First Year Assessment: MPhil in Developmental Biology

The first year of the 4-year PhD Programme forms the basis for an MPhil in Developmental Biology, with the following assessed work:

- **Rotation reports**: At the end of each 9-week lab rotation, you will have a minimum of 2 weeks in which to write a brief report on the research that you have performed, in the style of a *Development* paper (see “Guidelines for Assessed Work” for details). Two people (usually the Programme Coordinator and one other person) will assess the report, and the comments and overall mark discussed with you.

- **Review essay**: You will write a short review of recent advances in an area related to one of the topics of the Core Development course (see “Guidelines for Assessed Work” for details). This will be read and marked by two assessors. One of the assessors, a professional editor, will be giving feedback on style. The deadline is **Friday 1 June**.

- **Critical Appraisal**: Once you have chosen your PhD lab, you will write a research proposal (referred to as the “critical appraisal” in the special regulations). This proposal should describe the background to the field, the aims of the project, and the experimental approach that you plan to pursue. The deadline is **3pm on Friday 5 August** (note this is a University deadline, with no possibility of extension).

- At some point during August, you will have a viva with two assessors to discuss your “critical appraisal”. (You should not make any plans for August until your viva date has been set.) After the viva, the assessors will write a joint report and give an overall joint mark for the critical appraisal.

**Mark Allocation:**

Critical appraisal: 40% (final mark to be awarded after the viva)
Rotation reports (3): 15% each
Review essay: 15%

The required level for a Pass mark for each component and overall is 60%. A Distinction will be awarded to candidates attaining 75% or more overall. A score of 55.0-59.9% for any component will be considered a "Marginal Fail". A score of <55.0% will be considered a "Fail".

**Criteria for recommending the MPhil in Developmental Biology:**
In order to pass the MPhil, a candidate must:
1) achieve 60% or more overall in the examination,
2) with not less than 55% in each component.

A candidate who achieves less than 60% overall, or who achieves 60% overall but fails any component (i.e., scores <55% for any component), will be examined in a viva. If such a candidate satisfies the examiners in a viva that s/he should pass the degree overall, s/he will be allowed the minimum mark(s) in the component(s) under consideration required to satisfy the two conditions above. The Examiners shall provide a full report to the Degree Committee of the grounds on which they recommend the candidate the degree. Any such candidate who does not so satisfy the examiners in a viva shall fail the degree.
Subsequent monitoring

Year 2

Towards the middle of Year 2, i.e., your first PhD year, you will present a seminar during the morning session of the Wellcome 4-year Dev. Mech. Annual Symposium. This informal event is attended by all 4-year PhD students, the Programme Directors and the Programme Coordinator: it is an opportunity for you to present, in an informal setting, your PhD work so far and your plans for the future. (Year 4 students will present seminars in the afternoon session.) Note: this year’s Symposium will be on Friday 8 June.

In June/July of Year 2 (the exact timing depends on your host department), you will be asked to write a First Year Report for assessment by the procedures appropriate for your host PhD department. This report and the assessors’ comments will be passed to the Management Committee.

Year 3

At the beginning of Year 3 (late October/November), i.e., the start of your second PhD year, you will give a seminar to the Management Committee, all Year 3 supervisors and the other Year 3 students. The Management Committee will meet after the seminars and discuss the progress of each student and the viability of each project. The Committee will then decide whether any action needs to be taken. Students or supervisors who have themselves identified problems should approach the Committee pro-actively.

Note: during Year 3, and certainly by the end of Year 3, you should begin to consider directions for your post-doctoral career. For example, to join a lab in the United States, it is often necessary to apply a year in advance of your intended start date.

Year 4

At the beginning of Year 4 (October), i.e., the start of your third PhD year, you will be asked to write a short progress report with a strategy plan for the final year and a summary of the experiments that need to be completed before writing up. This will be discussed with your supervisor, who will give feedback and guidance for the completion of the work.

