What is a research proposal?

- **Statement of intent**

  – **Academically prepared to complete the research**
  – **Audience: peers, supervisors, examiners**

What is a research proposal?

- **A research proposal is your PLAN**
  - **It describes in detail your study**
  - **Decisions about your study are based on the quality of the proposal**
    - **Approvals to proceed by the Institutional Review Board**

What's the plan?

Importance of a research proposal?

Contract between you and your committee

1. Serves to protect the student

- Demanding additional requirements

2. Protects the committee from the student

- From delivering a degree of poor quality
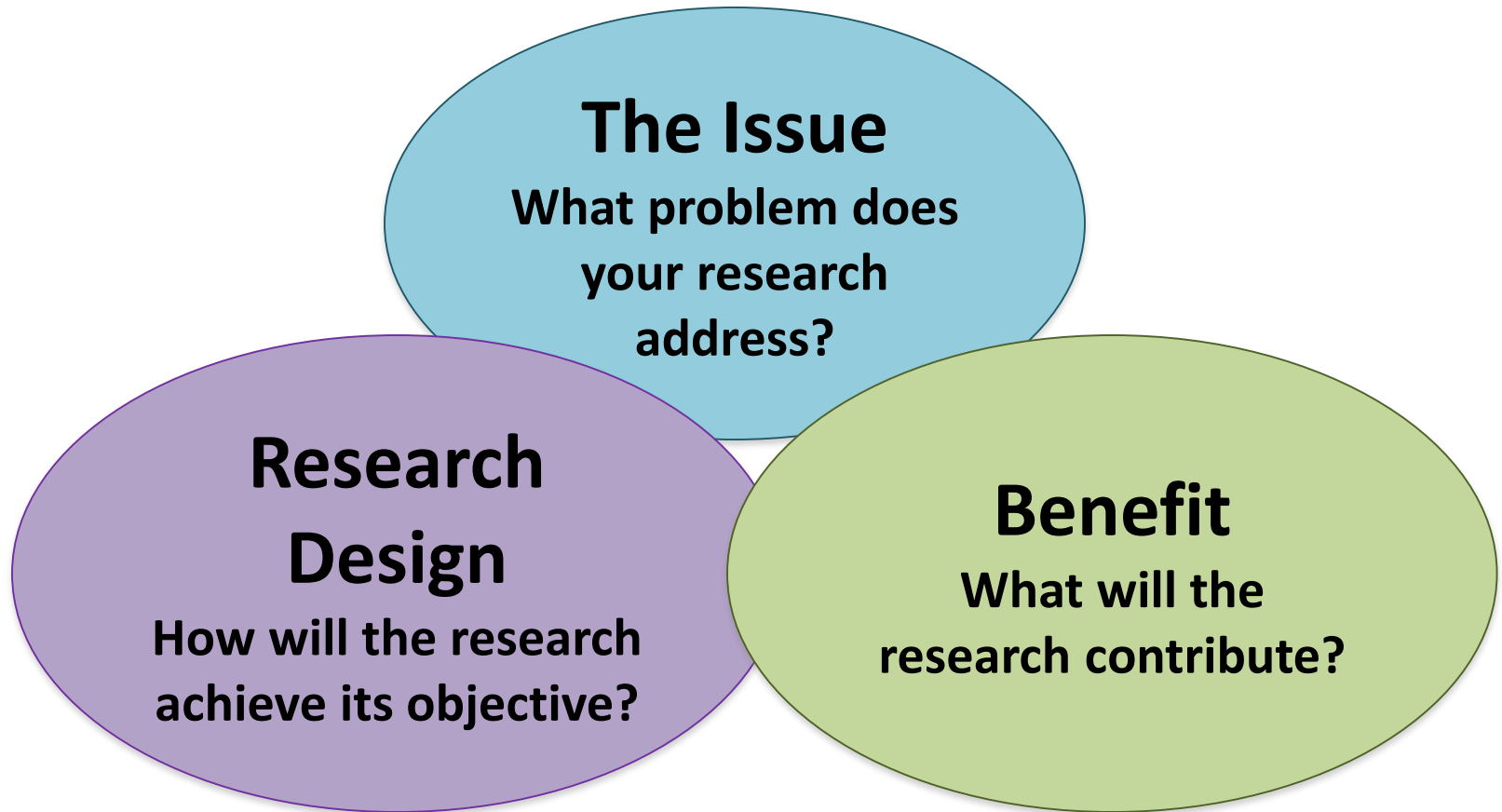
What are the essential ingredients?

The Issue
What problem does your research address?

Research Design
How will the research achieve its objective?

Benefit
What will the research contribute?

