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Towards a good work-life balance: 10 recommendations from 10 Nobel Laureates (1996–2013)

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Abstract

It can be hard to get the work-life balance right in research and academia. There is no one-size-fits-all recommendation for 'the best work-life balance', as we all have different work-life priorities. But for scientists, at least, Nobel Laureates' thoughts on the matter may prove useful. As such, we describe and discuss, ten recommendations toward a good work-life balance voiced by ten 1996-2013 nobel laureates.

"[Peter Medawar] told his young bride, pretentiously, that she had first claim on his love, but not on his time, made her buy her own wedding ring and often also her own Christmas presents. So preoccupied was he with his work that Jean had to be both father and mother to their four children".

-Max Perutz (Perutz 2002)

INTRODUCTION

A good work-life balance is key to living healthily and happily and working effectively (Overbaugh 2011; Erren *et al.* 2007) but it can be hard to get right in research and academia. Clearly, there is neither a one-size-fits-all answer for 'what is the best work-life balance?' (Guest 2002) nor an agreed definition of the term (Kalliath and Brough 2008). This is perhaps not surprising, since everyone will have a different perception of what balance is needed and how to strike it. Indeed, different work-life priorities will come into play (Kalliath and Brough 2008). For scientists, at least, Nobel Laureates' thoughts on the matter may prove useful. As such, herein we complement practical suggestions toward a good work-life balance in research (Maestre 2019) using a personalized approach: the premise being that what works for Nobel Laureates may work for other scientists as well.

We base our recommendations (Erren & Nise 2010) on "Insights from Nobel Laureates, for scientists everywhere" from the Nobel Prize Inspiration Initiative (Nobel Prize Inspiration Initiative). From the "Work-Life Balance" video category (Nobel Prize Inspiration Initiative: Insights from Nobel Laureates, for scientists everywhere), we

COMMENTARY

distil essentials from what Nobel Laureates voiced when specifically asked. While work-life realities can appear very skewed (see quote above), Nobel Laureates leave no doubt that balance – whether it involves amalgamating work and life or keeping them distinct and weighted as per individual needs – is conducive to, and important for, success.

As an editorial feature, the recommendations take the form of quotations, as the Nobel Laureates' insights speak for themselves. Recommendations may be grouped according to work [Recommendations 1, 2, 3, 9, 10], family [Recommendations 4-7], and hobbies [Recommendation 8]. Clearly, none of the recommendations *per se* is sufficient nor a *conditio sine qua non* for striking a good equilibrium but being aware of the importance of appropriate work-life balance *is*. With that premise, readers may find it useful and perhaps motivating to see that and how several Nobel Laureates made their discoveries whilst noting the importance of striking a balance between work and life.

RECOMMENDATION 1
WORK = PLAY

Oliver Smithies – Nobel Prize 2007 for discoveries of principles for introducing specific gene modifications in mice by the use of embryonic stem cells:
Really, I'm not working. I don't work – I play! I do what I like. It happens to be experiments and that isn't work, that's enjoyment. So there is no difficulty about that, the problem is stopping doing it. You better go home and have something to eat. You can't go on all night. Now that's the problem: how to stop because it's so enjoyable.

RECOMMENDATION 2
WORKING LONG HOURS IS NOT ALWAYS NECESSARY: ORGANIZATION = KEY

Paul Nurse – Nobel Prize 2001 for discoveries of key regulators of the cell cycle:
You very, very seldom work efficiently when you work very long hours. …. I've seen people work many hours in my lab [and] are less efficient than somebody who has got [e.g.] children. A young mother who works seven or eight hour can be just as effective – they are just better organized.
Randy Schekmann – Nobel Prize 2013 for discoveries of machinery regulating vesicle traffic, a major transport system in cells:
It [long hours in the lab] looks good but it doesn't necessarily get more done. …. I worked that way when I was a graduate student – that's for sure, but late at night I was often playing scrabble with my buddy in the lab I was in. I would much rather have someone who had planned their day in advance, worked 9 to 6 or something like that, and got it done without going off and doing something in the middle of the day.