Towards the middle of Year 4 (April/May), you will present a seminar in the afternoon session of the informal Wellcome 4-year Annual Symposium.

The procedures for submission of PhD thesis and appointment of Examiners will follow those at present operating in the University, as required by the Degree Committee.
Guidelines for assessed work

You MUST read the University-wide Statement on Plagiarism (copied below). This applies to ALL your written work.
The examiners must be in no doubt as to which parts of your work are your own original work and which are the rightful property of someone else.

You can avoid plagiarism by NEVER COPYING TEXT (unless you actually want to give a direct quotation, when the copied text must be in quotation marks AND the source given). Instead, make the point in your own words AND give the source of your information.

The following website is a very good source of clear information on plagiarism and how to avoid it: https://writing.wisc.edu/Handbook/QPA_plagiarism.html

UNIVERSITY-WIDE STATEMENT ON PLAGIARISM
http://www.admin.cam.ac.uk/univ/plagiarism/students/statement.html

The General Board, with the agreement of the Board of Examinations and the Board of Graduate Studies, has issued this guidance for the information of candidates, Examiners and Supervisors. It may be supplemented by course-specific guidance from Faculties and Departments.

Plagiarism is defined as submitting as one's own work, irrespective of intent to deceive, that which derives in part or in its entirety from the work of others without due acknowledgement. It is both poor scholarship and a breach of academic integrity.

Examples of plagiarism include copying (using another person's language and/or ideas as if they are a candidate's own), by:
- quoting verbatim another person's work without [using quotation marks and giving] due acknowledgement of the source;
- paraphrasing another person's work by changing some of the words, or the order of the words, without due acknowledgement of the source;
- using ideas taken from someone else without reference to the originator;
- cutting and pasting from the Internet to make a pastiche of online sources;
- submitting someone else's work as part of a candidate's own without identifying clearly who did the work. For example, buying or commissioning work via professional agencies such as 'essay banks' or 'paper mills', or not attributing research contributed by others to a joint project.

Plagiarism might also arise from colluding with another person, including another candidate, other than as permitted for joint project work (i.e. where collaboration is concealed or has been forbidden). A candidate should include a general acknowledgement where he or she has received substantial help, for example with the language and style of a piece of written work.

Plagiarism can occur in respect to all types of sources and media:
- text, illustrations, musical quotations, mathematical derivations, computer code, etc;
- material downloaded from websites or drawn from manuscripts or other media;
- published and unpublished material, including lecture handouts and other students' work.
Acceptable means of acknowledging the work of others (by referencing, in footnotes, or otherwise) vary according to the subject matter and mode of assessment. Faculties or Departments should issue written guidance on the relevant scholarly conventions for submitted work, and also make it clear to candidates what level of acknowledgement might be expected in written examinations. Candidates are required to familiarize themselves with this guidance, to follow it in all work submitted for assessment, and may be required to sign a declaration to that effect. If a candidate has any outstanding queries, clarification should be sought from her or his Director of Studies, Course Director or Supervisor as appropriate.

Failure to conform to the expected standards of scholarship (e.g. by not referencing sources) in examinations may affect the mark given to the candidate’s work. In addition, suspected cases of the use of unfair means (of which plagiarism is one form) will be investigated and may be brought to one of the University's Courts. The Courts have wide powers to discipline those found guilty of using unfair means in an examination, including depriving such persons of membership of the University, and deprivation of a degree.
Rotation Report Guidelines

Before writing your first rotation report, download Development’s checklist for technical & statistical reporting, which is used to ensure good reporting standards and reproducibility: http://dev.biologists.org/sites/default/files/Checklist.pdf. We also recommend that you read:

Vaux et al. (2012) Replicates and repeats - what is the difference and is it significant?
A brief discussion of statistics and experimental design, EMBO Rep. 13, 291-6

Write your report in the style of a Development paper, as described below. Use 1.5 line-spacing and a font no smaller than 12-point Times (as used here). Insert page numbers. In-text citations should use the Harvard (name, date) system: see Development’s guidelines for how to cite different types of literature: http://dev.biologists.org/content/manuscript-prep#3.3. Use referencing software (EndNote, Papers, Bookends).

