

How to start and run a laboratory?

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What makes a great lab?

- New methods of producing scientific knowledge;
- Novel approaches to training researchers;
- The innovation and excitement that surrounds an emerging research field;
- The presence of gifted individuals with the personality and vision to make things happen;
- Positive and stimulating competition (the « Beatles paradigm »);
- *First rate scientists will attract first rate scientists; second rate scientists will attract third rate scientists*

Adapted from Bynum W Nature 490: 31, 2012

Singapore Statement

- Honesty in all aspects of research
- Accountability in the conduct of research
- Professional courtesy and fairness in working with others
- Good stewardship of research in working with others

(Based on the second World Conference on Research Integrity, Singapore, 2010)

Kleinert S Lancet 376: 1125, 2010

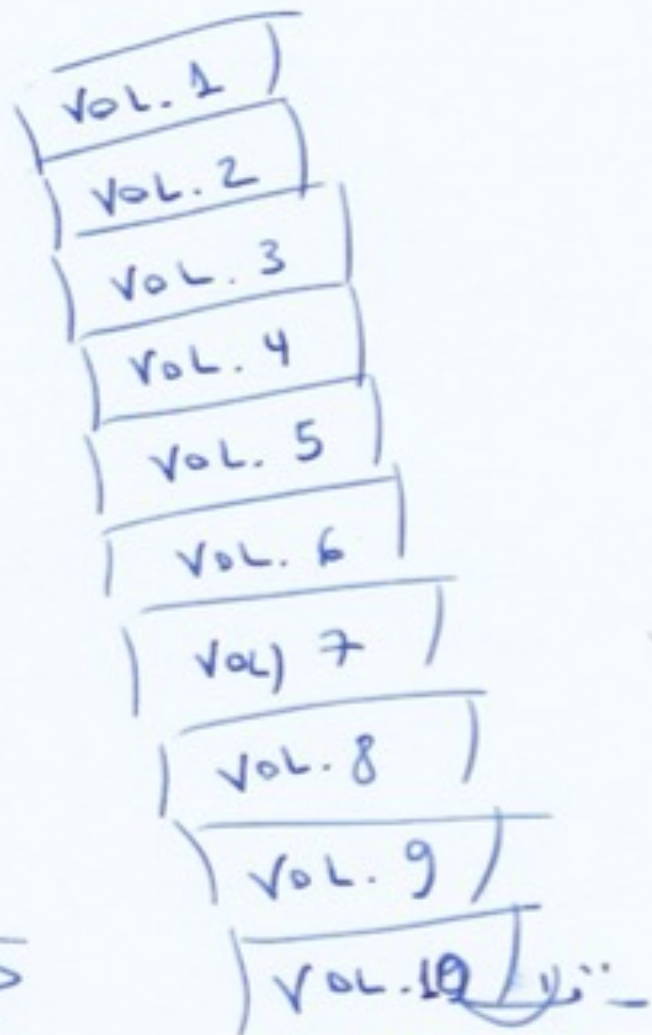
Core values for excellent science

- Honesty	64%
- Curiosity	60%
- Perseverance	34%
- Objectivity	21%
- Humility to evidence	19%
- Attentiveness	14%
- Scepticism	13%
- Courage	9%
- Collaborative	7%
- Meticulousness	5%

(Elite scientists in the USA were asked which 3 values they consider the most important)

LABORATORY
THE KING

LEADER -
STORY





LEARNING WITH
YOUR MENTORS
AND DEVELOPING
YOUR OWN STYLE

Role as laboratory leader (1)

- **Leadership = vision + relationship + tasks;**
- *Vision:* Where do you want your lab to go? To achieve what?;
- *Relationships:* Be always honest – do not overpromise, and deliver what you promise; Build and manage the team; Create an environment where people feel free to speak out, to give and receive feedback; Motivate and support lab members; Delegate responsibility + empower and support; Make fair decisions and manage conflicts; Communicate and listen; Be mentor to others while seeking your own mentors
- Obs: several concepts here and below adapted from:
<https://www.hhmi.org/sites/default/files/Educational%20Materials/Lab%20Management/Making%20the%20Right%20Moves/moves2.pdf>; Burroughs Wellcome Fund and Howard Hughes Medical Institute

INTERVIEW

LOI

PHONE FOR REFS.

???

