

HONORS PROGRAM REQUIREMENTS

Department of Biological Sciences
University of Pittsburgh



The Honors Program in Biological Sciences is designed to recognize outstanding students who have demonstrated excellence in their studies and research, both in execution and communication.

Summary of Requirements

- Apply for admission to the program by due date: March 30 (sophomore), November 30 (juniors/sophomores)
- Complete a major in the Biological Sciences Department
- Final GPA in Biological Sciences courses of 3.25 or above. Final overall GPA of 3.25 or above.
- 6 credits of BIOS 1904 Honors Research in a laboratory in the University of Pittsburgh
- Complete research integrity training
- Present poster
- Honors Thesis of research
- Oral Presentation of research

Before applying

- Make sure your GPA is above 3.25, both overall and for Biological Sciences classes.
- You must have pursued at least one semester of undergraduate research.
- You must have discussed your intention to apply with your research mentor, provided them with a copy of these Requirements and made sure that they are aware of their responsibilities (these are listed below)
- If your research mentor is not a faculty member in Biological Sciences then you must have identified a faculty member in our department who will act as a co-sponsor. You must have provided your co-sponsor with a copy of these Requirements and made sure that they are aware of their responsibilities (these are listed below). Almost all Biological Sciences faculty would be happy to act as a co-sponsor, just ask an instructor for one of your classes with whom you have interacted positively (make sure they are actually a faculty member in Biological Sciences: <https://www.biology.pitt.edu/people/all-faculty>)
- Make sure you are aware of the due dates: March 30 for Sophomores, November 30 for Juniors or Sophomores. Note, March 30 is too late for juniors as they will not have sufficient time to complete the BIOSC 1904 research credits by the end of the Fall of their senior year.

Application

- Download and complete the application form (it is a fillable pdf), save the file as 'Your last name-initial-YEAR YOU EXPECT TO GRADUATE-HONORSAPP-MONTH-YEAR' (where MONTH and YEAR are the date of your application, so MONTH will be 3 or 11), so this could be DOE-J-2025-HONORSAPP-3-2023.
- The application must be electronically signed by the student, the mentor and the co-sponsor (if appropriate) using DocuSign, available on the my.pitt site.

- Get a copy of your Pitt transcript. If you are a transfer student from another Pitt campus all your previous classes from there should be on that transcript as well as those from the main campus. Save your Pitt transcript as a pdf with file name: 'Your last name-initial-PITT-TRANSCRIPT'.
- If you are a transfer student from another college, get a copy of your transcript from that institution. Your last name-initial -TRANSCRIPT-2'. If you have more than one extra transcript then just increase the number in the file name.
- Write a personal Essay: include career plans; reason for choosing your major; reason for wanting to participate in Honors Program; any other pertinent information. Limit this to one page.
- Write a research prospectus outlining the basic goals and the procedures of your proposed project and cover what you expect to do for the next 2-3 semesters. Limit this to one page. This must be reviewed by the research mentor before submission.
- Save the Essay and Research Prospectus as a single pdf document with filename: 'Your last name-initial-ESSAYPROSPECTUS'
- Submit all of these documents – application, signature page, transcript(s), Essay/Prospectus, to: bioadv@pitt.edu by the appropriate due date. Send a single message with all of the documents attached; in the subject line of the message insert: 'HONORS APPLICATION'.
- If the laboratory where research is to be conducted is not in Biological Sciences then the proposed research mentor must be approved by the Chair of the Honors Committee before the application will be processed.
- Students will be notified by the beginning of the next semester if they have been accepted into the program, so that they have enough time to register for BIOSC 1904 Honors Research credits.

When Accepted into the Program

Honors folder on OneDrive

A folder will be generated for each student in the Program that can be accessed by that student on Pitt's OneDrive, named: 'Your last name-initial- Honors-materials'. Students must post the following to this folder:

- Certificates for Research Integrity Training: CITI and ISER
- All completed and signed BIOSC 1904 forms.
- For students in labs outside Biological Sciences, the final report from each semester of BIOSC 1904 research (the report must be signed by the co-sponsor).
- Pdf of a poster they have presented
- First draft of thesis
- Final version of thesis

E-mail communication

If you need to contact the Chair of the committee or the Biological Sciences Advising office regarding anything to do with Honors please make sure you have 'Honors your name' in the subject line.