The rotation reports have a strict word limit of 7000 words, including the Figure Legends but excluding the Bibliography and words in Tables. The word count must be given on the title page. Being able to adhere to a word limit is an essential skill: journals and funding agencies have very strict word limits. It is always possible to re-word sentences to cut words.

The guidelines below are copied from Development, with some modifications. Please also read Development’s text preparation guidelines (general info., units and nomenclature): http://dev.biologists.org/content/manuscript-prep#3.3.

The Abstract (a single paragraph of ~200 words) should succinctly introduce the topic of the report, summarise the main findings and highlight the significance of the data and main conclusions. Do not include subheadings or citations. Avoid any non-standard abbreviations.

The Introduction should succinctly provide the background information that is required to set the results into their proper biological context (try to give the broader context - why should this specific topic be of more general interest?). It should not contain subheadings.
(Note: This is a report, not a paper: it can be helpful to include schematic figures: these do not have to be original, but the source must be acknowledged in the legend and References.)

The Results should describe the results of the experiments performed and should be broken up by subheadings to organise the findings presented and walk the reader through the results. (It’s most helpful if the subheadings indicate the main conclusion of the subsection.) Always include numbers, distinguishing biological and technical replicates.

This is a report of what you did in your rotation: don’t just put in your best (or your only positive) results, but discuss problems encountered, troubleshooting, etc. Also, guide your reader! Explain the rationale, approach and conclusions for each experiment.

Ask your supervisor for advice if you are unsure how to present your data. Please read Development’s image manipulation policy (http://dev.biologists.org/content/journal-policies#images). It is simplest to prepare figures (which should be in ‘portrait’ layout) in Photoshop, Illustrator, Freehand or Powerpoint. Note that 5-10% of men are red-green colour-blind: use magenta (equal red+blue)/green instead of red/green for 2-colour images, and provide single-channel data in grey-scale in addition to red/green/blue images. For other acceptable colour combinations, see http://jfly.iam.u-tokyo.ac.jp/color/index.html.

The first sentence of each Figure legend should summarise the figure and be in bold. Each figure legend should stand alone and contain enough information to ensure that the figure is understandable without having to refer to the main text. Figure panels should be
labelled (A, B, C, etc.), and each panel should be described in the legend. Any abbreviations not given in the main text should be defined.

All Figure panels and Tables should be referred to in the text, in order (whether individually or grouped). If you can’t fit a Figure with its legend on the same page, put the legend on the facing page (it’s fine to print the report double-sided). As in a published paper, the text should be continuous, without any big gaps before or after figures, or between sections (though do introduce extra lines to avoid any subheadings floating on the last line of a page). It’s easiest to prepare the figures and legends in a separate document: once the main text has been finalised (i.e., after receiving comments from your PI), insert each figure and legend on the page immediately following the page on which you mention the figure for the first time, without leaving any big gaps before or after. (Alternatively, insert the figure and legend on the page immediately following the page on which you finish describing it.)

The Discussion should explain the significance of the results and place them into the broader context of the current literature. Suggestions for further experiments should be included. Subheadings are helpful, to highlight important areas that are expanded on in the text. It’s helpful to start the Discussion with a brief re-statement of the overall rationale and aims, and to end with a paragraph summarising the overall conclusions.

The Materials and Methods should be divided into sections with subheadings, and include sufficient detail to allow others to understand and replicate the experiments in conjunction with cited references. Give priority to novel approaches, and condense standard molecular methods by citing previous publications, manufacturer’s instructions, etc. Primers, antibodies and strains may be provided as tables (which must be referred to in the text, like figures).

