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OPINION

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Seizing balance and success during your PhD experience

Rui S. Rodrigues[1,2]

[1]Instituto de Farmacologia e Neurociências, Faculdade de Medicina, Universidade de Lisboa, Lisbon, Portugal

[2]Instituto de Medicina Molecular João Lobo Antunes, Faculdade de Medicina, Universidade de Lisboa, Lisbon, Portugal

Correspondence
Rui S. Rodrigues, Instituto de Medicina Molecular|João Lobo Antunes, Faculdade de Medicina da Universidade de Lisboa, Av. Prof Egas Moniz, 1649-028 Lisbon, Portugal.
Email: rmsrodrigues@medicina.ulisboa.pt

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Abstract

Doing a PhD is a long, yet rewarding, expedition. Amid that journey, several decisions must be made to position yourself and stand out within a tough system as well as to align your personal goals and interests with those of supervisors, teams, and institutions. Many challenges will arise throughout that PhD journey and a degree of uneasiness and uncertainty will sometimes linger. In this opinion article, I put forth a personal and honest view of how to seize balance and success during your PhD experience. I reflect on issues such as failure, planning, work-life balance, and personal drive. All in all, I highlight difficulties shared among all PhD students while discussing personalized strategies and coping mechanisms to deal with adversity. Taken together, this is a timely piece that aims to raise awareness about the problems affecting most PhD students and, in parallel, to inspire and empower fellow PhD students. Notably, this is also a call to the research community to be sensitive to these struggles and to foster practices that enable PhD students to live to their full potential.

KEYWORDS
balance, PhD, success

1 | INTRODUCTION

As a young scientist, gradually becoming more mature, I have been realizing that too many of us today are forced to reckon with constant obstacles that hinder our path for success. In this time, I have met very few fellow PhD students who have not remotely considered neglecting a scientific career, especially in Academia. Too many are asked to prioritize work, to meet insane deadlines, or to follow crazy schedules. Several are compelled to be versatile at all times: better writers, better thinkers, better communicators, and better doers. Many of us are forced to juggle between endless hours in the lab and to generate new solutions to emerging, difficult scientific problems while coping with constant peer pressure, keeping track of novel research, and navigating through the process of finding what type of scientist we want to be. We are frequently invited to explore our creative and inventive minds and to keep a healthy work–personal life balance whilst striving to achieve a pristine scientific record. We see ourselves having to make tough decisions between work, family, and leisure time, often startled by the indirect consequences of such choices. We are regularly at dangerous emotional crossroads, carried away by our curiosity, driven by our ambition, or consumed by our passion for new knowledge (Pyhältö et al., 2012). Too many times too much is asked at such an early stage of our careers, and this is more than what we should ask ourselves to bear. All in all, the current scientific system incites a culture of long hours of labour coupled with extremely (internal and external) high competitiveness. Most of the times, this goes hand in hand with evaluation

criteria based on camouflaged meritocracy, obsolete ranking systems, and minimal career prospects. It is a harsh system that drains both physically and emotionally at a continuous, exponential pace. I believe the scientific society is not doing enough to make change and, in turn, that causes many of us to succumb to it.

Despite this pessimistic narrative, my PhD journey is perhaps an exception(al) one. I am now in the fourth year of my PhD course in Lisbon, Portugal, and I have been having the greatest time of my scientific career so far. Unlike most of my peers, I was extremely fortunate to be welcomed into a research group that focuses on developing the experimental and soft skills of its students. On top of that, I have an extraordinary mentor that gives me precious guidance and career advice, which I consider essential at this early stage of my career. Therefore, based on my personal, and rather short and privileged, experience I wanted to share five major tips and resolutions (Figure 1) that I find crucial to travel this long yet very rewarding PhD road.

2 | DEVELOP RESILIENCY

First and most important advice: you will face a lot of failure and frustration and you will need to weather through it. One of the main challenges during your PhD will be to adapt to the idea that most of the experiments you design and conduct will not work or that some of the hypotheses you formulate will end up failing.

Managing your expectations and those of others is a key aspect when dealing with this adversity. Doing a PhD may be mentally taxing because most things will not always work the way you envisioned. To cope with that frustration, keep your expectations low and always have a plan B.