RECOMMENDATION 3
DON'T JUST DRUDGE – LET YOUR BRAIN IMAGINE NEW THINGS

Peter Doherty – Nobel Prize 1996 for discoveries concerning the specificity of cell mediated immune defence:
You need to take time off. You need time away from it. It's often the time away from it [when] you get new ideas and you come up with different ideas of thinking at things. … Often, when you switch off is when you get the insight about what this is actually about … you can sometimes try too hard on a problem and if you just put it aside sometimes the insight will come to you while you are doing something else – you are in the shower or you are going for a walk or on the beach … so it's important to take time out. It's important to be not just drudge … don't work all the time. It can be very counterproductive to work enormous hours all the time. You just can get very dull and very tired.
Paul Nurse:
If you work too hard you will keep going in the same direction and one big advantage of taking some relaxation to go off and go and walk for a day, not to work all the time in the lab and with your books … it makes your brain calm down and then you come and look at it freshly. People who work just hard all the time never take off the pressure and it's when you take off the pressure then you can imagine new things. So if you really want to be good you mustn't work too hard.

RECOMMENDATION 4
FAMILY = REDUCED STRESS

Shinya Yamanaka – Nobel Prize 2012 for discovering that mature cells can be reprogrammed to become pluripotent:
Being a scientist is very stressful …. Very luckily, I have two daughters and [watching them] growing up was [a] wonderful thing in my life …. So of course I spent many hours in the lab but when I was a post-doc they were very small so I went back home for dinner and spent one or two hours and then I came to the lab to complete my experiments. On weekends, I spent a couple of hours with them in the morning but after that … in the late afternoon I went to [the lab] to do more experiments …. so I never stopped my experiments but I tried to spend some time, some hours, with my family and it was very good to reduce my stress.

RECOMMENDATION 5
BALANCE YOUR NEEDS WITH YOUR FAMILY'S

Aaron Ciechanover – Nobel Prize 2004 for discovering ubiquitin-mediated protein degradation:
I am still married happily to a …. very career-oriented woman. …. She is a physician, a senior physician,

a department chairman …. I had to wait for her until she finished residency and only then we went to the post-doc and during the post-doc I had to make sure, not I – both of us, that she will also have a job in the same city. So we picked up the city according to availability for her. She studied at Harvard School of Public Health – so it's about accommodation and about admitting and talking and discussing and solving it.

RECOMMENDATION 6
PLAN YOUR WEEK CAREFULLY, BOTH PROFESSIONALLY AND PERSONALLY

Oliver Smithies:
Set time for your family and work it. One of the secrets I think of making it work well is if you have a family and want to go home at a certain time to look after or spend time with your children – plan your week carefully. End at the end of the day at the correct time. Let's say it's three o'clock because I have to pick the children up from the nursery, if it's my turn. So end at three or end at five, whatever time, go home and help with the family. But do one other thing: Come to work a little bit at the weekend hours because if you work only five days a week and you rest on Saturday and Sunday, Friday you are shutting down, Monday you are starting up, so Tuesday, Wednesday, Thursday you are really working only three days and two half-days. So, you are really not working a full week. But if you can arrange it so that on Saturday you come in, maybe a couple of hours, or maybe three hours on Sunday, you can keep your experiments going so that you don't get that interruption and you can get a lot more productivity by being careful with your time.

RECOMMENDATION 7
USE SUPPORT FROM YOUR PERSONAL LIFE

Peter Agre – Nobel Prize 2003 for discovery of proteins that channel water across cell membranes:
…. part of being successful in life, science or any other walk of life, is to be happy in your personal life. If you have a life partner, a wife, a husband, this can be an enormous asset. It certainly has been for me. One sort of general characteristic I have to say knowing now a few Nobel Prize winners and most of them are sort of middle- and late-middle aged men, is that their wives are wonderful people, thoughtful, warm-hearted, convincing, supportive. So I think a life partnership can help you in whatever endeavor you are doing, science included. In the end, that's the support team that brings you across the finish line. …. The support of a family, our friends, on particular our family, are irreplaceable in terms of having the confidence to go forward.
Barry Marshall – Nobel Prize 2005 for discovery of Helicobacter pylori and its role in gastritis and peptic ulcer disease:
You need your family life and your research life because, obviously, your research is not successful every day. Some weeks you would have some bad results, things are not going well, you might be criticized by somebody or have a rejection – in those days you do need to be able to go home and rest up, think about something else, talk to your wife. So I was lucky to have a supportive wife and good family life. By the time I was doing this research, actually I had four children, so I had a very busy life on the weekends away from the research.

