

making the most of your graduate training



session breakdown:

1. strategies for personal growth



2. strategies for career growth

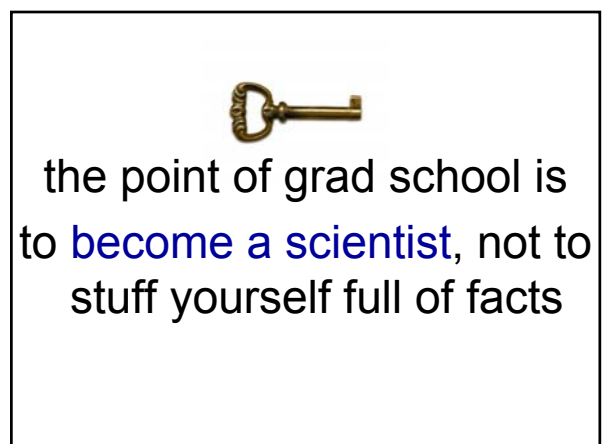
introductions:

- jennifer gardy
 - ubc microbiology & immunology postdoc
 - occasional television host
- sasha fedorova
 - sfu computer science assistant professor
- and you!
 - name
 - department
 - where are you in your graduate program?

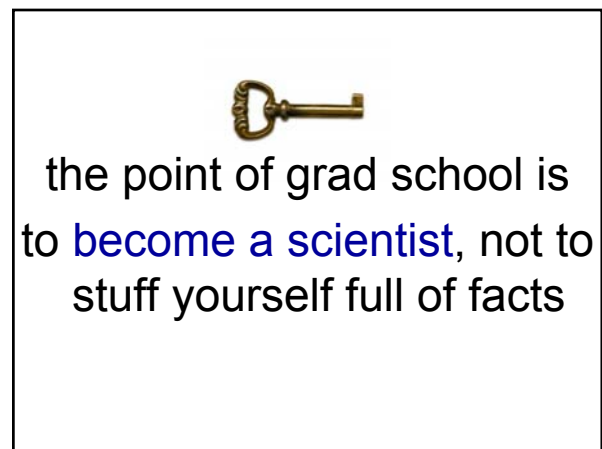
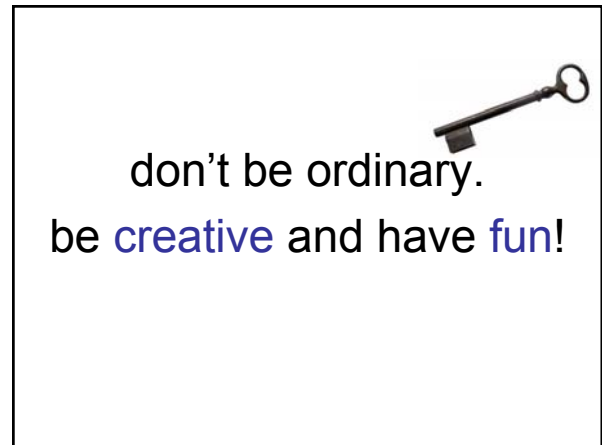
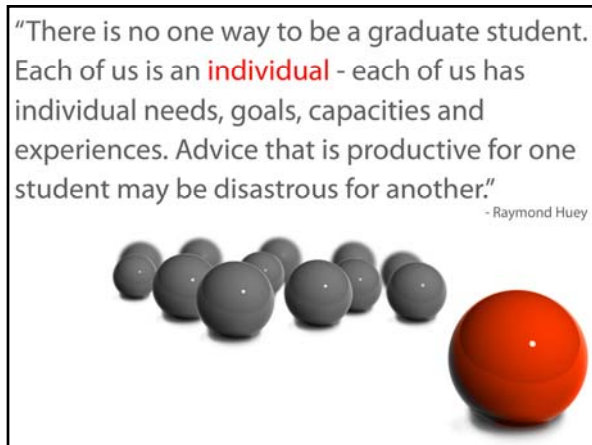
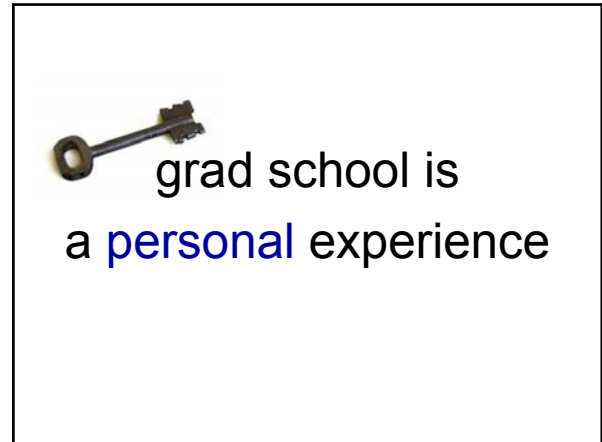
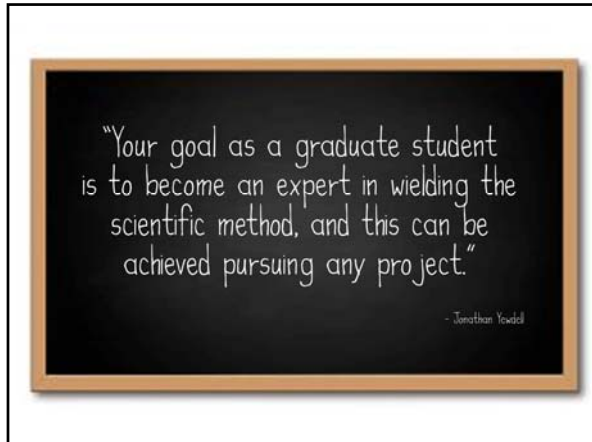


