showed variance among participants within the sliding scale between 0 and 10 (meaning that people could decide whether they liked a scent or not). This procedure seemed successful for most scents; however, the concentrations for bergamot (highest average ratings) and vetiver (lowest average rating) could probably been reduced even more, as both scents did not show any discriminating power at the level of common alleles (people agreed largely on the quality of these two scents) (see Table 2). Interestingly, the pooled rare alleles showed discriminating power for...

Word count: 212

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## What's the paragraph trying to convey? (outline)...

I. Were the perfume concentrations in the experiment appropriate?

Main idea of the paragraph

A. If the concentration is too high, the smell may be too overpowering and this may affect quality ratings.

i. This is not a problem here because we standardized intensity.

B. The concentrations are appropriate if they produce sufficient variability in quality ratings.

i. This appeared true for most scents, with two exceptions.

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## Example: paragraph

Perfume quality and intensity may be negatively correlated (if a scent is too strong, most people will reject it independent of their preference). Hence, we chose the final concentration of each perfume ingredient so that it had similar intensity to a reference scent (1-butanol). The resulting concentrations appeared appropriate for most scents, as participants' preferences varied along the sliding scale between 0 and 10. However, people largely agreed on the quality of bergamot (highest average ratings) and vetiver (lowest average rating), so lower concentrations may have been needed for these scents.

Word count: 91

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## Make your writing easier...

**How much time do you spend (proportionally) on each step?**

1. Pre-writing (literature search, brainstorming, organizing ideas)
2. Writing the draft
3. Revising the draft

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## The Writing Process: suggested

### **1. PREWRITE (70%)**

- Collect, synthesize, and organize information
- Brainstorm take-home messages
- Work out ideas away from the computer

### **2. DRAFT (10%)**

- Write complete sentences in order at the computer

### **3. REVISE (20%)**

- Read your work out loud
- Get rid of clutter
- Do a verb check
- Get feedback from others

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## Take-home messages

To make your writing stronger:

1. Write with strong, active verbs.
2. Cut the clutter.
3. Know the purpose of each paragraph.

To make your writing easier:

1. Spend more time pre-writing.
2. Don't be a perfectionist on the first draft.
3. Expect more out of revision.

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## Further resources

- **Books on writing:**
  - *On Writing Well*, William Zinsser
  - *The Elements of Style*, Strunk and White
  - *Sin and Syntax*, Constance Hale
- **Books on scientific writing:**
  - *Essentials of Writing Biomedical Research Papers*, Mimi Zeiger
  - *Scientific Writing: A Reader and Writer's Guide*, Jean-Luc Lebrun
  - *The ACS Style Guide: Effective Communication of Scientific Information*, 3rd ed.
  - *Successful Scientific Writing: A Step-by-Step Guide for the Biological and Medical Sciences*, Matthews and Matthews
- **Articles on scientific writing:**
  - [http://www.aacc.org/publications/dln\\_chem/cogsw/Pages/default.aspx#t](http://www.aacc.org/publications/dln_chem/cogsw/Pages/default.aspx#t)
- **Tips from journals:**
  - [http://www.nature.com/authors/author\\_resources/how\\_write.html](http://www.nature.com/authors/author_resources/how_write.html)
- **Editorials:**
  - Friedman GD. Be kind to your reader. *Am J Epidemiol.* 1990 Oct;132(4):591-3.
- **Further slides on manuscript writing:**
  - [www.stanford.edu/~hsrbh/courses/writing](http://www.stanford.edu/~hsrbh/courses/writing)

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February 2, 2012



## *Write Well and Prosper – Science Writing Tips*



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ACS Careers

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