The Bibliography should include all authors (unless there are more than fifteen, when you may use ‘et al.’ after the 15th author). Proofread your Bibliography as well as the text! Amend any incorrectly imported journal names, etc, in your referencing program library, and make sure genus and species names (and gene names, as appropriate) are italicised in the titles.

There should not be any Supplementary Information other than movies (weblink or DVD).

**General stylistic point:** acronyms make the text much harder to read, so avoid using them wherever possible: never for single words; avoid for 2-word phrases. For 3-word phrases, only use an acronym if it’s repeated multiple times. Define all acronyms at first use.

**Use a spell-checker,** adding in technical terms as you go along. If you are a non-native English speaker, it can be useful to ask a native speaker (who does not have to be a scientist) to read the report through for mistakes in English usage/grammar, before submitting the final version. Any assistance should of course be acknowledged in an Acknowledgements section.

Make sure you leave sufficient time to get comments from your PI on the report, and make any suggested changes before submitting the final version.

You should produce THREE bound copies of the report and a pdf version. If, unusually, you do not have access to a colour printer in your rotation lab, the report may be printed out by AVMG (PDN, Anatomy basement; funding code PMKS). AVMG will bind the report (funding code PMKS). One bound copy should be given to your rotation supervisor. The other two bound copies (one of which you will get back after assessment) and the pdf copy should be submitted to Aileen Briggs devmech@hermes.cam.ac.uk by:

Rotn. 1: Fri 12 January, 3pm; Rotn. 2: Fri 13 April, 3pm; Rotn 3: Fri 26 July, 3pm

The reports will be assessed by two assessors, one of whom is usually the Programme Coordinator. **PLEASE** take their comments on board when writing subsequent reports.
**Review Essay Guidelines**

For your review, you may choose a topic related to any of the Core Course sessions: you will have a week following the introductory session within which to submit your suggested title to the session leader and the Programme Coordinator to check your title is appropriate. We would prefer it not to be too close to your rotation projects. The review is an independent piece of work: you should not seek assistance or comments from others.

We suggest you follow the guidelines for Progress articles in *Nature Reviews Molecular Cell Biology*. These focus on one topical aspect of a field in which strong advances are being made, rather than providing a comprehensive literature survey. This article format is short (<2500 words), so you should be careful not to choose too broad a topic. It’s better to go into depth on a more focused question and try to be critical of the papers that you discuss.

Please give the **word count** on the title page.

**Title**: short and appealing (≤ 8 words), aiming to summarize a key message of the article.

**Preface**: 75-100 words, without reference citations. This should briefly explain the necessary background and the take-home message, and emphasize the recent developments that make your review timely.

**Review structure**: 2500 words of text, with the option of 1-2 text boxes at <300 words each. This word limit does not include text in tables, figure legends, abstract or references.

This needs to be carefully written to attract the attention of those who are not experts in the field. The **introduction** should provide essential background information and context (and explain general terms), and outline the rationale and purpose of the article, e.g., why is the subject important; why are you writing about it now; what recent developments in the field make it topical? Use concise, informative **subheadings** to guide the non-specialist reader and provide clear links between sections. The **conclusion** should include a strong take-home message and include a clear indication of future research.

**Figures**: You should include one or two diagrams that illustrate the background science or specific mechanisms being described: try to make these original. If you do adapt any published diagrams, please make sure that you reference them appropriately. Figures should always have a short, explanatory **title** (as well as a legend). Figure **legends** must explain the figure fully without reference to the text.

**Text boxes**: You could include 1-2 text boxes. These are a useful tool for explaining basic concepts to non-specialist readers or for elaborating on a concept that is relevant to the article but is slightly peripheral to its main theme. Each box should have a concise title. Boxes should contain 300 words maximum and they can include a figure (but not a legend).

**Tables**: Require a single-sentence title but no legend. Abbreviations (if not defined in the main text) and full explanations should be footnoted (using letters).

