


## Toward a Successful Graduate Career: the Stakes and Some Ropes

Tien-Hsien Chang 張典顯  
Genomics Research Center  
中央研究院  
Department of Molecular Genetics  
Ohio State University, Columbus, Ohio



## Graduate School: Why?

- By default: didn't know what to do
- Everybody is doing it anyway
- Otherwise, not possible to find a job
- To explore and fulfill personal interests and curiosities
- Toward establishing a professional career
- Earn a living and hopefully have some fun

## Ph.D. is Not for Everyone

- It is a long commitment (5 to 7 years)
- It does not automatically lead to a long-term job
- It often requires additional post-doctoral training (3 to 5 years?)
- Again, It does not automatically lead to a long-term job
- Not all Ph.D.'s are equal
- So, you have to do a **SUCCESSFUL** Ph.D. to have a better future

## Defining "Success":

Ph.D.? Secured Job? Principal Investigator?  
National Academy Sciences Member? Nobel Prize?

- **Subjective:** personal fulfillment
- **Objective:** peer recognition
  - praise and trust by supervisor
  - publications, awards, and patents
  - selected speakers in professional meetings
  - elected officers by professional organization
  - reviewing manuscripts for journals
  - journal editor; invited review author

## Becoming a Successful Ph.D.



Recognizing Reality & Problems

Careful Planning

## The Reality

- No longer undergraduate
- On the way to full independence
- Must perform according to professional standards
- Will be *constantly* judged by others almost solely on the basis of your performance

## Common Problems for Graduate Students

- Struggle to pass qualify exam
- Poor selection of mentor and lab
- Deteriorating relationship with mentor
  - Why (s)he expects so much? I have already worked so hard.
  - Experiments never work.
  - (S)he gave me a lousy project.
  - It's the problem of experiments. Not me.
  - (S)he hardly ever taught me how to do.
  - (S)he does not give me enough credits.
  - (S)he, a slave driver, is exploiting me.

## Recognizing the Problems

- Murky student/mentor relationship
  - Student vs. teacher (lowest stake)
  - Trainee vs. trainer
  - Disciple vs. master
  - Employee vs. employer (highest stake)
- Expecting the "expectations"
  - This project is YOURS!
  - Grow up! You got no one to blame!
  - Totally self-motivated (intellect. & lab)
  - Work ethic: fully devoted (for now)
  - Inquisitive and critical mind
  - Focused and risk-taking (boldness)

## Tackling the Challenges

- English Proficiency
- Essential On-Job Skills
  - Communication skills
  - Argumental process
  - Learning to take criticisms
  - Attentive to details
  - Organizational skills
  - Networking
- Intellectual Independence and risk-taking

## English Proficiency: Speaking and Writing

- Absolutely crucial for career success
- Adequate --> Fluent --> Sophisticated --> **ELOQUENT**
- Conscientious and life-time effort
- Submerge yourself in English
- Paying attention to others: conversation and seminars
- Read and memorize words and sentences in their contexts: *New York Times*, *TIME*, *Newsweek*, etc.
- Write & write: use what you learned

## Essential Skill: Communication

- Be articulate and to the point
- Saying things in several different ways
- Whole-body communication: importance of the body languages
- Ask to clarify: if you don't understand, ask again until you do
- Summarize and repeat to avoid misunderstanding

## Essential Skill: Developing Argumental Process

- Avoid just making a statement
- Provide reasons behind: always provide step-wise logical arguments
- Saying things in a variety of ways
- Listen to and understand the basis of counter-arguments
- Counter-arguments: provide your defense
- Ph.D. dissertation **DEFENSE**

## Essential Skill: Taking Criticisms

- Discard “face-saving” mentality
- Seek truth (i.e. true understanding)
- Summarize and reiterate to avoid misunderstanding
- Realizing disciple/master and trainee/trainer relationship
- Balanced with intellectual independence
- Learn how to deal with *REJECTION*



## Essential Skill: Attentive to Details & Organizational Skills

- Attentive to experimental details
- Think through every experimental detail, anticipate problems, explicitly predict experimental outcomes
- Document (notebook keeping) the experimental planning beforehand
- Document observations and alterations
- Crystal clear organization (thoughts etc.)
- Learn and practice organizational skills

## Essential Skill: Professional Networking

- Knowing the major players (and their associates) in the field by names
- Know their pedigrees well
- Communicate with them: phone calls and emails (Be bold and don't be lazy)
- Impress them (knowledge; speaking and writing skills)
- Attending conferences: make friends
- Talk to seminar speakers