I am the nonplanning type and if I were to give any word of advice to my past self (and even to my present self), it would be to plan, plan, plan! Categorize tasks and duties according to their urgency and importance because that will help with planning and taking decisions. For instance, make an SWOT analysis to help you identify *strengths, weaknesses, opportunities, and threats* during project planning. You can also use the STAR approach, a technique often used to describe a specific *situation, task, action, and result* of the situation in interviews, to assess how you handled a specific work situation and learn how to manage future scenarios/challenges. These are powerful tools that might be valuable throughout your entire professional life. Take into consideration not only short-term goals but also have a big picture of what you wish to accomplish and conquer. For instance, if you aim for a high-impact publication, which may be key in defining your success in Academia later on (Couch, 2020), be sure to communicate that to your adviser early on and plan accordingly.

Encountering failure on a regular basis creates resilience and that can be quite a tough skill to learn. In fact, I dare to say that this resilience is somewhat necessary to keep on moving. Supporting this, growing evidence have showed the importance of developing resilience during graduate training, suggesting that resilience is built under a combination of aspects rather than individual coping mechanisms *per se* (Cantwell et al., 2015; Devos

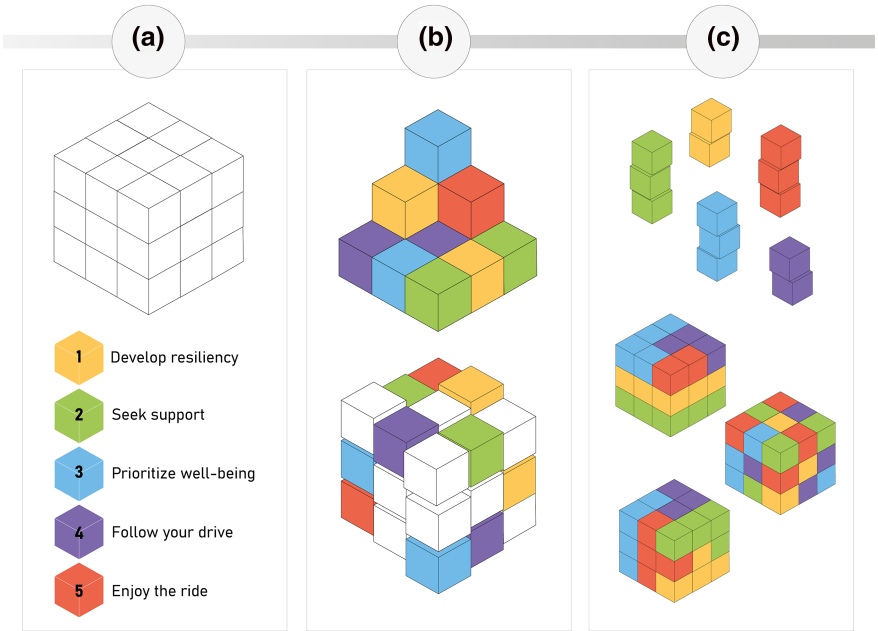

FIGURE 1 The PhD process. (a) Initiation phase is composed of a cube ready to be filled with building blocks consisting of (1) develop resiliency; (2) seek support; (3) prioritize well-being; (4) follow your drive; (5) enjoy the ride. (b) Assembly phase entails the construction of your PhD cube. The method you use and the rhythm at which you build your cube relies entirely on your personal and project needs. Small adjustments along the way are expected. (c) Completion phase represents the end of your PhD or the way you envision it to be. The amount of each one of the building blocks and the way they are organized will be dependent on your overall experience. Different PhD students will undoubtfully have different cubes, that is, different experiences

et al., 2016; Mowbray & Halse, 2010). Of highlight, a recent study proposes a model of resilience protection necessary for PhD completion (McCray & Joseph-Richard, 2020) by identifying several factors that might influence one's ability to build resilience during doctoral performance. The authors postulate that PhD students' success depends on the interrelationship between personal responses, environmental and social connections, and institutional processes. All these entail personal managing and stress-coping skills, family and community support, supervisory relationship, and faculty/university assistance.