Figure adapted from MIT OCW

Research proposals make you:

OUTLINE steps in your proposed research

Provide yourself with intellectual CONTEXT

JUSTIFY your research

Be CREATIVE

THINK through your experiments

Anticipate potential PROBLEMS

Anticipate a realistic TIMETABLE

Figure adapted from MIT OCW

Getting started

- **Title**
- **Outline**
- **Literature Review**
- **Methodology**
- **Methods of data collection and analysis**
- **Ethical Issues**
- **Timeline**
- **Resources**
- **Outcomes**
- **Reference list**

- **Title**
- **Background**
- **Problem statement**
- **Aim and objectives**
- **Rationale and context**
- **Methodology**
- **Plan of work**
- **Resources / Support**
- **Outcomes**
- **Reference list**

Know the requirements BEFORE you start

Title

GPS address

–**Mini-abstract**

–**Clear**

–**Concise**

–**Subject 1st**

Problem statement

- **Short SO WHAT statement**

- **Purpose**
  - **Blueprint for your literature review**
  - **Focus your committee at the beginning**
  - **Keep them on track throughout your proposal**

Problem statement

- **E.g.**

  Malaria remains the most devastating infectious disease, particularly in Africa. One reason is that the parasite causing the disease is resistant to all clinically useful antimalarial drugs. We therefore have to devise alternative strategies to target the parasite.

Literature review

This is NOT just a summary of literature

Show how your project:

- **Literature SUPPORTS your hypothesis**
- **EXTENDS previous work**
- **AVOIDS previous mistakes**
- **IS UNIQUE to previously followed paths**

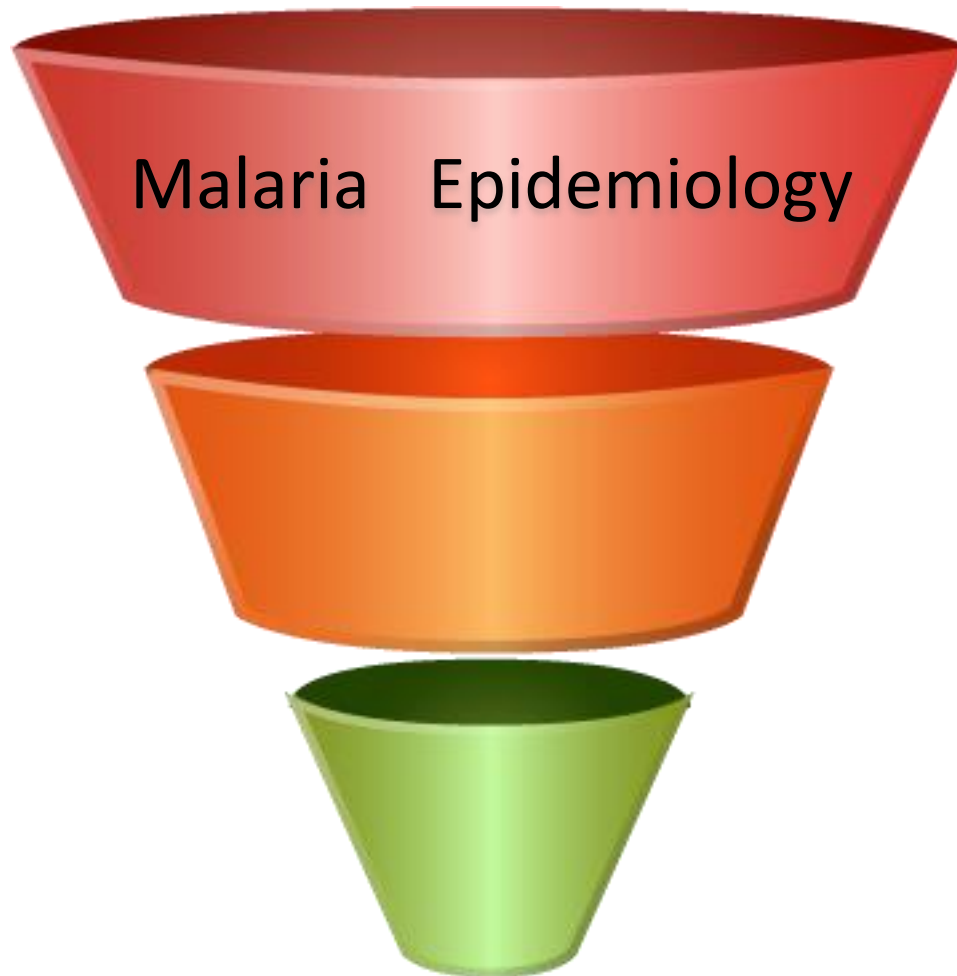# The narrative of a good literature review
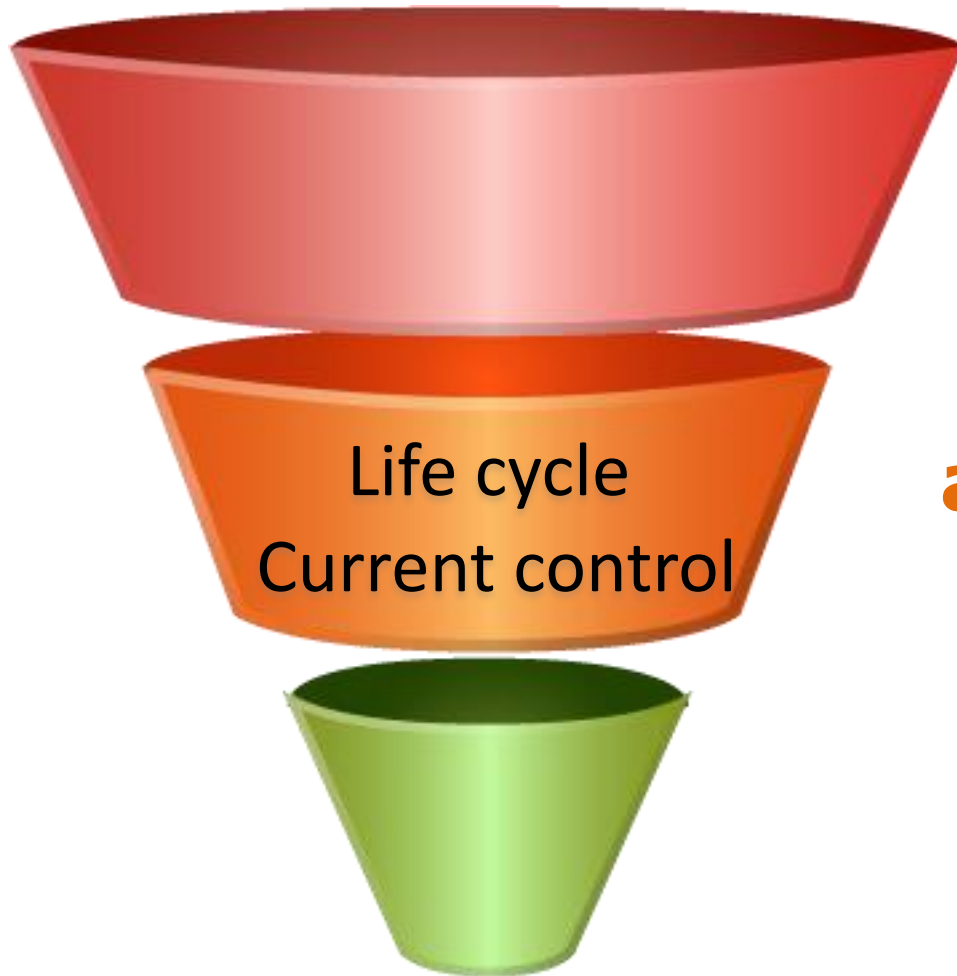
Reader knows