strategies for personal growth

keys to success



the point of grad school is to **become a scientist**, not to stuff yourself full of facts



multiple intelligences (Gardner, 1983)

- 8 intelligences as defined by certain criteria:
 - can be isolated (e.g. brain damage, autism)
 - displays a growth pattern
 - has core operation & symbol system
- each person has a unique “cognitive profile”
- different intelligences learn in different ways
- activities appropriate for one intelligence may not work for all

example from Gardner



survey results

what are your **top 3** intelligences?

teaching yourself: finding information

- find & read papers, other reports:
 - literature searches, scanning abstracts and intros from key journals, subscribe to eTOCs, lab archives, previous students' theses
 - lab web pages (intro page, old presentations), conference websites' abstract listings, animations/graphics
- interact with your scientific peers
 - brainstorming with a supervisor, discussion groups, Facebook

linguistic naturalist logical visual interpersonal

teaching yourself: learning key info

- translate key facts into a form that works for you
 - sentence, mnemonic, map, formula, drawing, etc...
- develop your own fact filing/storage system
 - binders of important papers
 - Connotea – online paper organization tool
 - bookmarks for useful sites/software
 - notebook with your own selected facts
- test yourself, review notes when needed

linguistic musical logical visual

in developing insights...



don't be ordinary.
be **creative**, have fun!



- old dogs can learn new tricks**
- take mental health breaks to generate seeds (and stay sane!)
 - plant seeds, water them with exposure to different people and environments
 - play with your ideas – don't limit yourself with practicality or disciplinary boundaries
 - don't be afraid of failure

collaboration...

**saves time & sanity.
makes better science.**

*new perspectives, new ideas,
new techniques, new connections.*

- tips for collaborating**
- see your supervisor first
 - they know who's doing what within and outside lab
 - are aware of legal/political issues
 - best person to set up first meetings
 - browse department web pages for people
 - learn to speak their language
 - maintain an equal relationship
 - meetings, papers, authorship

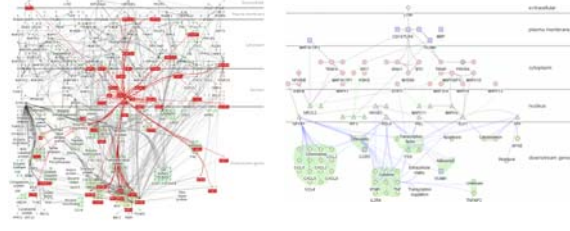
communication...

