How to start writing your grant proposal?

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Outline

- Introduction
- Choosing your proposal topic
- Example
- Start writing
  - Free writing
  - Proposal outline
  - Team writing
  - Proposal workplan
- General tips

Why is it important to get external funding?

1. Good research needs money:
   - Equipment
   - Chemicals
   - Salaries for full time researchers
   - Conferences

2. Boost your CV
   - After you get your PhD you are evaluated by the quantity/quality of papers you publish and by the amount of funding you receive.

3. Increase your income

Do not make this your main goal

Is obtaining funding easy?

- The answer is NO ☹

  - Which topic should I choose for my proposal?

  - Putting down your ideas onto paper is hard.

  - What is the best structure of the proposal?

  - You want to make a perfect proposal.

- There are tips and tools that can help you overcome this challenge ☺

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Choosing your topic-I

- You have to stay on top of literature
  - Know key challenges in your field. For example:
    - Early cancer detection.
    - Low cost microfabrication.
    - High efficiency – high temperature photovoltaic cells
  - Know what has been done to address these challenges
    - What worked and what did not work.
    - Capabilities and limitations of each technique/method.
  - In brief, you have to read <u>lots and lots</u> of papers.
    - Subscribe to e-mail alerts and e-contents of journals.
    - Attend conferences and seminars
    - Use bibliography management software (e.g. EndNote)

Choosing your topic-II

- Collaborations, collaborations, collaborations!
    - Scientific challenges are inherently interdisciplinary.
    - Combining the expertise of different researchers makes the proposal stringer

- Keep an open door policy:
    - Talk to other researchers (both inside and outside your discipline) about your research interests and learn about theirs.
    - Share your skills and experience with your colleagues.

- Many successful research projects are based on combining techniques from different fields.

- Strong interdisciplinary teams draw good reviews.
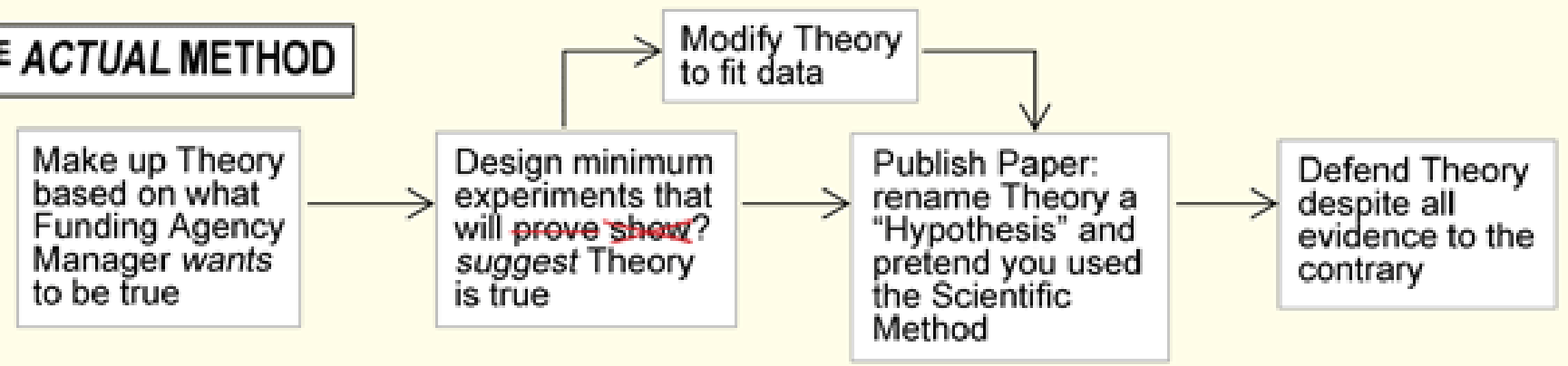
Choosing your topic-III

- What are the funder priorities?

  - The topic you choose should fulfill funder/call objectives

  - For example you can not suggest a topic to Grand Challenges Canada on Malaria detection using SEM imaging.

- Which of my expertise fits these priorities?

- Do I need collaborators?

- What are the available/reachable facilities?
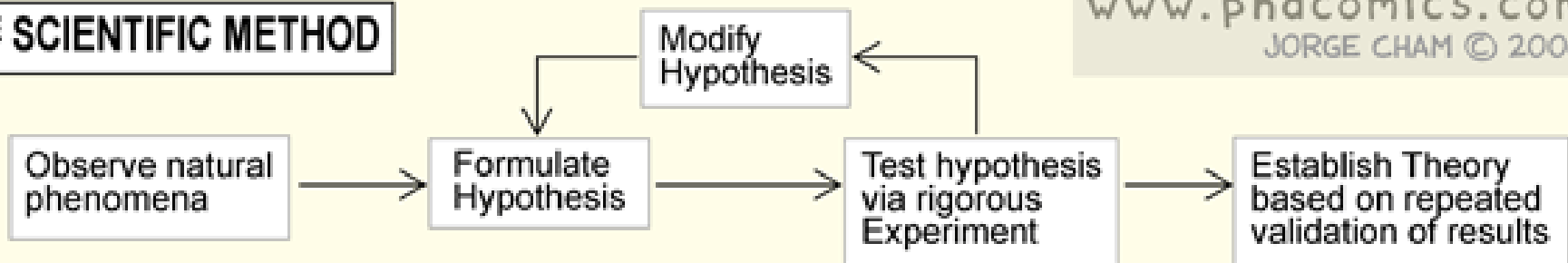
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Choosing your topic-IV

- "Shoot for the moon, but keep your feet on the ground." Aaron Wheeler

  - Choose realistic targets that can be achieved within the grant duration.