That resilience will be fundamental to keep you afloat, paddling through your scientific (and personal) life. Rejections and failures will certainly outweigh achievements throughout your PhD. As I think back on past negative experiences, I guess one of the most impactful ones was my first ever manuscript submission. On the first round, the paper got rejected by the editor right off the bat. I was gutted. Then, when we went for a second submission, one of the reviewers raised a lot of questions that would require a huge number of extra experiments to answer. It was terrible because I did not think I was going to publish it in due time. But it was when I learned how to deal with rejection, constructive criticism, and tight deadlines.

Being able to learn from those struggles, or even mistakes and bad decisions, and persist is an extremely valuable ability. Develop personalized strategies to overcome your challenges and rely on those to counteract failure. There is a famous quote in Samuel Beckett's *Worstward Ho!* that, albeit completely taken far from its gloomy original context, has a really inspirational tone when tackling failure, especially in Science: "Ever tried. Ever failed. No matter. Try again. Fail again. Fail better." My adapted motto: fail, adapt, overcome.

3 | SEEK SUPPORT

Finding the right mentor can be troublesome. My advice is to look for someone that suits your "working personality" and fosters empathy in a professional way. Engage in finding a compatible supervisor that is both understanding and demanding at the same time. The more you commit on getting to know your supervisor's vision and letting that person know about your working habits and ideas, the more fruitful that relationship will be. Communication is key. You will eventually have your own working idiosyncrasies but establishing your own communication method and working to understand what better suits both in terms of approach and regularity is a must. Dialogue and progress updates are essential to strengthen that connection. Do not leave anything to say during your discussions, do not leave room for misinterpretations, and take notes of everything. After reaching a lot of compromises, you will eventually become "partners in crime" where mutual trust rules and scientific ideals converge in a quest to discover new knowledge.

Interestingly, recent evidence shows that research mentors are likely to take on multiple, often conflicting, roles as research advisors, educators, and supervisors (Clement et al., 2020) when enrolling into supervisory positions. This means that they may advise, educate, and supervise distinct trainees at different points, which inevitably translates into a different impact on their experiences. Better understanding and disentanglement of these three separate roles is needed to align research mentors' interests to PhD students' research goals.

Despite the huge role supervisors may play, be aware that you will always be the driving force behind your PhD. Many times you will have to come up with solutions on your own or spend hours ruminating on a way to fix a problem by yourself. You better be prepared to break through difficult intellectual and technical issues mostly in single-player mode. As a PhD student, you cannot bury your head in the sand and hope a given problem fixes itself. You will have to roll up your sleeves and get it to work. Your supervisors will only be there to help you define a clear plan (or sometimes complicate it) and guide you with helpful information and resources.

I realized that right after I started my PhD when I first met my co-supervisor in person. I can vividly remember that day. In the middle of a conversation at dinner with both my supervisors, where we were discussing future plans and experiments, he bluntly told me: "You are the captain of this ship. We (mentors) are only here to advise you during this journey." I was instantly struck by those words, and they have been stuck with me ever since. From that moment on I realized that I would need to be the commander of my PhD, no matter how much support they could give.

Advice from peers is also extremely important. Colleagues can often relate to most of your issues, like when you are missing a reagent in the lab or when you are getting "micromanaging vibes" from your supervisor. Because they have endured through similar situations, they will be able to give vital advice during troubled times. Online communities such as PhD Balance (https://www.phdbalance.com/) are also available to help you learn from shared experiences, with great resources related with career development and overall wellness. Finally, rely on family and friends for support. Even though most of them will not fully empathize with most of your problems, I am sure they will be there for a word of advice or to comfort you during difficult situations.

4 | PRIORITIZE A HEALTHY WORK-LIFE BALANCE

Taking care of your well-being should be a top priority. Recent findings from a Nature survey to more than 6000 doctoral students raised awareness on mental-health issues, revealing a staggering one quarter of respondents who listed mental health as an area of concern (Woolston, 2019). This goes in line with evidence showing that the prevalence of mental health problems is higher in PhD students when compared with that of highly educated general population, with one in three at risk of developing a common psychiatric disorder (Levecque et al., 2017).