**References**: we ask you **not** to follow the *NRMCB* format, i.e., instead of numbering citations, use “Alpha and Beta, 1998; Gamma et al., 2005; Delta, 2008”, etc.

**THREE** paper copies of your review (bound if you wish, though this is not essential) and a pdf version should be submitted to Aileen Briggs by **Friday 1 June**, and both Word and pdf versions emailed to the session leader (details to be confirmed).
Critical Appraisal (Research Proposal) Guidelines

Note: You should inform the Programme Coordinator of your preferred choice of PhD lab and provisional critical appraisal title by 12pm on Thursday 21st June.

1. The maximum number of words, including tables, figure legends, and appendices, but excluding bibliography, is 8000. This is an upper limit: you do not have to use the maximum! Put the final word count (excluding bibliography) on the cover page. In-text citations should use the Harvard (name, date) system.

2. You must include in the bound report a Preface with a signed statement along the following lines: "I confirm that the material in this Critical Appraisal is not copied from any published material, nor is it a paraphrase or abstract of any published material unless it is identified as such and a full source reference is given. I confirm that, other than where indicated as above, this document is my own work."

3. The organisation should be:

(i) Aims of the project
This should be succinct, with perhaps a few sentences of overview explaining the general focus and then listing some specific objectives/goals.

(ii) Background and work that has led up to the project.
This should set the scene for the research, so needs to be a summary of the relevant literature, perhaps beginning more broadly and getting more specific. It may include some preliminary unpublished data from your work or from other work in the lab if it is relevant. It may also include some diagrams or pictures of data if they are helpful. We suggest that about 1/3 of the proposal might be background, but there is no set rule.

(iii) Experimental design and methods to be used in investigating this problem.
This should describe your plan of investigation. It is often helpful to subdivide this into sections. These might represent sequential steps in the investigation (e.g. genetic screen; molecular characterisation of genes; etc.) or parallel approaches (e.g. loss of function studies; gain of function studies; etc.) or different questions to be addressed (e.g. Does X regulate Y? Is X essential for mesoderm development? etc). See what works best for your proposed work. Remember to think about issues like:
- If you will be doing a screen and then characterising some of the genes isolated, how will you choose which ones to characterise?
- Will you be able to distinguish control from experimental animals? How?
- **What controls will you use to test whether your results are meaningful?**
- Do you foresee any pitfalls? If so, how might you circumvent them if they arise?
- What are your back-up plans in case this project fails to work out as expected?
Please include a time-line, or flow diagram, to show you have a realistic idea of how long each part of the project is likely to take.

(iv) Budget.
This should be an appendix (and does not count towards the word limit). Don't feel the need to go into too much detail here, but think about where the major costs of your project will lie. Subdivide the budget into: animals and animal costs (be it worms or mice etc.), consumables (e.g. enzymes; molecular biology kits; antibodies; tissue culture reagents; tips, tubes and
other plastics; check out the basic costs of some of these and consider where the bulk of your costs are going to lie, perhaps list a few major categories), equipment (if you need any specific equipment; if not there may not be anything in this category). You should try to find as much of this financial information out for yourself as possible, rather than relying on your supervisor (they will not be at all happy to have you ask them about it!!). You should have access to catalogues and the web, so do some research. The aim is to increase your awareness of the costs of different kinds of experiments.

Note: It is **very** important to get feedback from your supervisor on at least one draft. Please allow yourself enough time for discussions with your supervisor and to get their feedback, and check on your supervisor’s availability – s/he may be away for part of the writing period, so you need to take this into consideration in your planning.

THREE bound copies of the proposal, together with the “Certificate of Submission” form (http://www.gradschl.lifesci.cam.ac.uk/Current%20Students/Lifecycles/SubmissionOfDissertationForm.rtf/view) and a pdf version of the proposal, should be submitted to Aileen Briggs by 3pm on Friday 5 August. Please note that this is a University deadline: there is no possibility of extension.