

A Stronger IMPACT on Career Development for Early- and Mid-career Faculty

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Abstract

Nuclear receptors are important in normal physiology and disease. Physicians and scientists who study nuclear receptors organize and attend conferences and symposia devoted to foundational and translational nuclear receptor research, but the field lacks a platform for early-stage investigators and aspiring leaders. In 2019, Zeynep Madak-Erdogan, Rebecca Riggins, and Matthew Sikora founded Nuclear Receptor (NR) Interdisciplinary Meeting for Progress And Collaboration Together (IMPACT, <https://nrimpact.com>), a collaborative group designed for early- and mid-career faculty who study nuclear receptors in any context or organism [1]. NR IMPACT addresses challenges for early- and mid-career faculty. Here, we review the progress of NR IMPACT and discuss how our peer-mentoring cohort is removing hurdles for new faculty and advancing nuclear receptor biology.

Key Words: mentoring, nuclear receptors, young investigators

Abbreviations: IMPACT, Interdisciplinary Meeting for Progress And Collaboration Together; NR, nuclear receptor; PI, principal investigator.

The Formation and Structure of Nuclear Receptor Interdisciplinary Meeting for Progress And Collaboration Together

The idea of developing a research peer group was conceived by Drs. Madak-Erdogan, Riggins, and Sikora in August 2017 at the Gordon Research Conference on Hormone-Dependent Cancers. The trio recognized that at most conferences, the talks and discussions are dominated by senior faculty, whereas early-career faculty are rarely afforded the opportunity to discuss cutting-edge ideas or to build visibility. Additionally, opportunities to discuss the challenges in establishing and maintaining a research laboratory were rare, leaving these new faculty to rely on “on-the-job training” to learn the soft skills needed as a Principal Investigator (PI).

In 2019, Nuclear Receptor (NR) Interdisciplinary Meeting for Progress And Collaboration Together (IMPACT) was formed to address the challenges facing early- to mid-career investigators in the NR field (<https://nrimpact.com>). Looking back on the past 5 years, we suspect that the challenges we faced are not specific to the NR field; thus, NR IMPACT could serve as a model for early-stage investigators in other scientific specialties.

First and foremost, NR IMPACT provides a safe and confidential space for our cohort to discuss nascent research projects in a supportive, collegial environment without fear of ideas or experiments being scooped. This safe space also allows us to discuss the nonscientific challenges—like the politics of tenure

and promotion, managing trainees and technicians, dealing with difficult colleagues—in a supportive and confidential environment. NR IMPACT primarily supports its faculty by fostering collaborations, offering guidance on grant and paper writing, navigating academia’s unwritten rules, and creating a supportive network.

NR IMPACT has 40 members. A total of 20 to 25 people regularly attend our biweekly Zoom and biennial in-person meetings, whereas the rest participate as their schedules allow. We aim to recruit 3 to 5 new members per year, open to any career stage but weighted toward assistant professors. Between new members and the aging out of more senior members, we envision that the engaged core group will hover around 25 people, even when the total the number of members increases beyond 40.

As members are promoted to full professor, they are expected to naturally transition to emeritus status. Emeritus members can advise, suggest, or participate in collaborations and join the biweekly NR IMPACT Zoom sessions, but are not expected to attend in-person biennial meetings. Because we are only 5 years old, no members have yet transitioned to emeritus status, which we expect will not occur for another 2 years. To preserve a space for open, confidential discussions, trainees and their current or former advisors cannot be members simultaneously. Consider a postdoc, from the laboratory of an NR IMPACT PI, who is promoted to assistant professor. If the newly promoted assistant professor joins NR IMPACT, their former PI will become an emeritus member.

Received: 9 August 2024. Editorial Decision: 15 October 2024. Corrected and Typeset: 19 November 2024

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NR IMPACT recruits members from North, South, and Central America, as well as the Caribbean. Although scientists in Europe have expressed interest in forming a global NR IMPACT, we currently lack the resources to support this. We are, however, happy to support European scientists in forming their own NR IMPACT, and those efforts are now under way. For recruitment, we identify junior PIs who give outstanding talks at The Endocrine Society's annual meeting and invite them to present at our biweekly Zoom sessions. The membership then discusses and reaches consensus on inviting new members, based on the quality of their talk and interactions with the group. To promote diversity and avoid bias, we consciously avoid word-of-mouth recruitment.