Hard work is ahead of you and the amount of stamina you will require to keep the PhD engine running will be enormous. From my own experience, juggling between work and personal life will be the number one variable you will need to control if you want to reach optimal performance. But know in advance that there is no perfect formula to achieve that balance. Self-awareness is critical. See your PhD as a "normal" job. The amount of extra hours you want to put into it is up to you. For some, a 24/7 work routine is fine, while for others, a 9 to 5 daily schedule may be more than enough. Getting serious work done demands intense mental focus, which your brain can only cope for a few hours a day. Scientific evidence increasingly supports our brain's need for mental downtime to replenish our internal stores of attention and motivation. In turn, only a few bouts of focus and creativity happen during the day (Schrager & Sadowski, 2016). Invest in seizing those little bursts of energy to be the most productive by minimizing distractions and conscientiously performing single rather than multiple tasks at once. By grouping and deferring interruptions based on how long they can afford to wait, an approach used by modern computers known as interrupt coalescing, you will be able to produce more in less time.

Time management strategies can also help you improve focus and simplify your work. For instance, the *Pomodoro technique* might be effective in this regard (Cirillo, 2018). Basically, break down your work into specific blocks of time (traditionally 25 min) and take short breaks (traditionally 5–10 min) in between. After reaching three *pomodoros* (intervals of time spent working), take longer breaks if needed. Adapt this or make small variations considering your workload for the day or week.

Interestingly, if you take into consideration Pareto principle, or the 80/20 rule, you will realize that 80% of your work will be done in 20% of your time or that, most likely, 80% of your results will come from 20% of your experiments. This means that you will have to monitor periods of naturally high productivity and discover where your 20% lies to achieve peak performance. Ultimately, you will have to define your own limits and find your equilibrium, what works best for you. The trick is to avoid comparing yourself with others and coming to terms with that own-defined recipe (Nolte, 2020). Do not try to be like someone else, just focus on being excellent in your own lane.

View your PhD as a marathon, not as a sprint race. Several times you will feel overwhelmed by the number of tasks at hands, a challenging technical endeavour, or a demanding writing period. That is completely normal given the fast pace at which the world spins nowadays. Transform those moments into steppingstones and take advantage of them to better know how to handle stressful times. Giving yourself little breaks in between experiments to socialize or to entertain yourself with some distraction will help you relieve some tension. If you feel any signs of distress or burnout, seek out help with colleagues and mentors, or even professional help.

Another aspect you may consider is to normalize "saying no" without feeling guilty, whether one of your colleagues asks for your help when you are running late for an appointment or your boss asks you to optimize a specific experiment when your plate is already full. Those moments will bring uneasiness, but you will have to get around them and respectfully say no without letting remorse get you. "Saying yes" is also extremely important. Working with a new collaborator whose *modus operandi* is totally different from yours or helping out a lab mate that is on a tight deadline will be needed at some point. Sometimes you will have to be altruistic and abdicate some of your time to keep the ship sailing.

Find time for yourself and for your hobbies. Something besides work that helps you relax and makes you substantially happy. Hang out with friends, exercise, volunteer at local initiatives, learn a new language, play a new instrument, meditate, and so forth. Make sure to take holiday time. If you are struggling with lack of motivation or self-doubt look for extra support, pause for a moment and take a long break if you need it.

Avoid getting hooked in insane routines and do not give yourself in to crazy schedules, unless absolutely necessary. Bear in mind that a long-hours culture, often encouraged in Science, where people work from dawn till dusk, weekends and holidays, has been shown to be detrimental to health status (Kivimäki et al., 2015; Wong et al., 2019). You will certainly have to make sacrifices but be sure to prioritize your mental and physical well-being and overall quality of life.

5 | FOLLOW YOUR DRIVE

Doing a PhD can be overwhelming... So many expectations and the feeling of too little time for too many responsibilities and deadlines. Understand that, as in life, there will be upsides which inevitably come with downsides. Realize that in Science you usually make one step forward and two steps back. There is no sugar-coating it. It will be a rollercoaster: either extremely cheerful—perhaps when you publish your first paper—or incredibly discouraging—when that one experiment you have put your heart into fails miserably.

