



## Results and Discussion

The results and discussion sections of your research article present the major results of the study and a direct, logical interpretation of these results. The results section is usually accompanied by graphics. Note that the purpose and contents of the results and discussion are the same for both formats.

### I. Results

#### a.) Text:

The text does not merely repeat the data already expressed in tables and figures. Rather, it highlights unexpected findings and major results. It should, however, describe the findings expressed in the graphics, so that one can understand them independent of the figures.

**Purpose:** The text describes, in paragraph form, the major results of your study. This space does not serve as interpretation. Phrases such as “this means” and “shows that” should not appear here.

#### b.) Graphics:

Graphics may be in the form of drawings, diagrams, photographs, tables, and graphs. They should be large enough to read easily but not so big as to waste space. All graphics should be accompanied by detailed captions describing their contents. They should be labeled in order of appearance in text (i.e. figure 1, table 1, etc.) The symbols should be clear and a legend, if necessary, should be simple and easy to interpret.

**Purpose:** Illustrations support, clarify, and emphasize the information in the text. They help speed the reader’s understanding and provide visual evidence of the results, which is easier to believe than text.

### II. Discussion:

The discussion will state how well the experiment answered the question or proved the hypothesis. If the anticipated results do not match the actual results, explain why not. You should describe the meaning of individual results without yet relating them to the broader context of the work; that is done in the conclusion. (See the reverse side of this handout—“Putting the Results into Context: Conclusions.”)

**Purpose:** The function of this section is to provide a specific interpretation of the major results stated in the result section.

### III. Formats

1. Use with small-scale experiments where the results are few and very connected

**Results:** Text of the results section goes here, in paragraph form. Graphics are printed nearby.

**Discussion:** Text of the discussion is here. Sometimes the discussion is part of the conclusion, and the conclusion goes from narrow to general.

2. Use with complex results that are difficult to find relationships between

#### Results/Discussion

**First major result:** Text of one result is here in paragraph form, and transitions directly to discussion with no separate heading.

**Second major result:** Text of the next result is here, transitioning into its discussion. After all the results, there is a separate conclusion.

See the back of the handout for an example of each format discussed here.



## Putting the Results into Context: Conclusions

The conclusion follows a less strict outline than the introduction, but is ordered nonetheless. It will put the findings of your study, rather than the study itself, into context. In many journals and fields, passive voice is disposed of for this section and first person is used.

### I. General Statement

The first sentence or two puts the results into context by providing a general, umbrella truth relevant to the topic.

**Purpose:** A statement introduces the conclusion by reminding your readers of the generalities put forth in the introduction. This will set up the context for you to discuss the conclusions specific to your experiment.

**Example:** *In sea urchin embryos, different stressors (heat shock, Zn, EGTA, TPA) induce different stress responses and not all induce a thermotolerant response.*

### II. Major Conclusions

The next paragraph describes the major finding of this specific study. If there are several important results, this section may be several paragraphs long.

**Purpose:** This section relates each major conclusion of your work to the context introduced above. This is not a place to be a megalomaniac about the significance of your results; the tone should remain skeptical and humble. However, it should give an informative interpretation of what each result means to your field of study; i.e., what knowledge gaps your work has filled.

**Example:** *In this study, we demonstrate that a particular hyperosmotic stress, a NaCl concentration that is twice that of seawater (Casano et al. 1998), induces a thermotolerant response probably by activating a phosphorylation signaling cascade, such as the TPA treatment (Roccheri et al. 1995). We suggest that p38SAPk is the effector of this pathway because we found that SB203580 treatment inhibits the regeneration of the cilia, causes malformations, and does not give rise to acquired thermotolerance.*

### III. Future Work

Most experiments will leave researchers with more questions than answers. This section states the future research that may be done to answer these questions.

**Purpose:** This section will let your readers know that even if you do not have significant results, the work was valuable because it gave you an idea of where to go next. It will let people new to the field know what work remains to be done in that field.

**Example:** *We now plan to ascertain whether the p38 activation is a specific deciliation response or whether it is also induced by other stressors such as heat shock or EGTA, which also induces thermotolerance.*

All above examples are from Casano, C., et al. 2003. "Sea urchin deciliation induces thermoresistance and activates the p38 mitogen-activated protein kinase pathway." *Cell Stress and Chaperones* 8 (1): 70-75.