Honors research: BIOSC 1904

- Honors research will be performed in a laboratory in the University of Pittsburgh.
- As indicated above, if the research mentor is not in our department then a Biological Sciences faculty member must be identified by the applicant to act a co-sponsor. The student, the outside research mentor and the co-sponsor have specific requirements for the student to fulfill research

requirements for Honors, see below; it is the student's responsibility to ensure that the mentor writes the appropriate letters

- When pursuing honors research during Fall and Spring semesters, students will sign up for credits in BIOSC 1904 Honors Research.
- A total of six 1904 credits (or equivalents) are required for Honors.
- Note, students must have been admitted into the Honors Program before they can register for BIOSC 1904.
- Equivalency option for 1904: enrolling in 1904 may not always be feasible (e.g., you are already at 18 credits for a semester, or are doing research in the summer); under these circumstances students may request that their uncredited research can count towards their requirement for Honors. To do this, contact the Advising Office by e-mail with the subject 'Honors Your name request 1904 equivalent credits' and state why you cannot sign up for official 1904 credits. If approved, Advising will send you a modified BIOSC 1904 form which you and your mentor and co-sponsor (if appropriate) will complete as for the standard one and return this to Advising. Your mentor or co-sponsor must contact Advising at the end of the semester to confirm you achieved an S grade for the equivalent credits.
- Note it is your responsibility to ensure that your mentor writes the appropriate letters at the start and end of the semester.
- There is a maximum of three 1904 credits (or equivalents) per Fall and Spring semester. If more than three equivalent credits could be completed during the Summer, then contact the Chair of the committee to discuss whether more than three can be approved.
- All research must be completed before the Honors Thesis is written in the Spring of the final year, i.e. by the end of the Fall semester of the final year.
- Students who have applied as juniors in the Fall will have only two semesters (and the summer) to complete six 1904 credits and may find it difficult to do 3 credits of research in both semesters; consequently, they may petition to have two BIOSC 1903 research credits counted toward the 6-credit total if these have been awarded earlier. To be considered, the research for those 1903 credits must have been performed in the same lab and on a project for which you plan to do your honors research. To request this option, contact the Chair of the committee and provide: (i) a copy of the BIOSC 1903 form for both credits and (ii) a one page summary of the research that was conducted for those credits.
- Students who are in a lab outside of Biological Sciences must submit the following to their departmental co-sponsor for each semester of 1904 (or equivalent): (i) A two-page prospectus describing the research question and how he/she plans to address it during the semester; this is due by the end of the second week of classes; (ii) Monthly updates of research progress with the emphasis on what the student is learning, including science and research skills; (iii) A final research report due by the last day of classes: recommended length is 1-2 pages for 1 credit, 2-3 pages for 2 credits, and 3-4 pages for 3 credits (single spaced). This final report must be signed (using DocuSign) by the co-sponsor and this document posted in your Honors folder.

Poster

- Honor students must present their research at a poster session. The poster session may be in the department (Fall retreat or Spring/Summer Undergraduate Research Fairs), university (fall Science 20XX), or national meetings.

- You must inform the Chair of the Honors Committee of your plans to present the poster; if feasible one or more members of the Honors Committee will attend the poster session. And then confirm that you have presented.
 - You must post a pdf of the poster in your Honors folder.
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Research Integrity Training

Honors students must complete CITI and ISER training on-line.

CITI

- To access this, you must log into the Pitt CITI access portal using a [Pitt HSConnect](#) username/password.
- On the home page, click on CITI Access Portal. For first time users click on the 'Instruction Sheet for Accessing and Navigating CITI' and follow the instructions for setting up an account.
- Log in on CITI Access portal using Pitt username and password.
- Click on courses, and choose the Responsible Conduct of Research. Complete course.
- Download the certificate at the end. Save as pdf with filename: 'Your last name-initial-CITI-Date'

ISER

- Go to <https://cme.hs.pitt.edu>. Log in with your Pitt user name and password.
- Click on Responsible Conduct of Research and do the Biosafety – NIH Guidelines course.
- Generate a copy of the certificate as a pdf (you will probably have to print it as a pdf). Save with file name: 'Your last name-initial-ISER-Date'

Your certificates must be uploaded to your Honors folder. You must also inform the Chair of the Honors Committee that you have completed the training.