Reader doesn't know
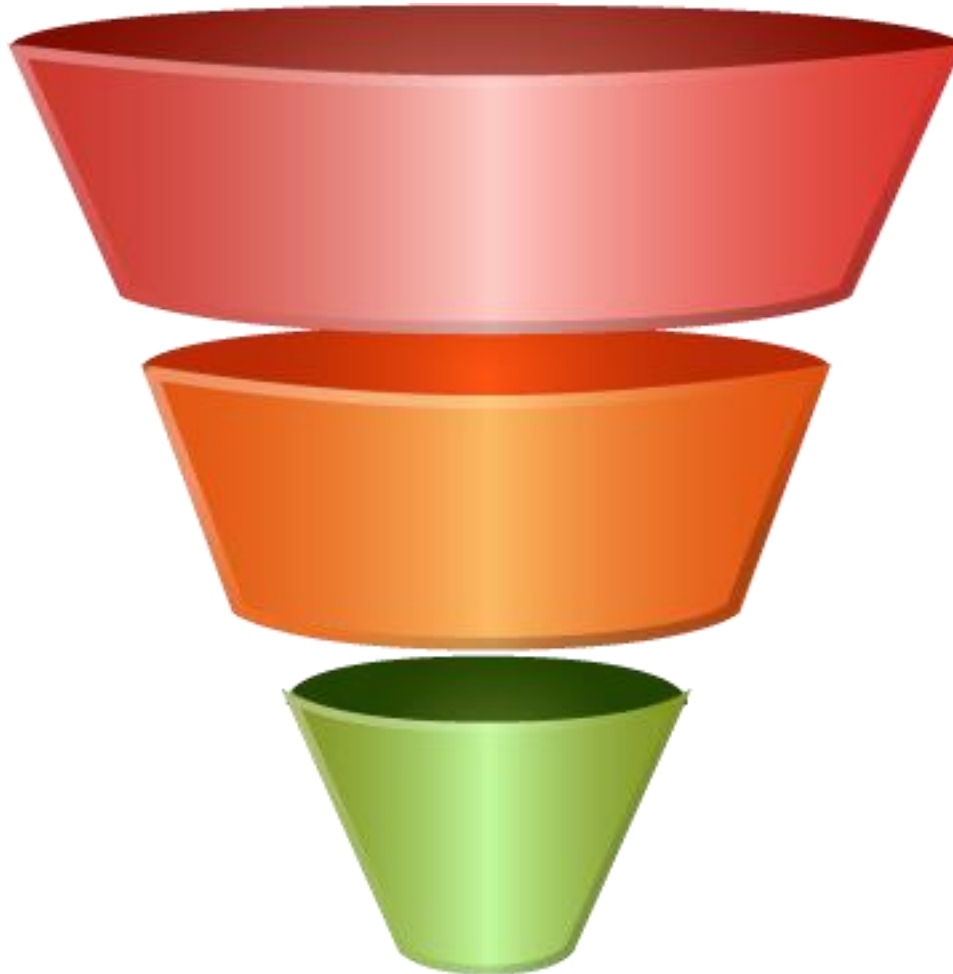
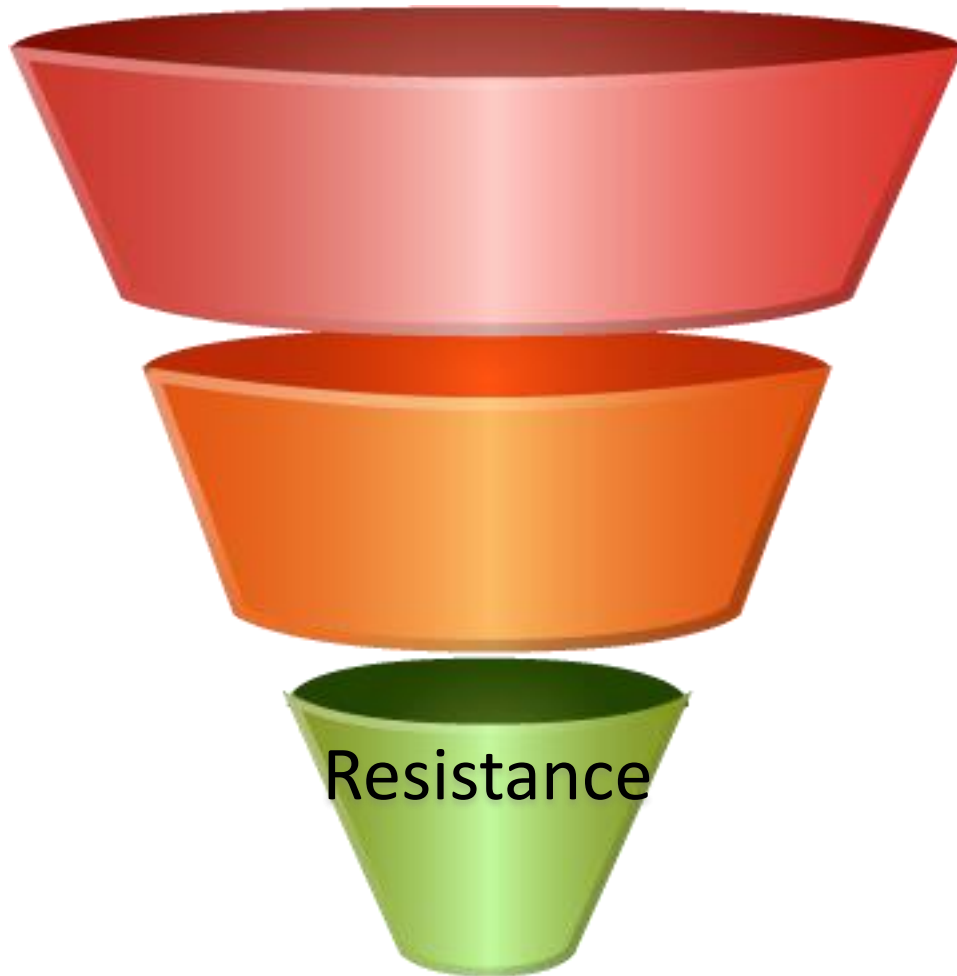# The narrative of a good literature review

