

Guidelines for Laboratory Notebooks

Using a Laboratory Notebook to record ideas, inventions, experimentation records, observations and all work details is a vital part of scientific research. Careful attention to how you keep your Laboratory Notebook is required, it must be detailed enough for someone else to read and understand exactly what you did and why you did it. The Laboratory Notebook is a vital record of your research work whether it is for publication, thesis writing, patent purposes, legal records or documenting drug research under Good Laboratory Practice (GLP) guidelines.

The presence of data in laboratory notebooks can significantly affect DCU's ability to assert its rights in important intellectual property by establishing a firm "date of invention". The "date of invention" is determined by the date of the witness's signature. In a worst case scenario, your laboratory notebooks may eventually become important evidence in litigation by establishing the date of invention and proving you were the first to invent. In litigation, high quality laboratory notebooks can produce a significant "edge" for DCU, potentially affecting the financial reward paid to the institution and its inventors.

UPON STARTING YOUR LABORATORY NOTEBOOK

Complete in full all details on the first page of the Notebook (name, research project, dates etc.). Researchers working in more than one project and being funded by different sources should use a separate laboratory notebook for each project. Keep a Table of Contents for ease of reference later at the front of your notebook.

RECORDING OF DATA IN YOUR LABORATORY NOTEBOOK

- Enter all research data directly into the laboratory notebook where possible.
- All entries should be in **permanent black ink** (this will facilitate legibility, photocopying, and microfilming), be legible and neatly kept, in chronological order, dated and understandable to a co-worker.
- Any unused pages or portions thereof must be closed out with a diagonal line. Never skip pages with a diagonal line. Never skip pages with the intention of returning and filling in data at a later date.
- When making entries do not erase or use correction fluid or the like. Strike out errors with a single line through the mistake so that it still may be read; enter the corrected word(s) or value(s) above the error, as well as the reason for the correction. Initial and date all corrections (under no circumstances should pages be removed).
- **Never erase or remove material** you have added. Entries updating a previous entry should be recorded on a separate page and cross-referenced to the earlier entry (with appropriate explanation).
- Leave at least a half-inch margin at the inside (bound) edge of each page, to facilitate photocopying and microfilming. Endeavour to keep entries inside the printed margins of each page.
- Use **one laboratory notebook per project**. Researchers should maintain running indexes within each book, including date, experiment number, objective / subject and page number.



- When beginning a new book, the researcher should enter a cross-reference to the last notebook used (e.g. “Continued from Notebook # ____”). Likewise when a book is closed out, a cross-reference to the succeeding notebook should be entered (e.g. “Continued to Notebook # ____”).
- When starting a new page, always enter the title, project name / number, and date.
- Only one date should be used per page. For patent purposes, new experiments should always be started on a new page and dated at the onset of each experiment. The purpose/objective of the experiment should be clearly stated.
- In cases where the experiment continues over more than one day, each entry must be dated and continuation pages must be clearly annotated. For patent purposes, each page should not contain entries for more than one day.
- Only if absolutely necessary should new entries be added to previous pages, when subsequent work of later date is already recorded on succeeding pages. **Backdating of these entries is strictly prohibited.** Use the current (actual) date of entry.
- Keep the Table of Contents or Index current.
- All project related or other activities such as breaks in research for various reasons including holiday etc. should be recorded, signed and dated.

ORGANISING ANCILLARY DOCUMENTATION

- If at all possible, supporting data should be affixed into the notebook. Attach inserts (folded graphs, raw data tables, or computer printouts) with transparent tape, or approved labels. Care should be taken so that the tape covers no data and that inserts are not affixed in such a manner as would later hinder photocopying or microfilming of all the data and observations on the page. **Initial across both the insert and notebook page.**
- Occasionally, secondary sources of data may be too large or inappropriate to attach directly to your notebook. In this case, you can add all secondary sources (raw data sheets and other supporting documentation that cannot feasibly be incorporated into bound notebooks, but are needed as permanent record of specific experiments) to ancillary record maintained precisely for this purpose. In all cases, ancillary documentation must be cross-referenced to the appropriate notebook number and page and *vice versa*. Additional information, such as the project name / number, study name, device used to collect data, date of collection, researcher’s name, etc, is also helpful.
- Specify computer programs used to perform calculations on raw data (not fully described in the study protocol or method) in the laboratory notebook. Source codes are not necessary, but indicate the nature of the calculations.
- Electronic data should be cross-referenced and a hard copy supplied where possible. Duplicate copies should be made and backed-up regularly.