Honors Thesis

- Write an Honors Thesis on your research in the Spring of your final year. This will be in the form of a journal article including a literature review, description of materials and methods used, results and data analysis including figures and tables, and a discussion including the conclusions and significance.
- A basic guide as to what is expected in your thesis is provided at the end of this document.
- Before writing the thesis, all 6 credits of BIOSC 1904 (or equivalents) must have been completed. It is not feasible to write the thesis and continue research.
- To help students write the thesis they must sign up for the writing class BIOSC 1905 in Spring of their final year. Writing of the Honors Thesis fulfills the requirement for a Writing Course in the major.
- It is essential that students get assistance from their research mentor in writing the thesis. They should begin planning their thesis with their mentor before the start of the Spring semester of their senior year.
- There will be specific deadlines as to when students must complete the first draft of the thesis and submit a revised version after it has been reviewed by the Honors Committee. Students must strictly adhere to these deadlines.
- Before the first draft is submitted, the thesis must have been reviewed by the research mentor and then further revised by the student. The student must give the mentor sufficient time to review their thesis so that they have enough time to revise the thesis before the submission deadline.
- Students will post the first draft of the thesis in their Honors folder.

- The first draft will be reviewed by the Honors Committee who will provide comments on how to improve the document.
 - Students will then revise the thesis.
 - Your final document must be signed and approved by you, your mentor and your co-sponsor (if appropriate) on the STUDENT'S AND MENTOR'S RELEASE page. This must be done electronically using DocuSign, available on the my.pitt site.
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Oral presentation

- Honors students must present the results of their research orally, along with other Honors candidates, at a Departmental Honors Symposium, held towards the end of Spring term. There may be more than one Symposium which will depend on student numbers.
 - BIOSC 1905 will also help students to prepare for this, but the research mentor and other members of the lab should also help; this help should include a practice talk.
 - Details of the Symposium will be provided closer to the time.
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Awarding of Honors

To be awarded honors a student must:

- Have successfully completed a degree in Biological Sciences
 - Have an overall GPA of 3.25 or above, and a GPA in Biological Sciences classes of above 3.25
 - Completed the research integrity training as evidenced by the specific certificates indicated above.
 - Have 6 credits of BIOSC 1904 Honors Research (or equivalent).
 - Have presented a poster, providing evidence of this to the Honors Chair and posting a pdf of the poster.
 - Have presented their research orally at the Honors Symposium and that presentation to have been judged of sufficient quality by the Honors Committee.
 - Have written an Honors thesis and revised it based on comments from the Honors Committee and that committee has judged the final version to be of sufficient quality.
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Responsibilities of Research Mentor

- Agree to supervise your student in their efforts to be awarded honors.
- Be aware of your responsibilities as outlined in this document.
- Review their Research Prospectus before they submit an application.
- Supervise their research
- Make sure student is becoming familiar with essential literature.
- If the student is enrolled in BIOSC 1904 Honors Research (or equivalents) make sure you are aware of how many credits they have signed up for and that over the course of the semester they are pursuing research for sufficient hours to match these credits (5 hours per week per credit).
- If you are a faculty member in Biological Sciences, and your student has signed up for 1904 credits, then provide the student with a grade for 1904 at the end of the semester as for any other class. If your student is pursuing credit equivalents then at the end of the semester you must send an e-mail to the Departmental Advising providing an assessment of the student's progress, either (a) S: Satisfactory or (b) U: Unsatisfactory.
- If you are not a member of faculty in Biological Sciences then you must review their Research Prospectus that is due before the end of the second week of classes and then review their final Research Report that is due by the last day of classes. You must e-mail the student's co-sponsor at

the end of the semester confirming that the student has performed satisfactorily and completed the appropriate number of research hours. It is the student's responsibility to remind you to do all of this.

- Help your student prepare a poster that they must present at a departmental, university or national poster session.
 - Help your student to write their Honors Thesis. This should start by the beginning of the Spring semester of their final year with planning what will be included in the thesis. They will be taking a course to help them write the thesis so they should coordinate with you regarding help with specific parts of the thesis.
 - Review the thesis before it is submitted to the Honors Committee, in sufficient time to allow the student to make changes based on your comments. It is the student's responsibility to provide you will enough time to do this.
 - Help the student to put together an oral presentation on their research.
 - If possible, show support by attending the Honors Symposium where they will present their talk. Details of this will be provided closer to the time
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Responsibilities of Co-sponsor

A co-sponsor is a faculty member in Biological Sciences and is assigned to an Honors student who is doing research in a lab outside of the department to ensure our high standards are maintained and the outside mentor is participating fully in the program.