**if you can't communicate
your work, you're toast.**

the communication litmus test

**you should be able to
explain your project to a
10th grader in 10-20
seconds/1-2 sentences**

i use computer science techniques to draw maps of the relationships between the genes and proteins of the human immune system. my co-workers and i use those maps to understand immunity and look for the best genes or proteins to target with new drugs to treat infection.



challenge!

find me later and tell me your 10-second research synopsis!



brevity is the sole of wit

- have a central message and keep it at about that level
- broad audience (e.g. conference, seminar to a different department) = keep the whole talk at about that level
- focused audience (e.g. journal club) = a bit more detail, but a basic central thesis

people will only remember one thing from a science talk

make your text readable from the back of a large conference hall



An Unfortunate Example

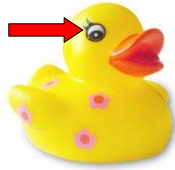
- I wish I was making this up, but I saw a talk once where the slides looked exactly like this
- The text was way too small, and it was all crowded together in the middle of the screen, even the headline
- To make matters worse, it was a math talk and was full of tiny little equations
- And, just as I am doing right now, the presenter read every sentence, word for word, off the screen
- Which brings me to my next point: Just because it's readable doesn't mean you should read it

tv wisdom

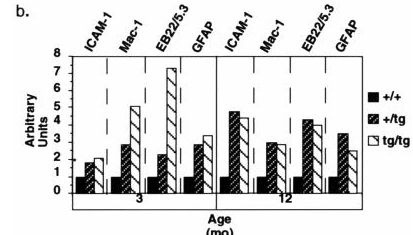


say a duck, show a duck

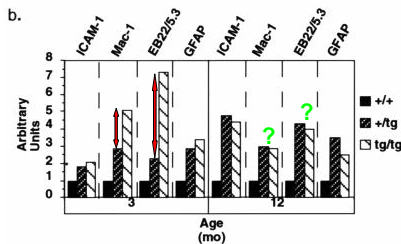
tv wisdom, science version



say duck eye, point to duck eye



RNA isolated from the brain of nontransgenic (+/+), heterozygous GFAP-IL6 (+/tg), or homozygous (tg/tg) GFAP-IL6 transgenic mice. While cerebral expression of the ICAM-1, Mac-1, EB22/5.3, and GFAP genes was increased in GFAP-IL6 mice, quantitative analysis revealed a marked difference in the levels of expression of the Mac-1 and EB22/5.3 genes between heterozygous and homozygous GFAP-IL6 mice at 3 months but not at 12 months of age.



Difference in Mac-1 & EB22/5.3 expression between heterozygous and homozygous transgenics at 3mos. of age.

Difference is not present at 12mos. of age.

avoid 'are we there yet?'



provide an outline

- 1. intro  m&m
- 2. results  fruit drop
- 3. discussion  chocolate
-  jellybean

colour or **font decoration** makes **key points** stand out against the rest of the text

NDS/A

no damned
symbols/acronyms

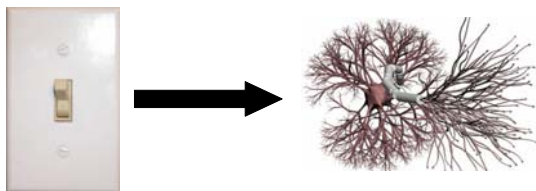
explain your topic
to a guy at a bar



The receptor tyrosine kinase for NGF, gp140TrkA (where TrkA is a receptor tyrosine kinase for NGF, a product of the *trk* oncogene) suppresses programmed cell death and activates the expression of the genes associated with neuronal differentiation by signalling through Shc/Grb2/m-Sos/Ras/Raf-1 [where Grb2 is the growth factor receptor-bound protein 2, Shc is an SH2 (Src homology 2)-containing adaptor protein that binds Grb2, m-Sos is a mammalian homologue of the Drosophila son of sevenless gene (a GDP-releasing factor of Ras) and Raf is the serine/threonine protein kinase family downstream of tyrosine kinases and upstream of MEK, PLC-γ1 (phospholipase C-γ1)/PKC (protein kinase C), Gab1 (Grb2-associated binder-1)/PI3K (phosphoinositide 3-kinase)/Akt (a product of the *v-akt* oncogene ≡ protein kinase B) and Crk/C3G/Rap1/B-Raf (where Crk is an oncogene, adaptor protein containing SH2 and SH3 domains and C3G is a guanine nucleotide-exchange factor that activates Rap1)

