



Intellectual Property 101: Lab Notebooks

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Invention Process

- Conception

AND

- Diligence in Reducing Conception to Practice



Invention Date

- The initial idea date that is supported by signed, dated, and witnessed records of the conception.
- Patent systems encourage refinement and public disclosure of inventions; therefore the initial idea date isn't necessarily the 'invention' date. Diligence in reducing the invention to practice must be shown.



Conception

- Creation in the inventor's mind of a product or method used to solve a problem



Diligence

- Generally steady, uninterrupted and constant work following the conception of an invention



Reduction to Practice

- Actual - experimentally verified to work
- OR-
- Constructive - filing of a patent application that describes the invention in such detail that an individual of ordinary skill in the relevant field could understand and practice the invention
- Regardless of the type of reduction to practice employed, patent validity can be challenged if the disclosure fails to enable a person of ordinary skill in the art from practicing the invention without undue experimentation.



First to Invent – Scenarios

- Party 1 was first to conceive and reduce to practice, regardless of diligence. Party 1 prevails.
- Party 1 was the first to conceive but Party 2 was the first to reduce to practice. Party 1 failed to show diligence. Party 2 prevails.
- Party 1 was the first to conceive and was diligent to reduce the invention to practice, although Party 2 was the first to reduce to practice. Party 1 will prevail.



Why are Lab Notebooks Important?

- It is good scientific practice
- Benefit you in preparing a manuscript, thesis or presentation
- Best sources of evidence for establishing a date of invention
- Lab Notebooks may be only way of recalling actual events which occurred at a particular time



Basics

- Maintain as Confidential Documents
- Use Permanently Bound Notebooks
 - Consecutively numbered pages
 - Good paper quality
 - Used by a single researcher
 - Used for a single project
- Notebooks should be used as a diary of researcher's daily activities, not as a data repository
 - Sufficient detail to enable duplication
 - Factually Complete



Basics

- Entries
 - Enter data as work is performed
 - Legible
 - Black permanent ink, no highlighters or markers
 - Do not use abbreviations, slang, code names or product codes without defining them clearly
 - Be consistent with nomenclature
 - Do not skip pages or leave empty spaces at bottom of page
 - Never tear out or remove page from notebook
- Researcher Signature
 - Sign and date each page
 - Do not change entry after signature has been added, additional information or correction should be with new entry



Content

- Ideas, in particular - how to a solve problem
- Descriptions of Experiments
 - Purpose
 - Materials, Equipment (Calibration)
 - Experimental Procedure
 - Data, observations
 - Results, data reduction, graphs
 - Conclusions



Content

- All activities should be accounted for, even if it is only to note that you were waiting for sample analysis that resulted in delay in progress
- State reasons for not working on a project for any period of time. Questions regarding diligence may come up years after lab notebook entries so note even apparently irrelevant entries, such as “on vacation”, “sick”, etc.
- It is just as important to record failures as it is to record successes. A list of failed experiments may even be powerful evidence of unobviousness.



Errors

- Cross out any mistakes with a single line, followed by date and initials of researcher
- No Erasures
- Do not obliterate error beyond recognition
- No Correction Fluid
- Never remove pages



Words/Phrases Not To Use

Words/Phrases Of Legal Significance Inappropriate To Use Because They Could Be Misconstrued At A Later Date

- Obvious
- Obvious over X art
- Prior art
- Has/lacks inventive step
- Anticipates
- Anticipates the X art
 - (Instead say “different” or “distinguished by”)
- Reinvented
- Best mode
- Predatory words
 - Kill
 - Punish
 - Destroy
- The attorney said.....
- Legal said.....
- This art is very/definitely, highly relevant
- We don't need to inform the Intellectual Property Office because
- Infringe
- We infringe/don't infringe because
- Abandoned/suppressed
- Concealed
- Adequately enables/does not enable
- This patent's value is.....



Attachments

- Permanently affix attachment to laboratory notebook
- Researcher should sign and date across corner of attachment
- Do Not stack attachments
- If attachments cannot be added to the notebook itself, then any reference to them should be consistent and such attachments should be stored in an orderly, readily retrievable manner.