Consider making an outline of your research and career objectives—adjusted to personal goals—and identify realistic and reachable milestones within a specific timeline: 1, 5, or even 10 years. Maybe discuss it with your mentor and colleagues. Then keep on revising that same plan on a regular basis to help you figure out your immediate, short- and long-term goals. Depending on your personality, either the "go with the flow" or the "major planner" type, a more regular or less frequent revisiting of that plan may be needed. In fact, to help you set goals and plan your career, great free and easily-accessible tools such as myIDP (Individual Development Plan) (https://myidp.sciencecareers.org/) or ImaginePhD (https://www.imaginephd.com/) are available. Further, most institutions and universities now have Training Advising or Career Development offices that have a lot of resources and services to help you learn about your skills and interests, explore career options and strategies to attain your desired career outcomes.

Perhaps you see yourself in the future as a successful investigator and/or professor in Academia. For that, you might want to invest some of your time on extracurricular courses such as scientific writing or lab leadership workshops. Participation in international conferences or public engagement initiatives may also be beneficial to develop your communication skills and boost your curriculum.

If you picture yourself in a role outside Academia, there is also an array of options that may suit your career goals. As we are heading towards transparency regarding PhD programmes and outcomes (Blank et al., 2017), more and more nonacademic opportunities in biomedical and biotechnological companies are emerging for PhD holders: project manager, business developer, scientific consultant, and so forth. Working on your skill toolbox and practising for interviews may be relevant in this regard.

Societal engagement can be one of your passions and you may decide to design and plan outreach activities to raise public awareness on the benefits of (your) research.

It may also be that you are considering quitting because you are slowly realizing that your PhD is not what you thought it would be or that it is giving you more headaches than enjoyment, and that is perfectly reasonable. Detach yourself from personal and societal pressure and follow what gives you meaning and purpose. New evidence suggests that chasing purpose could potentially give you more resilience than passion alone, and that that determination is what is likely to make you most successful throughout life (Jachimowicz et al., 2018). Be confident on your path choices and understand that there is always the possibility of redirecting your career at any point. You have the power to decide what kind of road you want to walk.

6 | ENJOY THE RIDE

Navigating through your PhD may be extremely daunting but remember that you are not the first, nor will you be the last, to embark on this journey.

Your PhD will be an excellent opportunity for personal and professional growth. It will be a time when you will be able to further develop your critical thinking, planning skills, and technical abilities. You can count on moments of complete fatigue or utter joy, moments of desperation or pure realization. Oscillations between procrastination and peak productivity will definitely occur. But understand that you are at the forefront of uncovering new knowledge, bridging the gap between what is known and what is undiscovered. And it is the journey to that frontier that should matter.

Sailing through uncharted waters is part of the process. It is important to remember that figuring out what does not work/did not work is equally as important as finding what does/what did. It is all progress. Do not only look at past successes but also learn to appreciate failures. The sum of all of these will define your PhD baggage and ultimately be crucial for future endeavours, whatever they may be. Take time to appreciate each moment of your PhD, be it that amazing conference you are planning to go to share your results and practice some networking (that will make you absolutely thrilled) or that proof-of-concept experiment that end up not working (and, of course, made you sad). Soak it all in and learn from all of it. Make sure to take notes about everything—those will be very important later on when you update your CV or plan your career.

At the risk of sounding overly positive, do your best and be conscious about your goals. Fight for questions that make your heart pound and do not let pressure overwhelm you. Be tenacious, and take risks. Acknowledge your talent and recognize that you are worth and capable

of accomplishing your ambitions. Do not let impostor syndrome hit on you. That misguided perception of self-doubt, that never-ending search for perfection and excellence allied to a fear of judgement by others that keeps lurking within takes a great toll on us all. To overcome that internal voice, practice shutting down damaging behaviours that may be sabotaging your full potential (Dickerson, 2019). As stated by a fellow PhD student in a recent opinion article, you can implement three strategies to beat that impostor feeling: (1) use that inner critic to your own advantage by identifying areas where improvement is required, (2) visualize success and solutions for future hypothetical challenges, and (3) let go of perfectionism (Keogh, 2020).

Remember this: be pragmatic. Cut through the noise and triage your immediate problems. Try to find strategies and solutions for them with mentors and peers alike. Gain resilience. Pursue what keeps you inspired and appreciate the ride as much as you possibly can. Keep in mind that this only an episode, not the full chapter. You will face lots of challenges but know that, in the end of your PhD, it will all be worth it. Doing a PhD is a transformative experience, it will definitely make you a better version of yourself so be sure to enjoy the journey while doing so.