Introduce the field:

Malaria   Epidemiology

broad focus

The narrative of a good literature review
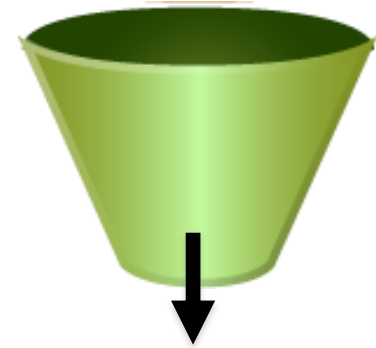
Life cycle
Current control

Focus on certain aspects in field of interest

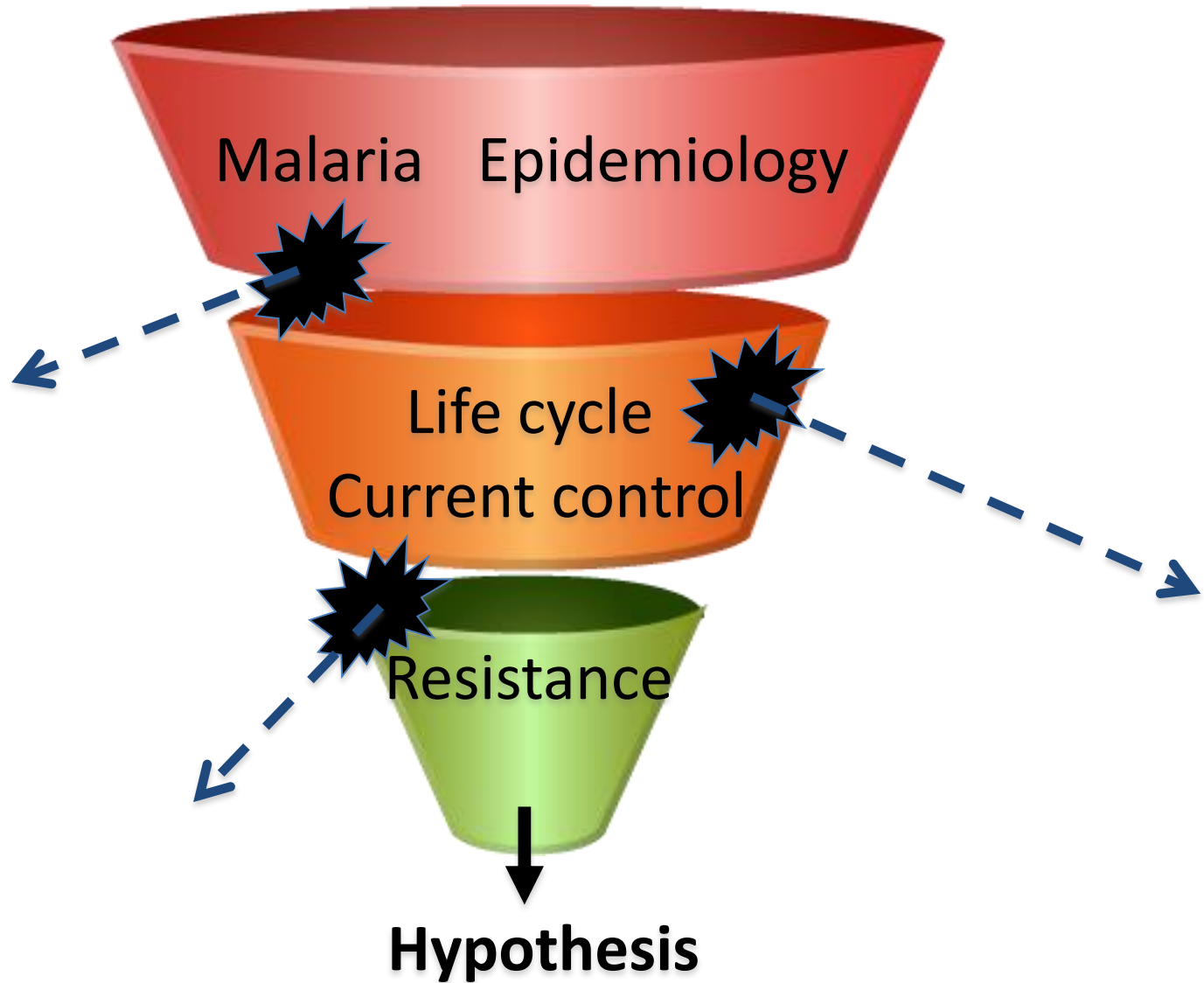# The narrative of a good literature review