VISIT TO THE LAB



SCREENING APPLICANTS

P.S. LAB MANAGER !!!
(MD-PhDs)

vi-

SCREENING APPL. (2)



Role as laboratory leader – feedback (1a)

- **Leadership = vision + relationship + tasks;**

Dealing with underperforming fellows:

- *Time it* – avoid discussions when both are angry;
- *Be specific and objective* – focus on first-hand specific data, actions and behavior (i.e. “we agreed on 3 expts and you did just 1”) and not on speculations or perceived intentions (“you don’t seem to care about your experiments”);
- *Present it in a constructive way* – Method to improve, rather than a punitive step (“the acid and the gold paradigm”);
- *Make sure it registers* – Ask the student to rephrase your comments

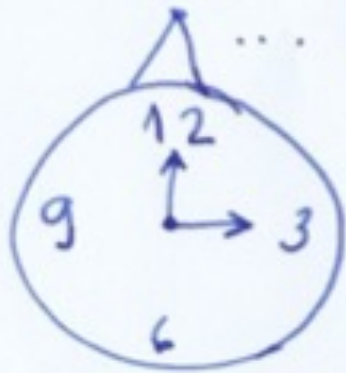
Role as laboratory leader – conflicts (1b)

- Leadership = vision + relationship + tasks;

Dealing with conflict:

- *Don't ignore it;*
- *Listen to both parties;*
- *Assess the gravity of the problem;*
- *Select a strategy that balances the gravity of the problem, time constraints and the general goals of the lab;*
- *If the conflict is with you – Receive and understand eventual negative feedback and learn from it, if appropriate. Keep also in mind the interest of the lab as a whole and that there are indeed impossible people to work with (Northern blot + unplugging examples).*

... LEADING BY EXAMPLE



... THE SUN IS
SHINING AND I
WILL PLAY
GOLF. WORK
HARD AND
WORK LATE!



Ji-

Role as laboratory leader (2)

- **Leadership = vision + relationship + tasks;**
- *Tasks:*
 - Design projects and determine time frames – follow up the project to assure that it is fulfilled (“the parrot on your shoulder”)
 - Create realistic budgets;
 - Write grants (a never ending story – try to make it fun...) and papers (complete your project and *write it!*);
 - Teach courses and clinical activities;
 - Juggle many different demands at once (keep your head above the water, and avoid the “hungry wolf phenomenon”)

Developing your lab project (1)

Pick an important problem:

- It is not easy to identify a project that is both important and solvable;
- If an opportunity comes along, take it – even if this was not in your original research plan;
- To make important discoveries you must ask important questions from the start;

Developing your lab project (2)

Read the literature but don't be crippled by it:

- You must be knowledgeable about prior work;
- ...but don't get trapped in doing variations of previous experiments;
- Fresh eyes and self-confidence are crucial – maybe you are right, and the just published paper in Nature is wrong;

Avoid the mouse trap! (see next figure)

TOM, TOM, THE DRUG
WORKS - THE PATIENT IS
AGAIN PRODUCING LOTS OF
C-PEPTIDE !!!

DISCARD IT!
IT FAILED TO
RESCUE DIABETES
IN OUR TRIPLE
TRANSGENIC NOD
MICE!



Jim

Developing your lab project (3)

Where do ideas come from? Or, how to be creative?

- *I really don't know, but....:*
- Read literature and listen to lectures outside your own area;
- Keep science on the back of your mind (“the eggplant and the RRHO story”) – when a new idea pops up, write it down;
- Develop the ability to “connect dots”, i.e. don't put your knowledge in closed compartments (this is also useful to answer questions in conferences and to design experiments based on these answers)

Driving your lab project

- Work hard – very hard – but keep time for other activities;
- Persistence is more important than brilliance;
- No project or career is immune from mistakes – don't be defeated by them;
- Science is moving fast – hold fast and enjoy the ride!

If needed, take a deep breath and switch subject or go for new methods

“I always describe science in the following way: that you are walking down a busy road and there’s a wall next to you. On the other side of the wall is a garden...a really wild garden. And every so often, the little door in the wall will open up, and you have to go through it. If you’re too busy going forward, you won’t see these little doors in the wall. I think a crucial part...is having the mental internal relaxation to take the time to notice. And when you see it, to do it, to go through it ...”.

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