nerve growth factor initiates
neuronal differentiation through a
receptor tyrosine kinase, leading to
a complex signaling cascade

nerve growth factor flips a switch,
signaling the cell's machinery to
start making nerve cell proteins.



anticipate questions.
prepare for them.

never EVER go over time.



"Your goal as a graduate student is to become an expert in wielding the scientific method, and this can be achieved pursuing any project."

- Jonathan Yowdell



grad school is
a **personal** experience



know who you are



know where you're going



don't play to stereotypes

know who you are

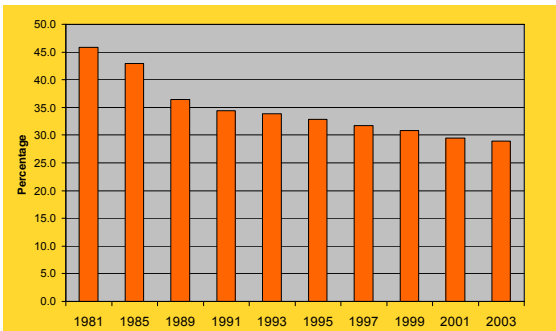
- know your work ethic
 - set goals and stick to them (D/W/M/Y)
 - know when/why you procrastinate
- recognize when you're in a trouble spot
 - take some time off or an LOA
 - changing advisors/projects is **OKAY**
- stay positive
- be independent

know where you're going



all roads do not lead to PI

% of US Biomedical Science PhDs Holding Tenure or Tenure-Track Positions



Source: <http://sestat.nsf.gov/>

where do the other ~75% go?



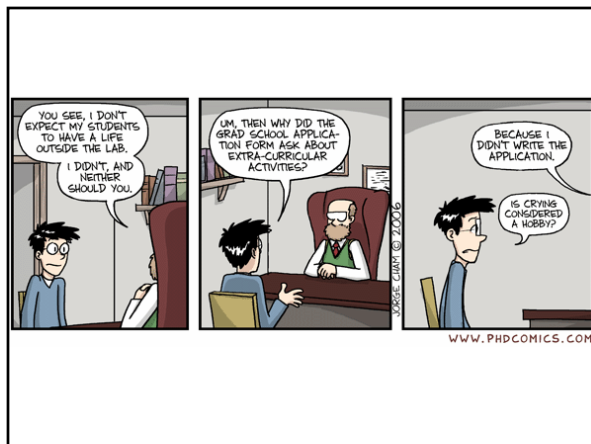
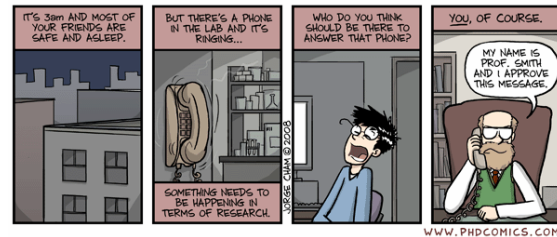
- government
 - research, policy, funding agencies
- industry
 - every kind of job under the sun
- other academia
 - teaching position, RAs, administration
- other fields
 - business (MBA), law, health care, media

know where you want to go

- structure extra-curricular activities accordingly:
 - conferences
 - teaching opportunities
 - professional organizations
 - clubs
 - seminar series
 - outreach activities
- seek out mentors
 - talk to your advisor about your interests!



don't play to stereotypes



"Scientific talent is not a single parameter, but a complex mix of innate skills and learned abilities..."

$\int_a^b f(x) dx = \dots$

...There is no one path to success, and each successful scientist has unique combinations of strengths."