Resistance

End with gap analysis
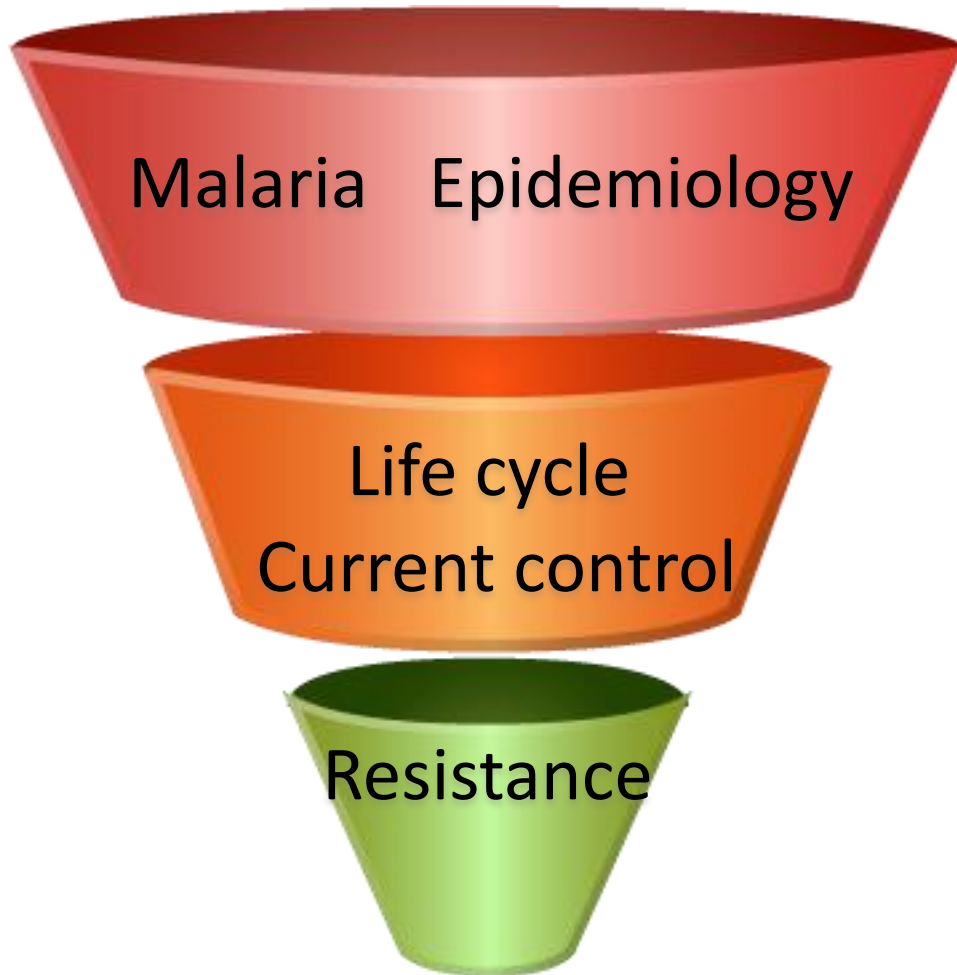
Purpose

- **Funnel point is your purpose:**
  - **The purpose can be framed as a research question or hypothesis**
  - **BE CONCISE**
    - **One sentence!!!**
    - **Solution to your problem**

Support the hypothesis

Malaria   Epidemiology

Life cycle
Current control

Resistance

Hypothesis

Make a list of references

Malaria   Epidemiology

Life cycle
Current control

Resistance

Internet/Referencing

- **Narrow down your search terms**
- **Peer-reviewed articles**
- **Current literature**
- **Review vs primary literature**

Endnote

Author

Wells, T. N.
Hooft van Huijsduijnen, R.
Van Voorhis, W. C.

Year

2015

Title

Malaria medicines: a glass half full?

Journal

Nat Rev Drug Discov

Volume

14

Issue

6

Pages

424-42

Start Page

Epub Date

2015/05/23

Date

Jun

Type of Article

Short Title

Keywords

Animals
Antimalarials/*therapeutic use
Drug Discovery/*trends
Global Health/*trends
Humans
Malaria/diagnosis/*drug therapy/*epidemiology

Abstract

Despite substantial scientific progress over the past two decades, malaria remains a
are required to overcome increasing resistance against artemisinin-based treatment
infection and target malaria species that transiently remain dormant in the liver. In this
grouped by the various target compound or product profiles, to assess progress and

Notes

Wells, Timothy N C
Hooft van Huijsduijnen, Rob
Van Voorhis, Wesley C
Review
England
Nature reviews. Drug discovery
Nat Rev Drug Discov. 2015 Jun;14(6):424-42. doi: 10.1038/nrd4573. Epub 2015 Ma

Research Notes

URL

http://www.ncbi.nlm.nih.gov/pubmed/26000721

File Attachments

Author Address

20

Plagiarism

- **Reference immediately after mentioning**
  - **Not end of paragraph**

- **ALWAYS identify source**

- **Summarise useful points**

Purpose
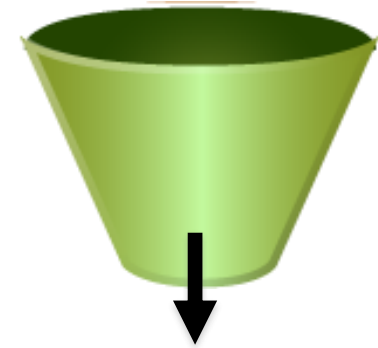
- **Funnel point is your purpose:**
  - **The purpose can be framed as a research question or hypothesis**
  - **BE CONCISE**
    - **One sentence!!!**