RECOMMENDATION 8
SLEEP WELL AND HAVE HOBBIES

Oliver Smithies:
Sleep well at night. I'm really quite serious about that. … In the night, lots of things happen in your brain, putting things into different combinations. New ideas that you aren't even thinking about begin to happen in your brain. If you don't sleep well you don't give your brain time to do it. So sleeping well … is a very important part of staying healthy.
I think any hobby that a person does helps your career. It helps your scientific career, because it makes you relax. It's better that it be something not related to science – then you have a rest.

RECOMMENDATION 9
GET ADVICE FROM PEOPLE – YOU DON'T HAVE TO DO EVERYTHING AT ONCE

Elizabeth Blackburn – Nobel Prize 2009 for discovery of how chromosomes are protected by telomeres and the enzyme telomerase:
[To achieve a good work-life balance] get advice from people and you find it is more possible than you thought. And don't be daunted by the fact that it looks like you have to be doing everything at once, all superbly and all at once. That just doesn't really work. You have to be concentrating sometimes on the science and if you are interested in having a balanced life with the family, sometimes you have to have family concentration. But you keep persisting and don't be too discouraged by the fact that sometimes you are working really hard. …. It's not so terrible because it doesn't go on forever. It sort of happens in different waves.

RECOMMENDATION 10
IT IS POSSIBLE TO BE A GOOD SCIENTIST PART-TIME

Roger Kornberg – Nobel Prize 2006 for studies of the molecular basis of eukaryotic transcription:
You can be a good scientist half-time – but you can be a better one full time. …. We all know the very famous examples: Einstein who was a patent clerk and in his spare time he …. published five papers in 1905, founding quantum theory, founding modern physics with relativity,

…. there was the diffusion paper on Brownian motion where he first established the reality of molecules and you know we could go on, …. absolutely amazing.

DISCUSSION

Taken together, Recommendation 1 may play a key role towards trying to strike a work-life balance. At least for Nobel Laureates it can be expected that their work = their hobby. For them and for hopefully many other non-Nobel Laureates it is this love of, and devotion to, specific work which can make a good work-life balance for them, their families, and friends challenging. In extreme instances this may create a tension, though: Indeed, if work = play, spending time with family or friends might just be less fun. If it's not so much „I need to work, sorry" as „I'd rather work, thanks", we are looking at an extra challenge.

Per se, though, no one recommendation alone is sufficient or necessary for a good work-life balance and each scientist will follow his/her own mix of recommendations for arranging work and life. Indeed, a good work-life balance can differ, and may change, for everybody depending on personal circumstances, work tasks (i.e. whether they be drudge – Recommendation 3 – or play – Recommendation 1), and career stages. As noted in Recommendation 9, "It sort of happens in waves". That we distil 10 different (albeit not mutually exclusive) recommendations based on statements from 10 Laureates who will have undoubtedly encountered different situations in their careers implies as much.

Arguably the most important insight emanating from the Laureates is to be(come) aware *that* a balance between work and life is a recipe for success, health, and happiness. Thus, while included nobel laureates' statements (may) refer to times which (may) have changed, the value of striving for a good work-life balance remains unchanged. To exemplify: To possibly infer from family-related recommendations that a good partner and a bit of time with our children shall do the trick to be successful in science would be reductionist. To avoid this misinterpretation, please see – for instance – our discussion of Recommendation 10 below.

Moreover, it is worth noting that most of the recommendations are derived from statements made by male Nobel laureates. By 2019 (Lewis & Erren 2019), only 51 Nobel Prizes have begen awarded to women but 776 to men and disparities between the sexes are widespread in science, including academic medicine (Erren *et al.* 2014). Importantly, we need to acknowledge that striking a good work-life balance for female scientists was and still is – in numerous instances – more difficult than for their male colleagues. Although gender inequality in research has the tendency to decrease over time, male scientists are still more likely to reach and stay in the upper spheres of scientific excellence, which is partly due to uneven distribution of household and care work for children.