Specific responsibilities are:

- Agree to act as co-sponsor for a student (they will approach you to do this) and sign their application.
 - Be aware of your responsibilities as outlined in this document.
 - Sign off on the student application for BIOSC 1904 credits or equivalent credits at the beginning of each semester.
 - Review their Research Prospectus describing the research question and how they plan to address it during the semester. This is due by the end of the second week of classes.
 - The student must also supply you with monthly updates in which they should emphasize what they are learning, including science and research skills. Ensure that they keep up with this.
 - Review and sign (using DocuSign) their final Research Report that is due before the last day of classes. The recommended length is 1-2 pages for 1 credit, 2-3 pages for 2 credits and 3-4 pages for 3 credits (single spaced).
 - Make sure that the student's research mentor e-mails you to confirm the student has performed satisfactorily and has completed sufficient research hours commensurate with the number of credits they were signed up for (5 hours per credit per week).
 - If they have performed satisfactorily then award them an S grade if they are signed up for 1904 credits. Or if they have applied for credit equivalents, you need to e-mail a letter to Advising that includes the grade.
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Different 'Honors' Options you may Encounter at Pitt

- You can graduate with a BS degree from the Department of Biological Sciences with *Departmental Honors*. That's what *this* program is for.

- The University Honors College has a special degree option that grants a *Bachelor of Philosophy*. This is different from our Departmental Honors. You should speak to the UHC about this option.
- The University of Pittsburgh grants undergraduate degrees *with Honors* (sometimes called “Latin Honors”) based solely on overall GPA. The University confers this automatically when you graduate. Based on GPA, they are: 3.750 = Summa Cum Laude; 3.500 = Magna Cum Laude; 3.250 = Cum Laude

Honors Program in Biological Sciences Thesis requirements

Below find instructions on how to format your thesis and advice on how to write it. Also, before you submit your first draft go through the checklist at the end.

Formatting

Font, size: Arial 11, double-spaced

Margins: 1" top and bottom, 0.5" sides

Pages numbered at the bottom

The Footer should include your name and 'Honors thesis' and the year

File name: Yourlastname-initial-HonorsThesis-versionnumber

versionnumber = '1STDRAFT' or 'REVISED'

Size

Expectations are that it will be between 15-30 pages, generally closer to 20.

Page 1: Title page, formatted as follows:

Title

Name

Date

Research performed under the mentorship of
Mentor's name and affiliation

This thesis has been submitted in partial fulfillment for
Graduation with Honors from
The Department of Biological Sciences,
University of Pittsburgh

Page 2: Table of contents

Page 3: Student's and mentor's release statements, include the following:

Student's and Mentor's Release

We the undersigned affirm that:

- The student has performed all of the experiments described herein. If other personnel have assisted in the generation or analysis of data, those contributions have been noted.
- The mentor has read **at least one** previous draft of this document and has provided comments to the student.
- The student has modified this document in response to comments provided by her/his research mentor.
- This thesis may include proprietary information, and we understand that this document will not be shared with individuals outside the Department.

[Student's full name]

Date

[Mentor's full name]

Date

General comments on the thesis

You are the sole author of this document and so you should use 'I' and not 'we'. If your experiments are part of a collaboration then you should state this, again using I, e.g. 'In collaboration with Dr Campbell, flies were mutagenized with EMS...' or I and two other students, John and Jane Doe, mutagenized flies with EMS.'

All abbreviations must be defined in the text the first time they are used.

The writing style for a thesis is not the same as for a journal article. The thesis document also serves as a record of your work for your mentor and your successors in the lab. As such, it should generally be more detailed and more expansive than a journal article. You should feel more free to express your thoughts in a thesis than you would do in a journal paper.

Page 4: Abstract.

Limited to 1 page

The Abstract is NOT a project proposal, but a summary of **why** you did this project, **what** was done and **what** you found or observed.