- **Leads directly into Aims and Objectives**

Aims and Objectives

The purpose of this research is to……

- **Aims**

  - short but **general statement of intent**

- **Objectives**

  - very **specific statements** that define the practical steps you will take to achieve your aim(s)

Methodology

- **Section used to JUDGE the validity of results and conclusions**

- **This section of your proposal has multiple parts**
  - **Instrumentation and infrastructure**
  - **Study groups and ethics**
  - **Access to samples**
  - **Data analysis**

- **Justify your method choice**
- **Show you understand the principles**
- **Prove feasibility of your study**

Experimental design
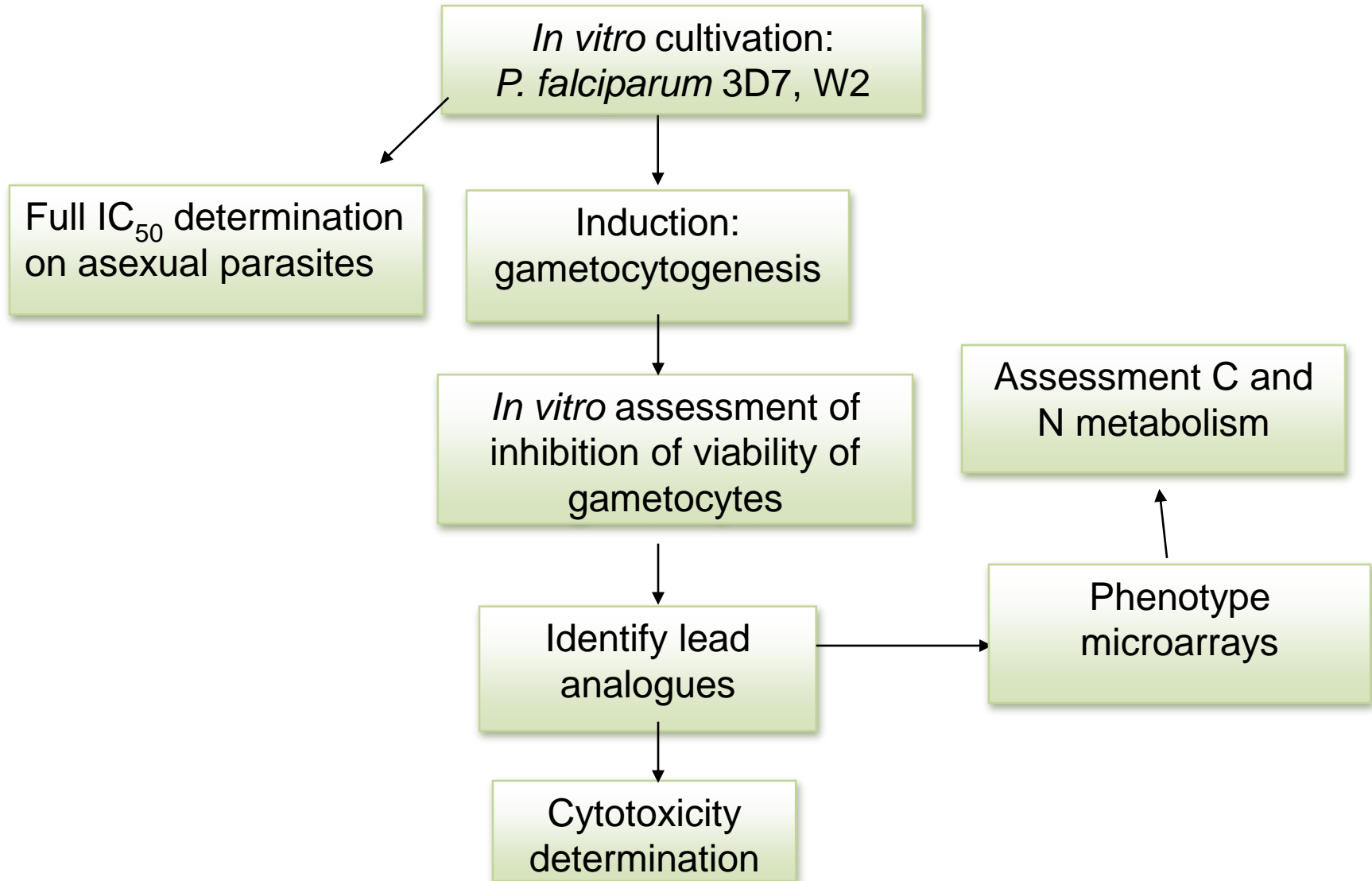
Timeline

- **Helps you keep your experimental design in the correct order**

- **Avoids "dead" time**

- **When building your timeline**
  - **Consult with other students in your lab that have done similar studies**