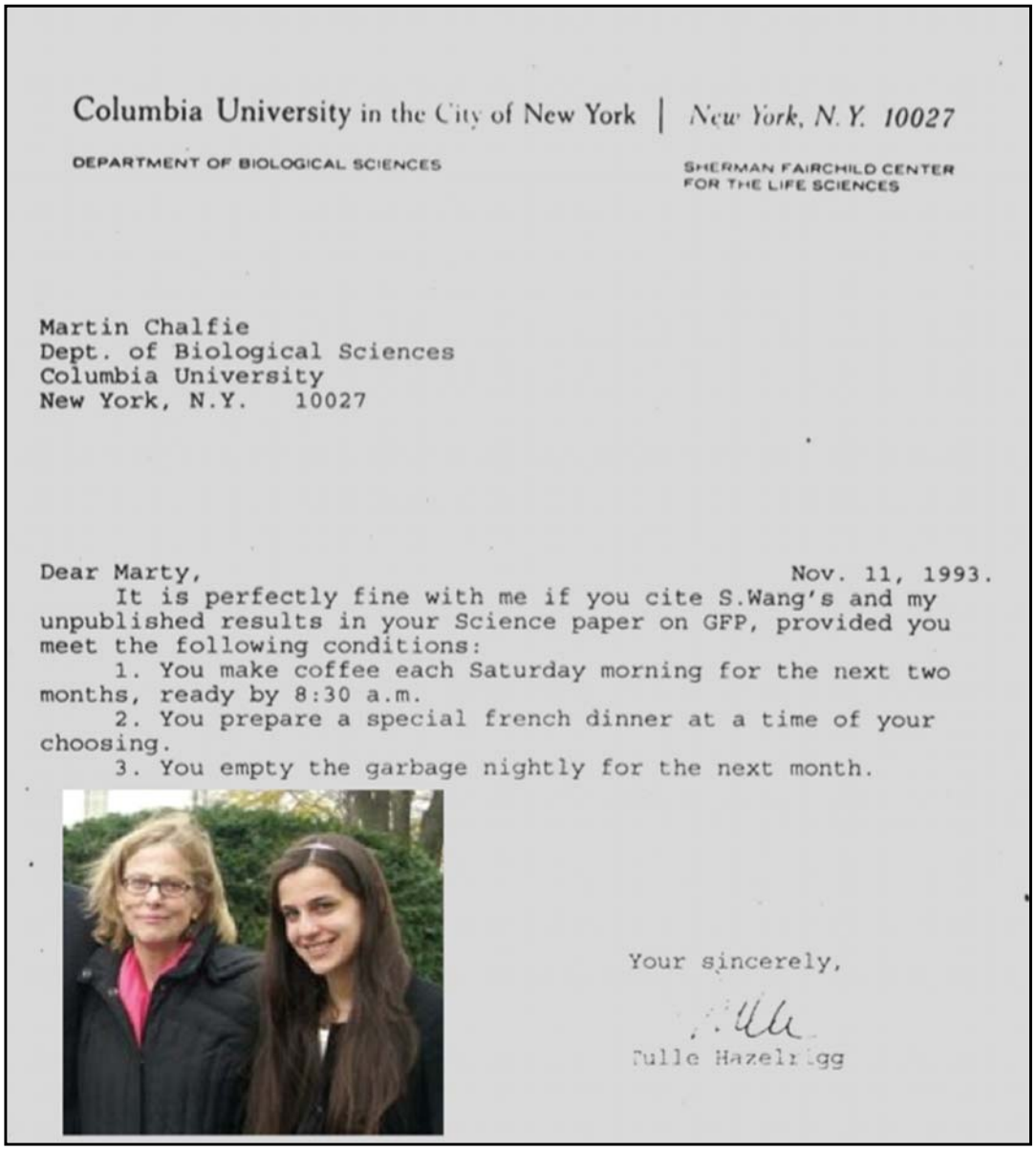
Each recommendation towards a good work-life balance relates to others. For instance, complementing Recommendation 2's emphasis on not working long hours all the time, Recommendation 9 states "sometimes you have to have family concentration". Clearly, the availability of scientists during holidays, weekends, or weekday evenings must have limits (Anonymous 2019; Roer 2018). To bring that imperative home: A tweet that went viral concerning out-of-office emails yielded "There is no such thing as an academic emergency" (Cherak 2020).