ORGANISING DATA

The importance of keeping careful, accurate records of laboratory work, to prove inventorship and to assist in preparing the patent specifications which, by law, must describe the invention, cannot be overemphasised. Dependence on memory or scanty notes for this purpose may result in an invalid patent. Any record may serve as evidence to prove inventorship, but the laboratory notebook is the most important.

- **Describe methods in detail** or by reference to an approved protocol, standard operating procedure or method of the date of a previous notebook entry at the beginning of the experiment (cross-reference and not any changes in these instances).
- Original concepts, data, results, observations, etc. should be recorded using **separate headings** to differentiate each. Record information in a systematic and orderly manner. (Language, charts and numbering systems should be maintained consistently throughout).
- **Keep entries factual** when reporting an experiment. Premature or hasty statements such as “an experiment was unsuccessful” should be avoided. If recording an idea to be worked on later, be full in your discussion; use general language, state equivalents, etc.
- **Keep entries up-to-date.** While the making of entries **directly into the notebook** may have disadvantages (accidents do happen), it is always preferable. Advance attention to planning the experiment will give a clearer, more intelligible record.
- Make the **entries complete**, so that one skilled in the art would be able to repeat the work without asking questions. The procedure should be clearly stated either expressed words or by reference.
- Record the findings regarding a compound's/cell line/molecule/other reagents etc activity in the notebook at the end of each experiment. The result, clearly set forth, should be supported with some sort of analytical data.

SIGNING DAILY ENTRIES AND OBTAINING WITNESS SIGNATURES

- Entries should be dated and signed by the researchers on the day the work is performed.
- Only the person to whom the notebook is issued should make entries in the notebook (excluding witness signatures discussed below).
- For verification of work, all original notebook entries require prompt witnessing (e.g.; daily, weekly, etc, as dictated by the centre policy where the work is being undertaken). The witness must sign and date each page. The person who witnesses the notebook entry should be aware of and understand the work conducted but who is unlikely to be an inventor on any patent that may arise. The witness should not be engaged in the project that is the subject of the notebook entry.



DOCUMENTING PATENT ACTIVITIES

A primary purpose of a Laboratory Notebook is the support of documenting work that may be patentable. To support patent activities, it is necessary to provide clear, concise, chronological entries with specific dates. To rely on these dates, you must have at least one non-inventor corroborate that the events actually happened and that he or she understood your invention by signing and dating the "Disclosed to and Understood by" signature blocks.

Your Laboratory Notebook should help you document and prove:

- *Conception Date*--The date that you knew your invention would solve the problem.
- *Date of reduction to practice*--The moment that you made a working embodiment of your invention.
- *Diligence in reducing your invention to practice*--Diligence refers to your intent and conscious effort to make a working embodiment. You are not required to rush, or even to take the most efficient development strategy. But your Notebook must include details relating to your diligent activities. These are dates and facts that show what activities you have conducted to reduce the invention to practice, and when such activities were conducted. Since you may still be diligent despite periods of not working on reducing your invention to practice, always remember to provide reasonable excuses for these periods of inactivity by supplying facts relating to why there was no activity during the period in question. (e.g., unavailability of test conditions or equipment, holidays etc.).
- *How to make and use your invention*--provide documentation details sufficient to teach a colleague how to make and use your invention.
- *The best mode of practicing your invention*--document the best way to practice your invention.

A non-inventor colleague should corroborate each of these events/facts by signing the "Disclosed to and Understood by" on the relevant pages.

CLOSING OUT NOTEBOOKS

Final page should be crossed out, signed and witnessed.

Notebooks not being used for frequent reference are to be returned to the Laboratory Notebook site co-ordinator, principal investigator, supervisor or central administrator. If a notebook is being returned with unmarked pages, write "Notebook closed; no further entries", following the last recorded data. Date and sign the page.

Official DCU Laboratory Notebooks are available from Ms. Michelle Meehan, Office Vice President for Research (michelle.meehan@dcu.ie, Ext. 8000) and these should be used by all researchers irrespective of their grouping. Each Laboratory Notebook has a number and is assigned to a particular researcher on a particular project. Only one project should be entered into each Laboratory Notebook.