## Intellectual Independence and Risk-Taking

- Be humble but confident (and show it)
- Have a **BURNING DESIRE** to show the world that you have something important and novel
- Develop self-discipline: read on your own widely and focusedly
- Not to be satisfied by doing the same old thing over and over again
- Seek for well-thought out risks, but not reckless risks
- Artfully balance wild dreams with reality

## Excessive Trust in Authorities: a Wide-Spread Symptom

- Sun, T.-T. (2004) Excessive trust in authorities and its influence on experimental design. *Nat. Rev. Mol. Cell Biol.* 5, 577-581.
- Lack of independent thinking
- Reflecting intellectual laziness
- “Escape from Freedom” Erich Fromm (2004)

## Handling Frustration & Despair

- It's perfectly OK to feel that way.
- It's OK to have self doubt.
- It's OK to get angry.
- It's OK to vent your frustration and anger **PRIVATELY** to close friends, even better to your comrades.
- You then must quietly face yourself, inspect your feeling, **WRITE** it out, have a plan to get over it, and move on.
- If nothing works, seek for professional helps.

## Communicating with Your Mentor

- ASK explicitly what are expected:
  - Work hours: weekends?
  - Vacation policy
  - Lab responsibilities
  - How much is expected on your own for problem solving?
  - What are the criteria for Ph.D.?
- Build candid & mutually agreeable rapport: avoid guessing, be friendly frank, identify & solve problems ASAP.
- Keep your mentor well informed: be honest, avoid hiding (failed experiments, un-announced take-off, etc.)

## Establishing a Rigorous and Consistent Working Schedule

- 60 h per week consistently
- Establish a ***PRODUCTIVE*** schedule
  - 8:30—9:30 planning experiments; book keeping
  - Keep fully occupied: overlap your experiments
  - Read literature during experimental breaks
  - 5:30p—7:00p out running, dinner, shower
  - 7:30p—10:00p back in the lab
- Stay focused in the lab: ***AVOID*** personal phone calls, emails, non-science activities
- **Discipline, Discipline, Discipline**

## Document Your Accomplishment

- Prepare seasonal progress report for yourself and your mentor
- Self reflection on all aspects
- Seek for recognizable awards: travel fund, meeting abstract, workshop talk, platform talk, invited talk, volunteered talk, colloquium competition, university-wide competition, fellowship, etc.
- Strengthen your CV
- Significant publications: currency for your success

## ALL in ALL...

- Knowing ***WHY*** you are there
- Set short-term (yearly), well-defined, realistic, measurable goals
- Focus and work hard toward goals
- Evaluate progress
- Learning all the time
- Communicate (!) and stay connected
- Impress people (mentors & other scientists)
- Build comradeship (forming supporting group)
- Have fun, take some risks, and enjoy the process

## Succeeding in Science: Rules of Thumb by Jim Watson



**Succeeding in Science: Rules of  
Thumb by Jim Watson**

**Rules #1**

**To succeed in science, you  
have to avoid dumb people.**

**Succeeding in Science: Rules of  
Thumb by Jim Watson**

**Rules #2**

**To make a huge success,  
you have to be prepared to  
get into deep trouble.**

**Succeeding in Science: Rules of  
Thumb by Jim Watson**

**Rules #3**

**Be sure you always have  
someone up your sleeve  
who will save you when  
you find yourself in deep  
s--t (= shit).**

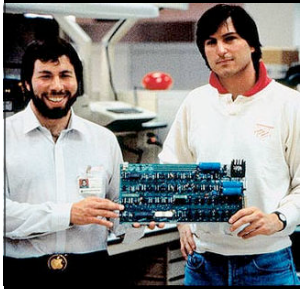
**Succeeding in Science: Rules of  
Thumb by Jim Watson**

**Rules #4**

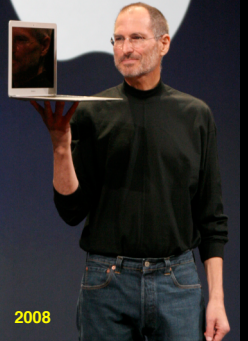
**Never do anything that bores  
you.**

**Have fun and stay connected!**

**You Got to Find Your Love**  
— Steve Jobs 2005



1976



2008

**Connecting the dots**

**Love and Loss**

**Death**

**Stay Hungry**

**Stay Foolish**

**To succeed in graduate  
school, you must first have  
some *PASSION*  
&  
Thoughtful planning  
&  
Hard works**



**Thanks!**

**Wish you a good  
success in your  
graduate career!**

