Funding constrains PhD production

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It was with great interest that I read the whole front section of the Nov/Dec issue (S Afr J Sci 106(11/12)) – and kudos on making it much more readable, by the way – as it addressed a number of misgivings I have had about both the government's approach to increasing the number of PhD graduates in South Africa, and the Academy of Science of South Africa's report, *The PhD study* (ASSAf, 2010).

This finding informs my opinion, which is reinforced by the Nov/Dec editorial, that the single biggest obstacle to producing more PhDs in this country, as it is for producing quality scientific publications, is funding. I am certain that, in the fields of molecular biology and biotechnology at least, significantly increasing the funding available for student support and student projects would significantly increase graduate output. National Research Foundation (NRF) funding of student bursaries is grossly inadequate, which is partly why we don't have more graduate students: why work for a pittance for several years to possibly qualify for a not-very-well-paid job afterwards, when you could have the same or better job now? It costs me at least R100 000 per year to support *one* postgraduate student doing modern molecular biotechnology – and that is just for lab costs; personal support costs an additional R70 000 – R90 000 per year. My problem in supporting postgraduate students, therefore, is more financial than supervisory; I am sure that supervisors could cope with double the number of postgraduate students we have now – *if* we were funded appropriately.

Brenda Wingfield also makes a good point when she invokes the '10 000 hour' rule: the support time allowed for PhDs (and MScs, incidentally) by the NRF is simply insufficient. My students routinely take at least four years to do a PhD, from registering with an Honours, and often also if they have a Masters. Again, doing an MSc can take 18 months - or it could take 3 years, if your botanical project study area burns down, for example, as has happened to at least one student I know. Arbitrary time limits on degrees do no one any favours – except possibly bookkeepers.

Like Musa Mlambo (Commentary, S Afr J Sci 2010;106(11/12):7–8), I am most concerned that the authors of the ASSAf report suggest that we quickly increase numbers of PhDs in South Africa by sending students overseas for training. This suggestion is wrong-headed on a number of levels, but primarily because we are simply not using the capacity for training we have in this country. South Africa is one of the cheapest countries for quality graduate student training: I challenge anyone to show me lower PhD course fees and subsistence requirements for any country with a comparable academic standard. As we have a wide and respected science training base at a number of institutions here in South Africa, why would we send students outside the country to be trained at great expense, when we could train them at least as well here, and at a *far* lower cost? The suggestion to train students overseas would make sense only for training that is impossible to get locally, or for the use of facilities that do not exist in South Africa, for example, in places like CERN and Los Alamos.

I have commented previously that NRF stands for 'Not Real Funding'. In the light of the new initiative from the Department of Science and Technology which will pump R250 million into increasing the number of PhDs, but limiting postdoctoral funding to R11 million, perhaps I should change that to 'Not Realistic Funding'. Postdocs are at the cutting edge of research and are potentially far more productive in terms of publication and training others than academics and researchers without PhDs; young researchers are probably better served by being absorbed into and mentored in a bigger well-funded research group headed by a senior researcher, than by having money thrown at them.

This brings me to a simple solution to the 'PhD problem': simply fund the people who supervise good-quality PhDs to a considerably higher level, and dispense considerably larger PhD and postdoctoral bursaries for longer. This approach would be good for senior scientists, good for their junior colleagues, good for students, good for science – and good for South Africa.