Witness Requirements

- Witness:
 - University non-inventor/non-collaborator
 - Has read and understands work
 - Preferably witnesses work in entirely different lab
 - Signs each page of notebook
- Time:
 - Obtain signature of witness within 1 week
 - Witnessed immediately for significant research advances, results and potential inventions



Laboratory Notebook Example

PAGE NUMBER

DATE

SUBJECT

10
Date May 11, 1999 P&G Restricted 8 ← 9
Subject Preparation of 7-Ethyl-5-Fluorobenzimidazole Using Nitrogen Oxide sed

13
Name of HCS-1438-8-19 : HCL-3148-124
NOE a) S 141.579
b) S 131.304
c) S 139.847
NOE d) S 114.302
e) S 91.202
f) S 29.268
g) S 12.978
h) S 133.285

MS of HCS-1438-8-19 : HCL-3148-125-126
MW = 273.0 (M_W)⁺ for 5-fluorophenyl
Name of HCS-1438-8-21 : HCL-3148-127

NOE a) S 7.963, 5, 1H
b) S 7.978 (s=8.6Hz), 1H
c) S 8.806 d (s=8.9Hz), 1H
d) S 5.069 bs, 3H
e) S 2.888 (s=7.5Hz), 2H
f) S 1.209 (s=7.5Hz), 3H

14
Name of HCS-1438-8-21 : HCL-3148-128

NOE a) S 137.711
NOE b) S 114.115
NOE c) S 113.784
NOE d) S 113.920
e) S 19.116
f) S 12.545

MS of HCS-1438-8-21 : HCL-3148-129-130
MW = 162.0 (M_W)⁺ for starting material
MW = 323.2 (2M_W)⁺
MW = 147.1 ?

Retained one sample of HCL-1438-8-19 to reaction flask and removed volatiles from a 100 mL yellow solid. Cooling liquid on still on rim of vessel (HCS-1438-9-32)

Worker's Signature [Signature] Date May 14, 1999
Corroborating Witness [Signature] Date 8 Jun 00

ATTACHMENT WITH SIGNATURE AND DATE

EMPTY SPACE WITH INITIALS

RESEARCHER SIGNATURE AND DATE

WITNESS SIGNATURE AND DATE

10
Date May 11, 1999 P&G Restricted 9 ← 10
Subject Preparation of 7-Ethyl-5-Fluorobenzimidazole Using Nitrogen Oxide sed

wt HCS-1438-9-22 = 52.8272g
= 52.6227g
wt HCS-1438-9-32 = 0.2015g

Added HCS-1438-19-12 to HCS-1438-9-32 using red glass.
Scrapped off residue on tubing & then a yellow glass.
Purified on still on rim of vessel. wt HCS-1438-10-7 = 0.2676g
Use HCS-1438-10-7 in 336 (HCS-1438-11)

Worker's Signature [Signature] Date May 19, 1999
Corroborating Witness [Signature] Date 8 Jun 00



Storage and Retention

- Takes from 2-6 years for a US patent application to issue
- In addition, a patent may be litigated at any time during the life of the patent (either 17 years from the date of issue or 20 years from the patent application date, depending on the patent)
- Therefore, store notebooks in a cool, dry place away from potentially damaging light, corrosive agents and organic fumes
- If they are stored in an area with a sprinkler fire control system, they should be stored in a plastic bag



Factors that reduce credibility and value of laboratory notebook

- Illegible entries are totally worthless
- Unsigned or undated pages are almost totally worthless because even if accompanied by sworn statements the pages may not be accepted as credible
- Notebook pages which have not been witnessed are almost as bad as unsigned and undated pages
- Long delay between signing of page by inventor and witness may raise questions



Factors that reduce credibility and value of laboratory notebook

- Consecutive notebook pages which are not dated in chronological order raise questions
- Missing notebook pages raise questions
- Erasures and deletions raise questions (later discovered mistakes should be corrected and explained on next available blank page, referencing the page with the mistake)



Electronic Records

- Are not yet clearly acceptable in legal proceedings as a substitute for original, bound hand-written records.
- Reasoning: Computer dates can be updated and changed at will
 - Dates are subject to tampering
 - Difficult to serve as evidence that their content was created at a particular time
- For electronic records, inventor will have the burden of proving that such records could not be altered subsequent to the date of entry of the information after being witnessed.



Electronic Records

- If electronic records are used, establish an official procedure for electronic record keeping.
 - Use read-only optical disk images
 - Back up and write protect electronic data
 - Reference the electronic data in a signed, dated and witnesses handwritten notebook
 - Store electronic records in a safe repository
 - Electronic or digital signature software may be employed to enhance the credibility of the electronic records
 - Use hardware/software that prevents the ability to edit original research descriptions
 - Ensure security to prevent unauthorized access to the system.



Thank you



LOUISIANA TECH UNIVERSITY



Questions/Comments

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