Next, we discuss our 4 driving principles.

Building Visibility and the Reputation That Drives Tenure

Establishing a national reputation is critical for earning tenure. One way to increase visibility is through presenting seminars at external institutions. Many NR IMPACT members run seminar series at their home institutions and are poised to fill in last-minute cancellations with other NR IMPACT members. Calls for speakers go out on the NR IMPACT Slack channel, with preference given for those members who are pretenure. Shifts to virtual seminars have expanded opportunities for pretenure members to present their research. To date, NR IMPACT members have arranged more than 20 presentations at member's home institutions. For example, 5 different members have presented in the University of Colorado Anschutz Medical Campus Pathology Seminar/Grand Rounds series (hosted by NR IMPACT cofounder Matthew Sikora). NR IMPACT members have also presented invited seminars at University of Illinois (hosted by Erik Nelson and Terry Moore), Georgetown (hosted by Rebecca Riggins), University of Colorado Anschutz Endocrinology Research Conference (hosted by Katja Kisseljok-Vassiliades), University of Kansas Medical Center (hosted by Christy Hagan), University of Minnesota (hosted by Julie Ostrander), Baylor College of Medicine (hosted by Daniel Gorelick), City of Hope (hosted by Lindsey Treviño), and Loyola University Chicago (hosted by Sean Fanning).

Another way to increase visibility is through presenting at national and international conferences. NR IMPACT members plan symposia for meetings hosted by scientific societies and invite other members to be panelists. For example, in 2021, Dan Frigo and Zeynep Madak-Erdogan cochaired a conference co-organized by FASEB and the International Committee on Rapid Responses to Steroid Hormones. They invited several NR IMPACT members to present or chair sessions. During the last 3 annual meetings of The Endocrine Society (2022-2024), more than a dozen NR IMPACT members gave invited talks or chaired sessions.

Finally, visibility can also be increased through publications. This is arguably the principal driver of tenure for biomedical researchers at R1 universities. Although most publications are driven by the PI and their laboratory, NR IMPACT has sparked collaborations that led to more than a dozen publications as primary data manuscripts, review articles, and conference proceedings and commentaries [2-17]. Publications not only support earning tenure, but also support future collaborative grant submissions from NR IMPACT members.

Procuring Feedback for Project Development and Grant Proposals

NR IMPACT members can leverage subject matter expertise within the group to receive feedback on projects and grant proposals. Focused brainstorming sessions with a panel of relevant subject matter experts is particularly beneficial for grant ideas in their early stages. Receiving this type of feedback in local departments is a challenge because the breadth of expertise in local departments is greater, and thus less focused and less likely to reflect the judgments of a National Institutes of Health study section. Platforms for this feedback include the biweekly Zoom meetings where NR IMPACT members present, as well as the NR IMPACT in-person meeting held every other year (see the following section for an extended discussion of IMPACT22). Although these feedback sessions are helpful for single PI grants, they have also resulted in collaborative grant submissions from NR IMPACT members. To date, NR IMPACT members submitted 9 collaborative grants, of which 5 were funded. These include an R01 from the National Cancer Institute (Matthew Sikora, Lindsey Treviño), a Team Science Award from the Department of Defense Cancer Research Program (Jason Gertz, Christy Hagan), and a Research Scholar Grant from the American Cancer Society (Terry Moore, Sean Fanning). These collaborations are between NR IMPACT members at different institutions, highlighting the benefit of accessing subject matter expertise beyond our home institutions.

Balancing Mentorship, Friendship, and the Politics of Academic Medicine

NR IMPACT uses Slack to facilitate rapid communication and foster a strong sense of community among members. There are a plethora of channels dedicated to specific projects, funding and job opportunities, protocols, specific meetings/conferences where there will be a critical mass of members, and a celebration of milestones and achievements. The Slack space is a confidential and safe space that provides answers and advice no matter the topic. Because NR IMPACT members are at various career stages and different types of academic institutions, most topics can be addressed within the group. This not only provides a valuable resource for obtaining advice to help navigate struggles and challenges, but also serves as a space to celebrate the successes. This sense of community is particularly important during the transition from trainee to faculty member.