This should:

- Provide a brief introduction to the system being used and the problem being addressed.
- Clearly state the hypothesis(es) being tested.
- Explain how the hypotheses are being tested with a brief description of the experimental approach(es).
- Summarize the results and conclusions.
- IT MUST BE ACCESSIBLE TO A NAÏVE READER WHO HAS NO IDEA WHAT YOU ARE DOING AND HAS NOT READ YOUR FULL DOCUMENT

It should not be divided into sections.

Body of Thesis

Divide the thesis into main sections: Introduction, Materials and Methods, Results, Discussion, Acknowledgements, References, Tables (with legends), Figures and legends.

DO NOT MERGE THE RESULTS AND DISCUSSION INTO A SINGLE SECTION!! Writing a combined Results and Discussion section that is easily read by someone outside of the field (i.e. the Honors Committee) is generally beyond the capabilities of an undergraduate student, so please do not try.

Introduction

Your thesis will be read by several scientists who have no idea what you have done and, at best, may have only superficial knowledge of the system you are working on. Consequently, you must initially provide context: what is the 'big picture', why do people work on this system, why is anyone interested in this, does it have relevance outside the immediate field?

Review relevant studies related to yours to set up the problem you are addressing. Ensure that a reader is aware of the previous experiments upon which you are building. It is almost never the case that all prior information came from the lab you work in, so the published work of other labs should be summarized and cited. If there are pertinent unpublished findings from your home lab, cite them with credit to the named person or people who did the work as (Doe, unpublished, pers comm).

State the hypothesis(es) that you set out to test. Describe the experimental approach you took and then conclude the introduction with a summary of your main results and conclusions.

If the introduction is long (say over 2 pages) it should be divided into subsections; provide titles to subsections (bold the titles).

Materials and Methods

If appropriate (and usually it is) divide this up into subsections, providing a short title for each subsection (bold this subtitle).

What should be in here is fairly self explanatory. Anyone reading this section should be able to repeat the experiments you have performed. Try to keep jargon to a minimum, All the experimental approaches taken that are described in the results must be included here; this includes data analysis

(e.g. statistics) as well as how the data was acquired. Try to keep jargon to a minimum. Define all abbreviations. Some abbreviations are so universally recognized that you need not define them. Biochemical abbreviations, see (clicking on this link will download a Word file): https://www.elsevier.com/_data/promis_misc/JBCAbbreviationsAndUnits.docx

Although you will spend some time writing this section, it is best to assume that no one will read it (although you would be wrong as the Committee will definitely read it), and so when writing the Results, you must keep this in mind. In other words, provide some insight into the experimental approach taken in the Results, but obviously specific details are to be left in the Materials and Methods.

Results

If appropriate (and usually it is) divide this up into subsections, providing a short title for each subsection (bold this subtitle)

Statements you make should be supported by data in the form of tables or figures.

Remember your Results section documents your data, observations and analysis, it is not a description of a table or of a figure. The figure is there to back up a statement you are making about observations you made. So statements like 'Figure 1 shows that blades of grass on lawns are green' are usually inappropriate and it should read, 'our analysis of lawns revealed that blades of grass were green (Figure 1).' The distinction here is that you are showing only one lawn in the figure, but presumably should have assessed many lawns to back this up; the figure is there as an example to back up your more extensive analysis.

Discussion

If appropriate (it usually depends on how long this section is and how many different conclusions you have come to) divide this up into subsections, providing a short title for each subsection (bold this subtitle)

To discuss a result you will have to summarize it briefly before then going on to talk about what it actually means.

If any experiments were unsuccessful suggest reasons why and if you were to repeat them how would you do this differently.

How do your results fit in with previous knowledge/the big picture? What assumptions are your conclusions based upon? What alternative explanations are there? Did your results support your hypothesis(es)/expectations? If not, can you explain why, are there any alternative hypotheses?

If you remained in your current lab, what would you do next, what studies could be performed to support your current results and then extend them further?

Acknowledgements

Identify anyone who helped with the experiments, analysis of results or writing of the thesis and indicate how they did this. If you have received any financial support in terms of a fellowship, etc., that should be acknowledged.

References

Dealing with references is much more convenient using a program such as EndNote. Any statement you make to previous studies must be backed up with a citation inserted into the text. This applies to all of the sections. As there is not a strict limit on space, you should format your

references so that at least the name of the first author appears in the general text (i.e. not with a number).