  - But always link these targets to the higher level goals (cure cancer, more accessible renewable energy…etc)

- Remember, your "Moon" should fit within funder priorities and you should <u>clearly state </u>this in the proposal.

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Example: Reintegration grant App.

- "Low cost solutions to microfluidic device fabrication in developing countries"
  - Was based on only one idea to fabricate devices.
  - Idea require collaborators from other fields (not allowed in reintegration grants at that time)
  - Could be trivialized by reviewers.
- "On-chip liquid handling for point of care devices based on microfluidics"
  - Did not have full picture of what could be done.
  - No time to polish idea.
  - Did not know how to measure flowrates to quantify project outcome.
  - Again, needed collaborators.

Examples: Reintegration grant App.

- "Modeling Droplet Actuation in Digital Microfluidics to Enhance its Performance in Biomedical Applications"

  Link to funder priorities

  - Had the required expertise to do it.
  - Does not require collaborators (finally ☺)
  - Numerical study (all what I needed is a PC).
  - Combine a new technology (attractive to reviewers) with traditional investigation techniques.

Microsoft Office
Word Document

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Free writing

- Write in short bursts, 2~5 min each

- Begin writing and do not put pen down

  - Write all what you think of, even if it seems silly

  - No going back, crossing out or fixing typos

  - Write as fast as you can and don't stop to think of what you wrote

- Mark the important text with a highlighter

  - This text forms the bones of your writing

  - It highlights the more important concepts and ideas that you can build on in your proposal writing

Example of free writing text

* On Chip liquid handling:

- Should be done with simple method that doesn't require electricity or high tech gadgets.

- Examples:
  1) heating a closed gas chamber to increase pressure and initiate flow (can heating be done by breath effect or by touching the compartment to heat it up?)
  syringe?? What about hot tropical areas.

  2) Rolling a pen through (on top) of the channel to squeeze liquids out of channels in a certain order.
  - how can we control mixing sequence??
  Can chips be flexible themselves? - What about Magnus Jeger work? Read

  - Can channels be fabricated using Do lago principles??

  - What about proof of principles experiments??
    a) concentration gradient generation
    b) RBC squeeze through micro channels
    c) Schistosoma ?? → size is too big, check??

Building an outline

- Simple bullet lists of key ideas that forms your proposal

- Should indicate the flow of the argument

  - Statement of need.

  - Covering of previous literature (why your approach is different?)

  - Details of proposed solution/method/technique

  - Verification approach

  - Outcome and impact

- An outline helps you think broadly before getting consumed in the details of each section.

Team writing

- Joint application for funding is very common.

- Each member writes the part most relevant to his expertise. This distributes the labour of writing.

- PI is responsible for compiling all sections together and making sure writing style is coherent.

- Holding regular meetings for all team is essential:

  - Helps exchange ideas to perfect the proposal.

  - Make sure every one is following the deadlines (PI task)

- All members should review the final proposal before submission.

Set an early deadline

- Set an internal deadline at least one week before the grant deadline.

- Gives you a safety margin for unexpected circumstances (internet is down, Arabic abstract required, non-supported file format, Univ. President is away…)

- Allows you to put your "final" proposal aside for a couple of days and return to it fresh for final touches.

- You can set a series of internal deadlines for co-applicants to complete their sections

Sample work plan (deadline is May 1st)

Person responsible	Task	Deadline
Dr. Mohamed (PI)	Write first draft	15 March
All co-applicants	Expand relevant sections in first draft and send back to Dr. Mohamed	30 March
Everyone	Submit CVs (in required format) to Dr. Mohamed	10 April
Dr. Wael (co-applicant)	Gather information on required equipment	10 April
Dr. Wafaa (co-applicant)	Obtain letters of support from partners	10 April
Dr. Mohamed	Second draft to co-applicants	15 April
Everyone	Submit final comments to Dr. Mohamed	20 April
Dr. Mohamed	Final proposal complete	25 April

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General Tips

- The golden rule: "You never get the grant that you do not apply for"

- Only include researchers who will <u>contribute time and effort</u> to the project.

- Budgeting (specially equipment costs) needs time, so start early on your budget.

- Never wait until the last moment to submit your proposal (some electronic deadlines are non negotiable).

Conclusion

- *"The secret of getting ahead is getting started. The secret of getting started is breaking your complex overwhelming tasks into small manageable tasks, and then starting on the first one." (Mark Twain)*

- *"Don't get it right, just get it written."* (James Thurber)

Thank you

Sample work plan (deadline is May 1st)

Person responsible	Task	Deadline
Dr. Mohamed (PI)	Write first draft	15 March
All co-applicants	Edit and expand relevant sections in first draft	30 March
Dr. Mohamed	Second draft to co-applicants	7 April
Everyone	Submit CVs (in required format) to Mohamed	15 April
Dr. Wael (co-applicant)	Gather information on required equipment	15 April
Dr. Wafaa (co-applicant)	Obtain letters of support from partners	18 April
Everyone	Submit final comments to Mohamed	18 April
Dr. Mohamed	Final proposal complete	25 April

Outline

- Staying on top of literature
- Think of a gap
- Simple language
- Use lots of figures
- Style consistency
- Collaborations
- The golden rule (You will never get the grants that you do not apply for)
- Do not be scared of failures
- Suggest reviewers