Engaging With Patients, Advocates, Donors, and Clinicians

NR IMPACT identifies patient advocacy groups and encourages collaborations that support research. NR IMPACT member Ayesha Shajahan-Haq and patient advocate Jamie Holloway are coauthors on a manuscript outlining best practices for effective relationships between scientists and advocates [18]. In 2022, NR IMPACT had a Zoom session dedicated to working with patient advocates, featuring 6 advocates representing different patient populations. The patient advocates shared their perspectives on why they partner with academic and clinical researchers and how to maintain and nurture those partnerships. Key takeaways from this session were the importance of (1) bidirectional

communication in a safe and trusting space, (2) engaging patient advocates early in the development of research projects/grant proposals, (3) using social media to identify patient advocates willing to collaborate, and (4) recognizing and mitigating the financial and logistical complications that might prevent patients or advocates from engaging with or supporting scientists. There was also robust discussion of the role institutional leadership (especially at cancer centers), scientific societies, and funding agencies play to facilitate and foster collaborations between researchers, clinicians, patients, advocates, and other stakeholders. NR IMPACT plans to do more work to support members who do not have access to such partnerships at their home institutions.

NR IMPACT Meetings

The in-person NR IMPACT meetings, held every 2 years, are essential for building camaraderie and trust. NR IMPACT members volunteer to host meetings at their home institutions, and NR IMPACT members pay their own way (although we are grateful to receive sponsorships, sponsors have no input into the content of the meeting). IMPACT22 was at the Huntsman Cancer Institute at the University of Utah, hosted by Drs Gertz and Basham and cosponsored by the University of Colorado Cancer Center. IMPACT24 was at the University of Illinois Urbana-Champaign hosted by Drs Zeynep Madak-Erdogan, Erik Nelson, and Sayee Anakk.

The goals of each meeting are: (1) to facilitate peer mentoring between NR IMPACT members, (2) to enhance collaboration among NR IMPACT members, and (3) to provide networking opportunities between NR IMPACT members and local researchers, with the hope of expanding the mentoring network of local trainees to include members of NR IMPACT from other institutions.

Meetings are 3 days long. The first 2 days are discussions open only to NR IMPACT members. Topics include providing feedback on grant applications and discussing ideas for new, collaborative research projects. The third day is open to all and emphasizes interactions between NR IMPACT members and the local scientific community. This typically includes talks from NR IMPACT members and faculty or trainees at the host institution (who are not members of NR IMPACT), followed by a poster session presented by trainees. Meals and breaks in between the talks provide opportunities for NR IMPACT members to network with trainees.

The Future of NR IMPACT

As members advance in their careers, there will be natural turnover as leaders step down and members transition to emeritus status. NR IMPACT is typically led by 3 to 4 members. Some original chairs have stepped down because of the demands of their professorships and have been replaced by newer members. As NR IMPACT continues to grow, we anticipate that this turnover will be natural and that members will remain in leadership positions for 3 to 4 years.

NR IMPACT is fostering a community of trusted early- and mid-career nuclear receptor biologists. This has filled a critical gap in the nuclear receptor field to support the success of new investigators. Members benefit from the shared expertise and values of the group, with an emphasis on interdisciplinary collaboration. For assistant and associate professors at institutions where there are few nuclear receptor biologists, NR

IMPACT is invaluable as a resource and support system. NR IMPACT is successful, as evidenced by numerous collaborative publications, successful joint grant applications, and network effects such as raising the profile of our members through invited seminars. Ongoing efforts include continuing to support the development of multi-PI grant applications, organizing symposia and scientific meetings related to nuclear receptor biology, and helping postdoctoral fellows in the nuclear receptor field transition to a faculty position. NR IMPACT may also serve as a model for other fields in biology to advance the careers of diverse investigators.

Funding

The IMPACT22 meeting was supported by the Huntsman Cancer Institute at the University of Utah, the University of Colorado Cancer Center, and funds from the National Cancer Institute (P30CA042014, P30CA046934). The IMPACT24 meeting was supported by funds from the University of Illinois Urbana-Champaign (School of Molecular & Cellular Biology, Department of Molecular and Integrative Physiology, Personalized Nutrition Initiative, and the UIUC Cancer Center).

