

## What makes a good PhD student?

### Some tips for PhD students.

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Doing a PhD should be fun and rewarding, because you can spend all your working time discovering things and pursuing ideas — and getting paid for it, without any administrative responsibilities. Those who stick with a career in science do so because, despite the relatively poor pay, long hours and lack of security, it is all we want to do.

Unfortunately most new PhD students are ill-prepared, and as a consequence very few will fulfill their aspirations to be independent scientists. The main reasons for this are the 'grade creep' inherent at most universities, making it difficult to identify the really talented first-class graduates from the rest, and the pressure on universities to graduate as many PhD students as possible. The consequence is that we enroll far too many of them without telling them clearly what doing a doctorate should entail. We therefore set ourselves, and the students, on a path of frustration and disappointment.

So what should we be telling prospective PhD students?

- Choose a supervisor whose work you admire and who is well supported by grants and departmental infrastructure.
- Take responsibility for your project.
- Work hard — long days all week and part of most weekends. If research is your passion this should be easy, and if it isn't, you are probably in the wrong field. Note who goes home with a full briefcase to work on at the end of the day. This is a cause of success, not a consequence.
- Take some weekends off, and decent holidays, so you don't burn out.
- Read the literature in your immediate area, both current and past, and around it. You can't possibly make an original contribution to the literature unless you know what is already there.
- Plan your days and weeks carefully to dovetail project work so that you have a minimum amount of downtime.
- Keep a good lab book and write it up every day.
- Be creative. Think about what you are doing and why, and look for better ways to go. Don't see your PhD as just a road map laid out by your supervisor.
- Develop good writing skills: they will make your scientific career immeasurably easier.
- To be successful you must be at least four of the following: smart, motivated, creative, hard-working, skilful and lucky. You can't depend on luck, so you had better focus on the others!