Looking at Recommendation 10, Kornberg provides no direct argument as to why it's better for scientists to work full-time. Instead, he refers to "very famous examples" as the exception rather than the expectation that you can do "amazing" work in your spare time. Interestingly, Kornberg's specific example – Albert Einstein – was married, father of two kids, and had a permanent position at the Swiss Patent Office. While examining patents may have contributed to Einstein's thought experiments, significant parts of his groundbreaking publications had to be confined to "spare time". Insofar, his *annus mirabilis* of 1905 likely benefited from both his unique mind and facets of a good work-life balance. In this vein, part-time scientists will do better work if their work-life balance is good. Note that part-time work can make it easier to follow the recommendations above, which can in turn foster positive work outcomes. Part-time work can lead to great achievements.

Recommendations 4 to 7 may need elaboration insofar as friends/siblings/parents can be just as good a support network as your immediate partner and kids. Even pets can be included as important contributors to work-life balance and, indeed, to both sides of this scale as evinced by Andre Geim. Awarded the Nobel Prize in Physics 2010 for co-discovering graphene, he is the only Laureate who also received the Ig-Nobel prize in 2000 for making frogs fly (Berry & Geim 1997; Ig Nobel Prize Winners 2000). Andre Geim acknowledged H.A.M.S ter Tisha (Geim & ter Tisha 2001) who participated in levitation experiments directly (Erren *et al.* 2017). It is important to appreciate, though, that families can also add to stress as exemplified during the current SARS-CoV-2/COVID-19 pandemic.

Overall, there is no doubt *that* striking an appropriate work-life balance is key. *How* to achieve a good and sustainable equilibrium may benefit from the luminaries' insights distilled into 10 simple recommendations here. In line with this, Blackburn suggested in Recommendation 9, "get advice from people and you find it is more possible than you thought".

To exemplify that the path to the Nobel Prize may come at a 'work-life price', the 'work-life agreement' to which Martin Chalfie referred in his Nobel Lecture (Chalfie, 2009) is shown in Fig. 1. Chalfie stated, "I had difficulty with one of the people who had already used GFP [Green Fluorescent Protein] and whose



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Martin Chalfie
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Dear Marty, Nov. 11, 1993.

It is perfectly fine with me if you cite S.Wang's and my unpublished results in your Science paper on GFP, provided you meet the following conditions:

1. You make coffee each Saturday morning for the next two months, ready by 8:30 a.m.
2. You prepare a special french dinner at a time of your choosing.
3. You empty the garbage nightly for the next month.

Your sincerely,

Tulle Hazelrigg

Fig. 1. The 'work-life agreement' Martin Chalfie referred to in his Nobel Lecture, signed by his wife Tulle Hazelrigg. The agreement concerns making coffee, cooking dinner, and emptying the bins at home. Originally published by Nobel Media and in PNAS (Chalfie, 2009) and reproduced here with permission: ©The Nobel Foundation 2008. Photo credit: Robert Tsien.

unpublished data I had wanted to cite. Most people were happy to have their results discussed, but this person put special conditions on our use of her data (Figure 9). The fact that she was my wife may have had something to do with the added requirements" (Chalfie 2008).

To conclude, at times, scientists will find an appropriate balance between work and life difficult to achieve, especially where societal norms contribute to unequal work requirements from, and career opportunities for, men and women. Such external factors should be addressed so that everyone can, in line with Marshall (Nobel Prize Inspiration Initiative: Insights from Nobel Laureates, for scientists everywhere), strive for such equilibrium in the long term: "You will need support from your family from time to time so it's nice to have that extra part of your life. Otherwise, you do loose balance. And, maybe, if you don't have any downtime … then your efforts in clinical medicine and your medical and science careers may be not sustainable. Maybe you are putting in 110% effort but you cannot do that your whole life – eventually you burn out. You don't want that to happen" (Mathews 2019).

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