Author Contributions

L.S.T. is a member of the *Journal of the Endocrine Society* editorial board as an associate editor and played no role in the Journal's evaluation of the manuscript. D.A.G. is an Editorial Board Member for *Journal of the Endocrine Society* and played no role in the Journal's evaluation of the manuscript.

Disclosures

Authors have nothing to declare.

Data Availability

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

References

1. Sikora MJ, Riggins RB, Madak-Erdogan Z. Making an IMPACT on career development for early- and mid-career faculty. *Endocrinology*. 2021;162(3):bqaa247.
2. Santaliz Casiano A, Lee A, Teteh D, Madak Erdogan Z, Treviño L. Endocrine-disrupting chemicals and breast cancer: disparities in exposure and importance of research inclusivity. *Endocrinology*. 2022;163(5):bqac034.
3. Bahnassy S, Sikora MJ, Riggins RB. Unlocking the mysteries of lobular breast cancer biology needs the right combination of pre-clinical models. *Mol Cancer Res*. 2022;20(6):837-840.
4. Barton M, Frigo DE, Madak-Erdogan Z, Mauvais-Jarvis F, Prossnitz ER. Steroid hormones and receptors in health and disease: a research conference co-organized by FASEB and the international committee on Rapid Responses to Steroid Hormones (RRSH), May 25-27, 2021. *FASEB J*. 2021;35(11):e21858.
5. Baek AE, Krawczynska N, Das Gupta A, et al. The cholesterol metabolite 27HC increases secretion of extracellular vesicles which promote breast cancer progression. *Endocrinology*. 2021;162(7):bqab095.
6. Treviño LS, Gorelick DA. The interface of nuclear and membrane steroid signaling. *Endocrinology*. 2021;162(8):bqab107.

7. Hancock GR, Gertz J, Jeselsohn R, Fanning SW. Estrogen receptor alpha mutations, truncations, heterodimers, and therapies. *Endocrinology*. 2024;165(6):bqae051.
8. Sikora MJ, Ostrander JH. A path to precision metabolic treatment in breast cancer: riluzole, glutamate signaling, and invasive lobular carcinoma. *J Endocr Soc*. 2024;8(2):bvad171.
9. Sottnik JL, Shackleford MT, Robinson SK, *et al*. WNT4 regulates cellular metabolism via intracellular activity at the mitochondria in breast and gynecologic cancers. *Cancer Res Commun*. 2024;4(1):134-151.
10. Fu R, Walters K, Kaufman ML, *et al*. In situ spatial reconstruction of distinct normal and pathological cell populations within the human adrenal gland. *J Endocr Soc*. 2023;7(12):bvad131.
11. Blanchard Z, Rush CM, Arnesen S, *et al*. Allele-specific gene regulation, phenotypes, and therapeutic vulnerabilities in estrogen receptor alpha-mutant endometrial cancer. *Mol Cancer Res*. 2023;21(10):1023-1036.
12. Leo J, Dondossola E, Basham KJ, *et al*. Stranger things: new roles and opportunities for androgen receptor in oncology beyond prostate cancer. *Endocrinology*. 2023;164(6):bqad071.
13. Hahn AW, Siddiqui BA, Leo J, *et al*. Cancer cell-extrinsic roles for the androgen receptor in prostate cancer. *Endocrinology*. 2023;164(6):bqad078.
14. Warde KM, Smith LJ, Liu L, *et al*. Senescence-induced immune remodeling facilitates metastatic adrenal cancer in a sex-dimorphic manner. *Nat Aging*. 2023;3(7):846-865.
15. Ren P, Tiede C, Fanning SW, *et al*. Labeling of a mutant estrogen receptor with an affimer in a breast cancer cell line. *Biophys J*. 2022;121(19):3651-3662.
16. Nelczyk AT, Ma L, Gupta AD, *et al*. The nuclear receptor TLX (NR2E1) inhibits growth and progression of triple-negative breast cancer. *Biochim Biophys Acta Mol Basis Dis*. 2022;1868(11):166515.
17. Rush CM, Blanchard Z, Polaski JT, *et al*. Characterization of HCl-EC-23 a novel estrogen- and progesterone-responsive endometrial cancer cell line. *Sci Rep*. 2022;12(1):19731.
18. Salamone JM, Lucas W, Brundage SB, *et al*. Promoting scientist-advocate collaborations in cancer research: why and how. *Cancer Res*. 2018;78(20):5723-5728.