

Lessons learnt from outstanding mid-career women in endocrine cancer research

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As cancer researchers, scientific data are by far the predominant language with which we tell our stories. We tell these stories in scientific publications, our conference presentations, to our trainees and to agencies and philanthropists supporting us to conduct fundamental basic and translational research. These stories are the path to achieving the ultimate goal of improving the lives of cancer patients. But to borrow from the American author Stephen King, 'I think the best stories always end up being about the people.' This thematic series highlighting mid-career women in endocrine cancer research presents some of these stories to acknowledge success, learn about new research fields and gain glimpses into the challenges, decision-making processes and roads travelled by these women on their path to achieving their professional goals.

To establish this series, endorsing societies of *Endocrine-Related Cancer* were contacted and the journal undertook a dedicated marketing campaign seeking nominations of outstanding mid-career women in endocrine cancer research. Nominees were assessed by a subset of editorial board members and the top six women from a competitive group were selected to be featured in this series, both through personal profiles and review articles of their current research areas. Review articles focus on a broad range of topics, including how molecular-based discoveries are beginning to drive new treatment strategies for neuroendocrine (NET) tumours (Pavel & Sers 2016); aspects of understanding prostate cancer, including the role of DNA methylation (Sweet & Ting 2016), the role of nuclear receptors (Leach *et al.* 2016) and circadian

rhythmicity in the development and progression of this malignancy (Kiss & Ghosh 2016); as well as the role of extracellular matrix proteins in ovarian cancer metastasis (Ricciardelli *et al.* 2016) and thyroid-stimulating hormone in thyroid cancer (Nieto & Boelaert 2016).

In recent years, numerous articles have focussed on why there is a global underrepresentation of half of the world's population, i.e. women, especially at senior levels, in academic medical research (Muhlenbruch & Jochimsen 2013, Shen 2013, Casadevall 2015, Ovseiko *et al.* 2016). Programs designed to address these issues, such as the Athena SWAN Charter in the UK (Donald *et al.* 2011) and the Asia-Pacific Economic Cooperation (APEC) and Women in STEM (Science, Technology, Engineering and Mathematics) study, are offering new guidelines with the goal of influencing these inequities. Younger researchers wishing to emulate the success spoken of in this series will no doubt be navigating a different landscape, dictated somewhat by the changing expectations driven by programs such as these. Still, much of the experience and wisdom of successful people are timeless, and although there is no single 'formula' to guarantee success as a medical researcher, a number of common threads have emerged from these stories. Some of these are discussed below.

Early curiosity of science

Scientists are frequently driven by keen powers of observation, a fascination of the natural world and the

need to understand and explain it. A number of women spoke of childhood fascination of nature – ‘How could understanding how things work not be the most fascinating thing?’ (Bevan 2016). Early interest in science was quite broad, with two women in this series beginning their training as physicists before ultimately working in biology (Bevan 2016, Ghosh 2016).

The importance of strong academic mentors

The influence and importance of mentors, both men and women, permeate the stories in this series and is perhaps the strongest theme running throughout – ‘I appreciated finding kind and strong support along my way’ (Pavel 2016). Academic mentors come in many different forms, from the most senior academics, leaders in their fields, who may recruit you and seek to nurture your potential, to those closer to your career stage. Mentors may be the ones who work with you at the bench, teaching you the techniques and strategies you need to learn to understand what is possible in medical research. They readily share their knowledge with you, perhaps suggesting areas of research that would benefit from your intellect and skills. Mentors may also provide the gentle nudge you need to apply for an opportunity such as a new position in another country or a large grant to fund your research. They have the power to shape all of our academic paths, including preparing us to step up and take on the mantle of mentor for early career researchers following in our own footsteps – ‘Through dedicated and committed guidance by my mentors, I have learned to appreciate the importance of training the next generation of researchers and clinicians’ (Boelaert 2016).

Determination to overcome difficulties

The comedically told story of trouble-shooting a difficult experiment in ‘Dude, where’s my band?’ underscores the patience and focussed determination required to navigate what, at times, can feel like a minefield in the laboratory (Ting 2016). In fact, the concept of tenacity and determination is a firm undercurrent in all of these stories, with many expressing a ‘strong determination to succeed and not give up when I found something difficult’ (Ricciardelli 2016).

The power of collaborations and networks

Extended collaborations and networks, whether you are the creator of these networks or a participant within them, can be career-defining. There are many examples of

collaborative initiatives in this series, with the importance of these networks for studying rare malignancies such as neuroendocrine tumours (NETs) made especially clear – ‘Due to the rarity of the disease, large randomised controlled trials could only be initiated in an international setting’ (Pavel 2016). Establishment of patient support groups is also discussed. Undoubtedly, the message is to participate in collaboration and networks; be the driver of these structures if they do not already exist, do this early and then whenever possible and appropriate in your career – ‘As any sensible scientist should, I continue to call on my valued colleagues for input, collaboration and help on a regular basis’ (Bevan 2016). Many spoke of the pleasure of establishing and/or working in teams of multidisciplinary clinically and scientifically trained researchers, this diversity of skills bringing strength to many research endeavours.

On family, partners and children

Women spoke warmly of the support from parents, both those who had come from academic families, and those who were the first in their families to enter into academia. The importance of parents, in many ways our first mentors, was recognised in fuelling an ‘inquisitive spirit’ and ‘thirst for knowledge and discovery’ (Boelaert 2016). It is not uncommon in academia to have an academic partner and stories include career decisions based on location, or relocation, of partners. With complete clarity and consistency, these potential forks in the road were viewed as opportunities for career advancement.

Career decisions made around children are discussed, from choosing to stop laboratory work temporarily during pregnancy, working part-time when children were young, and remaining geographically nearby to extended family during these early years for support. The overall message is that a successful career in medical research can be combined with raising a family if this is what you choose to do – ‘Balancing family life and work was always a juggle but also very rewarding’ (Ricciardelli 2016).

Parting advice to those following in the footsteps

Collectively, and with the benefit of hindsight built on years of experience, a number of clear messages emerge from the women in this series. Through all the swings and roundabouts that constitute a career in medical research, you will never stop learning. It is important to protect time

for critical thinking, something that is well recognised as 'vitally important to the scientific process' (Ting 2016). Learn how to do this now, and it will serve you for the rest of your career. It is equally important to maintain the early curiosity that first set you on your scientific path and to nurture it in others. Whether your drivers are intellectual curiosity, a desire to help patients, or a mix of these things, keep your focus and remain tenacious in achieving your goals. Wherever possible, choose to 'work on what really excites you with people you like and respect' (Bevan 2016).

There are many more pearls of wisdom in the individual profiles in this series. Finally, remember to share your own stories with your colleagues, both women and men, and especially those aiming to follow in your footsteps. 'In the future, there will be no female leaders. There will just be leaders.' – Cheryl Sandberg, COO, Facebook, 2015.

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