7 | CLOSING REMARKS AND OUTLOOK

At every stage of your career, you will most certainly relate to the problems and solutions presented in this article. As depicted in Figure 1, I believe the PhD process is composed of three main interconnected steps. **Stage A**—initiation phase: imagine your PhD as a cube composed of individual building blocks ready to be filled. Picture it as a white canvas ready to be painted. The colours available in the palette are the five major points discussed along this article: (1) develop resiliency; (2) seek support; (3) prioritize well-being; (4) follow your drive; (5) enjoy the ride. **Stage B**—assembly phase: as your PhD advances, you will start building the cube, filling the empty spaces of that canvas. The way you do it is entirely up to you. You can either decide to go for a brick-by-brick approach first, slowly building the cube, or envision the final cube and start filling it with some of the units. What I mean by this is that, throughout your PhD, you will have the need to adjust the quantities of each building block as well as the arrangement of each element into the cube according to your personal and project needs. **Stage C**—completion phase: as you are finishing your PhD, you will realize that your experience is/was unique; that is, the amount of each unit required to fill the cube is/was tailored to your own track record. When you compare your experience with that of fellow PhD students, you will also realize that different cubes may require different numbers of each one of the building blocks and that these may be organized into different formats. The layering and disposition of each cube will depend on and is closely related to the experience each PhD student has/had during their doctoral training.

To add onto the aspects discussed above, I offer you some last pieces of advice: identify the current gaps in your formation, expand your competencies, think "outside the box," be mindful about the "big picture," and explore new opportunities. Know that only you can find the right path to successfully carry out your PhD. Build a narrative you feel comfortable with. The building blocks to steer your PhD in the right direction are at your disposal. You just need to reach for them.

Finally, and as we are experiencing a social reckoning in the scientific culture, it is no longer acceptable for institutions and society to stay out of the conversation. Action is needed from the research community, and society at large, to help PhD students seize success and balance during their PhD journeys. You keep on demanding out of this young generation of scientists—which I am part of—to produce more, to perform faster, the sooner the better, to keep on striving for greater scientific curricula. You keep on applauding overworking and glamorizing scientifically governed, often toxic, lifestyles. You keep on raising the standards, pushing the bar higher and higher and indirectly undermining the future of hundreds of young scientists, letting chance define our professional careers. And you do so without providing a safety net, without giving any prospective guarantees.

Indeed, one must reflect not only how change must happen but what has been done to build the scientific system this way. What burdens are being placed at such a young stage? What opportunities are being kept from early-career scientists? In which way are our paths being compromised? What tools can be supplied? These are all questions to consider when developing strategies, on one side, to protect the next generation of researchers and, on the other hand, to find better ways to measure success in research.

Overall, more attention should be drawn to PhD students and their experiences. The research community should be invested in solving problems that arise during early career stages. These difficulties entail limited support, lack of focus or direction, poor time management, disruptions in work–life stability, and fear of failure and taking risks. In fact, these are problems deeply rooted in the way Science currently operates and a clearer understanding about the needs of PhD students allied to better

early stage-oriented research policies may help to pave the way for change. Focus must be centred in developing general good practices in research culture that promote adequate work–life balance and foster the attainment of reasonable milestones during doctoral education. Solutions may lie in providing more training for supervisors and trainees, raising awareness across all research-related entities—from institutions to funding agencies—and in defining new processes to rate and measure scholastic performance. As one 2019 study has put it: "Ensuring that all supporters – not just group leaders – receive help, training and recognition may be key to fostering healthy, positive relationships between those who provide and receive support" (Loissel, 2020). In fact, training research scientists to become better mentors has been shown to improve the quality of undergraduate research experience and enhance the quality of undergraduate research (Pfund et al., 2006), which reinforces the need to infuse the scientific system with this kind of practice. Further, as emphasized by a recent report from the Organisation for Economic Co-operation and Development (OECD), nations, universities, and research institutions worldwide must redouble efforts to expand training for junior researchers and closely track career outcomes for early-career scientists to improve understanding of local and international challenges and opportunities (OECD, 2021).

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CONFLICT OF INTEREST

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ORCID

Rui S. Rodrigues https://orcid.org/0000-0002-9343-745X

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