Budget

- **Give you an appreciation of research costs**
- **Prevents you from overspending!**
- **Provide specific explanations for:**
  - **Need for specific technologies**
  - **Need for other financial requests (e.g. conference, instrumentation, staff, bursaries etc).**
  - **Do you really need this kit?**

Outcomes

- **What do you expect the results to be?**
- **Measurable**
  - **E.g. you will get a degree**
  - **New patent / paper**
- **Qualitative**
  - **Contribute understanding to subject / new technology / application**

Revise and Edit

- **Back-up proposal everyday!**
- **Always print on paper and edit**
- **Use standard font**
- **Number your pages**
- **Read out loud**

Common pitfalls to avoid

- Forget to include table of contents
- Not connecting the proposed research to the literature review
- Not enough detail about methods
- Jargon & sweeping generalities
- Relying solely on your supervisor

Improving Your Odds

- **Know what the evaluation criteria will be and CHECK that you meet these**
- **Start with an outline**
- **Read approved proposals**
- **Once "finished" ask others to proofread**
- **Use diagrams to illustrate models**
- **Make sure your mentor approves it before you submit**

Evaluation of proposals

– **The aims/objectives are likely to be achievable in the given time period**

– **The rationale for the proposed study is reasonable**

– **The scientific design is described and adequately justified**

Any Questions?

Presenting your proposal

Purpose of a proposal presentation?

- **Persuading evaluators to support your research project**

- **Make your proposal compelling**

  - Convince audience that project is worth doing

  - Convince audience that you are capable of carrying it out

Preparing for the research presentation

- **Structuring your story**
  - **Summarise the content**
- **Preparing and giving the presentation**
- **Concluding your presentation**
- **Questions and answers**

Structure

- **Basic rule**
  - **Say what you are going to say**
    - **1-3 main points in the introduction**
  - **Say it**
    - **Give the talk**
  - **Then say what you said**
    - **Summarise main points in the conclusion**
  - **Don't try to build suspense and then unveil a surprise ending**

Stick to the Script

- **Prepare your material so that it tells a story logically**
  - Introduction/overview
  - Research question
  - Aim and objectives
  - Method/approach
  - Expected outcomes/summary

- **Prioritise the content**
- **Create continuity so that your slides flow smoothly**

  Your last point on one slide should anticipate the next slide

Know your Audience

- **Assume that your audience comprises of**

    - experts in your topic

    - intelligent generalists with exposure to your field

- **What do you want the audience to learn?**
    - **Think about this as you construct your talk**
    - **Edit your slides -- delete what is unnecessary, distracting, confusing, off point**

Questions to ask yourselves about slide design

- **Is everything on the slide readable?**

- **Do the slides have a good balance of text and figures?**

- **Is there something I can illustrate?**

Questions to ask yourselves about slide design

- **Have I chosen clear, specific titles that express the main point of each slide?**

- **Is the design/format of my slides consistent**

- **Do I have slide numbers?**

What Size Font to Use

Type size should be 30 points or larger:

18 point

20 point

24 point

28 point

36 point

AVOID USING ALL CAPITAL LETTERS
BECAUSE IT'S MUCH HARDER TO READ

* References can be in 12-14 point font

What font to use

Use a Sans Serif vs Serif font:

AaBbCc **Sans Serif**

AaBbCc **Serif font**

AaBbCc

What font to use

Use a Sans Serif font:

This font is Arial.

This font is Calibri.

This font is Comic Sans.

This font is Papyrus.

Lucida console

Fonts set the tone…

This font is Times New Roman.

This font is Courier.

This font is Didot

This font is Ravie

Use bold to make text clearer:

Arial vs. **Arial bold**

Calibri vs. **Calibri bold**

Powerpoint basics: Color

Many experts feel that a dark blue or black background works best for talks in a **large room**.

Powerpoint basics: Color

Dark letters against a light background

are best for **smaller rooms,** especially when

the lights are on for teaching

Avoid red-green combinations 8-10% of the human population is red-green colorblind.

Lots of people can't read this –
and even if they can, it makes your eyes hurt.

Powerpoint basics: Color

Other color combinations can be equally bad:

Other color combinations can be equally bad!

Powerpoint basics: Color

View your slides in **grayscale** to ensure that there is adequate color **contrast** in each slide.

Other color combinations can be equally bad!

Resources

- **http://www.cgd.ucar.edu/cms/agu/scientific_talk.html**

- **Micheal Alley:**
  - **Craft of scientific presentations**

Any Questions?