How to Plan and Carry Out a Research Project: The Essential Ingredients for Success

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Paradox #1 of academic medicine:
“Find the time”

Every day:

I know how much you care about your research, but don’t forget your patient care and teaching responsibilities.

Dr. Boss

The judgment day:

“Publish or perish!”

Committee for Appointments and Promotions

Next day:

I’m sorry your promotion was not approved, but you know that your weak point is your publications...

Dr. Boss
Essential ingredients of a successful project

- Innovative
- Important (impact on the field)
- Clear, attainable goals
- Motivated, well-adjusted team
- Appropriate, state of the art tools
- Available resources (subjects, equipment)
- Competitive for funding
- Publishable in high-impact journal

How do I come up with an idea?

- Wait patiently for the right idea to come to you
- Read current literature
- Listen to others present their work and see where you can contribute
- Ask your senior colleagues if there is something they have been interested in but haven’t had the time to work on

How do I develop my idea?

- Extensive literature search for concrete details
- Discuss with your peers (talking helps thinking)
- Write a short summary (writing helps thinking)
- Ask your peers to read and comment
- Be open to adding/removing/changing

Innovation:

1997:
Doctor, where is your stethoscope?

2002:
Doctor! Can’t you get a decent echo machine?

2007:
Edited for HIPAA compliance!!!

Innovation:

Paradox #2 of academic medicine:

“Is innovative publishable?” or “When innovative is controversial”
Statistics lesson 1

- Probability of events 1 and 2: $p_1$ and $p_2$
- Events 1 and 2 independent
- Probability of both events happening: $p_1 \cdot p_2$

When innovative is controversial

- $p_{\text{success}} = p_1 \cdot p_2 = 0.5 \cdot 0.5 = 0.25 = 1/4$
- Reviewer #1: $p_1 = 0.5$
- Reviewer #2: $p_2 = 0.5$
- Reviewer #3

Conclusions:
- Avoid controversial subjects...
- Focus on what is well known and is not likely to be disputed...

Available resources

- This is the best idea I have ever had, but after 3 years we have only seen 2 patients who fit the inclusion criteria...

- Make sure to:
  - Use realistic inclusion criteria
  - Offer monetary incentives to potential subjects

Diversify your research!!!

- Low-yield but low-risk studies that prove or confirm what is generally expected – "bonds" projects
- More risky and challenging studies that can potentially move your field forward – "stocks" projects
**Team is key!!!**

- Team consists of individual players...

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**Team:**

- "I work really hard until I’m finished…"
- "I’d love to help, but I have too much on my plate…"
- "I don’t care about anything, I just need another paper…"
- "I’m always busy w/something more important…"
- "I love talking about research…"
- "I love exploiting my great ideas…"
- "I’m important, therefore I’m a co-author…"

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**How do I know who is who?**

- Develop connections with the FBI
- Install video cameras throughout the lab
- Check their track record
- Trust your “gut-feeling” and try
- Learn from your mistakes

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**How do I make my team work?**

- Make the goals of the study clear
- Make your expectations clear
- Keep everyone updated and motivated
- Listen to their opinions and complaints
- Help resolve problems
- Replace non-performers
- Make artificial deadlines
- Be kind to people you work with!!!