The reference list can be single-spaced and should appear at the end of the thesis as a 'References' section, not as footnotes.

You should proofread the References list carefully, since Endnote often mangles imported references.

Tables

Formatting will vary with exactly what data you want to present.
Provide a title. A description will usually help.

Figures and Figure Legends

Figures including text labels should be prepared in a program other than Word, saved as a JPEG and then imported into your Thesis word document. This prevents formatting issues where the text does not appear properly when viewed on a different computer. Make sure your JPEGs are not too large so that the final size of your thesis document is below 5 MB. A good general rule is to use 300 dpi resolution for graphics, which provides enough data for the reader to magnify substantially on a computer screen. Line drawings or graphs can be used at 150 dpi. JPEG images should be saved with medium-high quality if your graphics software gives you a choice.

It is more convenient for reviewers to have the legends for each figure immediately below the actual figure. The legends should be single-spaced. Try to avoid running a legend on to the following page.

Number the figures. For figures with multiple panels, label the panels with a lower case letter, so, e.g., Fig. 1b.

Provide a title for the figure. This may be in the form of a declarative statement; for example, "Polyhydroxychickenwire increases the rate of cell division".

The legend must describe exactly what is shown in the figure/panel.

Although there is a tendency in current papers to reduce legends to a minimum, as your space is not strictly limited it will be of help to the reviewers of your thesis if you provide a clear description of your figures, i.e. identify exactly what a reader should be looking for, this includes in each individual panel. This may mean some repetition with the text of the Results.

If any material has come from previously published work or has been provided by your mentor or other members of the lab then this should be stated with appropriate credit.

Plagiarism

Read the informative page from the Department of English at Pitt:

<https://www.english.pitt.edu/undergraduate/plagiarism>

.. see checklist below

Checklist

Before you submit your first draft you must go through this checklist. If it is obvious that you have failed to do this, your thesis will be returned without comments.

Spellcheck! Make sure that spell and grammar checks are enabled for all sections of your text. The grammar check will catch many errors of style and usage in your writing.

Search the document for 'we'

Abstract

Can it be understood by a basic student of Biological Sciences who is not familiar with your particular area of expertise? Is there any jargon in there that is not basic knowledge for a biology student? The only way to be certain of this is to actually get one of your fellow students to read it and identify anything they do not understand....so do that, ideally at least two students.

Introduction.

When you started to write your thesis you may have intended to include more experiments than ended up in the final version so make sure your Introduction only introduces material that is in the current version (this comment applies to all sections – be very aware when you start revising your document, removing something from one section will mean removing relevant parts from another).

Now show your whole thesis to a fellow Biological Sciences student outside of the Honors program and outside your general area of expertise and ask them to read your Introduction. Then ask them the following questions:

- What system am I working on?
- What is the question I am asking?
- What is the hypothesis(es) I tested?
- What experimental approach did I take?
- What are my main results and conclusions?

Materials and Methods

Go through the results section and identify every experimental technique you performed that is described there. Then check that all these are described in detail in the M &M section.

Results

Make sure all observations or references to data are supported by a reference to a table or figure. Make sure any figures mentioned (including panel letter) actually correspond to the observation.

Discussion

Make sure all experiments described in the results are discussed, if they are not, what was the point in including them? When discussing the results you need to briefly repeat what the result actually was (obviously not in as much detail as in the Results), and when you do remember to refer to any figures or tables that back up the result (and make sure the figure or legend number is correct).

References

Go through the whole document and make sure any statements you make to previous results are backed up by a reference(s). Make sure that the reference is actually the relevant one. It is generally dangerous to cite papers from secondary sources without having looked at the cited paper. Make sure all references in the text are in the final reference list.

Tables and figures

Check your figures at the end of the document start at Fig. 1 and increase by 1.

Go through all of the document and check that all statements referring to results or data are backed up by a reference to a table or figure.

Go through the document again and check that the table or figure and specific panel referenced in the text actually matches the result being mentioned.

If you have figures with multiple panels make sure they are all labeled in sequence with no missing letters.

Check that all panels are identified and clearly described in the legend.

Repeat from earlier – check that all figures shown at the end are described in the Results...if not remove them.

updated 1/11/2022