Neuroendocrinology Letters Volume 40 No. 1 2019
ISSN: 0172-780X; ISSN-L: 0172-780X; Electronic/Online ISSN: 2354-4716
Web of Knowledge / Web of Science: Neuroendocrinol Lett
Pub Med / Medline: Neuro Endocrinol Lett

The Lindau Nobel Laureate Meeting 2018: Added value – and reflection – for participants, institutes and disciplines

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Submitted: 2019-02-13 Accepted: 2019-04-08 Published online: 2019-05-12

Key words: **Lindau; Nobel Laureates; young researchers; institutes; discipline; internal clock; role of science; science communication**

Neuroendocrinol Lett 2019; **40**(1):1–4 **PMID:** 31184815 NEL400119L01

Abstract

Since 1951, Lindau Nobel Laureate Meetings have promoted scientific exchange between laureates and young researchers across generations and cultures. In 2018, the conference on Lake Constance focusing on "Physiology/Medicine" brought together 39 Nobel Laureates and 600 young scientists from 84 countries. This empirical contribution illustrates added value that the extraordinary offer of knowledge and experience by so many Nobel Laureates has for young participants, institutes and disciplines, and it provides reflection.

Scientific careers rely on inheritance, environment, and random events like all biological phenomena.

- Rosbash 2017 (Rosbash, 2017)

INTRODUCTION

This empirical contribution summarises experiences gained at the 68th Nobel Laureate Conference in Lindau. These experiences relate to diverse added value for participants, institutes and disciplines, and we provide reflection.

From 24 to 29 June 2018, some 600 young scientists met in Lindau on Lake Constance to participate in the 68th Lindau Nobel Laureate Meeting (Physiology/Medicine). Thirty-nine laureates met with students, doctoral students and postdocs from 84 countries. Young physicians and natural scientists (including PL as one of the authors) represented disciplines with a vast array of different focuses ranging from genetics and molecular biology in cell and animal models to epidemiology.

Since their beginnings in 1951, facets of the Lindau meetings have been dealt with by young scientists (Lancaster, 2009) and journals (Cantrill, 2009; Simmons, 2010; Roberts & Wagner, 2015). That added value is not confined to young scientists was described by Martin Chalfie (Nobel Prize in Chemistry 2008) under the title "Learning from students in Lindau" (Chalfie, 2009). That so many Nobel Prize winners share extraordinary knowledge and experience with young scientists and discuss current and future challenges for science at the highest level in one working week certainly makes these Lindau conferences unique.

MAIN TOPICS 2018

In 2018, the focus was on topics such as the internal 24-h clock (Lewis *et al.* 2018). US researchers Jeffrey Hall, Michael Rosbash and Michael Young were honoured in 2017 for discoveries of what makes the clock tick in the fruit fly and other organisms. With their opening lectures "The History of Circadian Rhythms: Past, Present and

COMMENTARY

Fig. 1. Philip Lewis (second from right) and other young scientists with Nobel Laureate Elizabeth Blackburn (fourth from right) in Lindau. Photo/Credit: Courtesy of Lara Urban

Future" and "Circadian Rhythms and their Effects on Physiology and Behaviour" Rosbash and Young offered fascinating insights into research. It is certainly remarkable that the inner clockwork elucidated by them represents an all-embracing legacy across species. In the near future, research into how internal clocks affect health and disease promises to provide significant insights (Lewis *et al.* 2018).

In addition, the meeting focused on other timely issues such as personalized medicine, genetic engineering, diseases (old and new), hunger, environmental consequences of pollution and climate change, the role science can play in a "post-factual era" and challenges within the "academic world" such as the different proportions of women and men in science.

YOUNG PARTICIPANTS

That only two Nobel Prize winners, Ada Yonath (Nobel Prize in Chemistry 2009) and Elizabeth Blackburn (Nobel Prize in Medicine/Physiology 2009) [Fig. 1], were women in Lindau in 2018 must be thought-provoking (Erren *et al.* 2014). In line with this, 776 Nobel Prizes have so far been awarded to men and only 51 to women. That 50% women and 50% men were selected for the 600 young scientists is intended (Bernadotte *et al.* 2015) and appropriate (Angell, 2014). To make women and their research more visible, the blog "Women in Research" offered a series of interviews with young participants at the 68th Lindau Nobel Laureate Conference [Comment 1].

An essential feature of the Lindau meetings is that a new generation of scientists meets the prize winners as an impressive group and also interacts 1:1 with them. In addition to academic input, scientists under the age of 35 will gain insights into the personality of the award winners through informal exchanges and anecdotes. The prize winners gave a lot of well-meant advice, but its application can sometimes be difficult for young scientists. In fact, young researchers may find it easier to follow some of the advice given by Nobel Laureates if they have already achieved something substantial and/or can afford "novel paths".

Example 1: Randy Schekman (Nobel Prize in Medicine/Physiology 2013) and Harold Varmus (Nobel Prize in Physiology/Medicine 1989) criticized when individual works are inappropriately valued via the impact factor (IF) of the journal where they are published. Indeed, where someone publishes should not be identified on the basis of IFs. In principle, however, it can be challenging for young researchers to ignore journals with a high IF, such as Nature, Science or Cell, which were criticised by Schekman, and to rely on new journals such as eLife – despite advantages such as their open and partly non-anonymous peer review.

Example 2: The importance of scientific quality could not be stated too strongly. Nevertheless, the "publish-or-perish" paradigm will be a part of the careers of many scientists. Many Lindau participants will have to combine quality and a certain quantity of research; only very few, if any, could follow the example of Higgs (Nobel Prize in Physics 2013), for whom the Web of

Science literature database for 1953-2014 lists 22 (!) publications [Comment 2: The Guardian "Peter Higgs: I wouldn't be productive enough for today's academic system"].

INSTITUTES

Young participants came from some of the world's most important but also from less renowned institutes and institutions. The participating author has worked at University College Dublin and University College Cork as well as at the University of Cologne [Comment 3].

Being selected for Lindau is also important for the institutes in 84 countries where the qualifying work was carried out. Within the framework of various formats such as poster sessions, master classes and laureate lunches, the young scientists can further increase the visibility of their institutes in Lindau with their work, ideas and personalities. In this respect, it is certainly an added value for institutes to be associated with young scientists who are selected to participate in meetings of Nobel Laureates in Lindau.

DISCIPLINES

Furthermore, it can be an added value for disciplines if they can contribute to becoming participants in Lindau. For example, experimental results in flies, hamsters, mice and rats may be relevant to the understanding of circadian disruption classified as "probably" carcinogenic by the WHO's International Agency for Research on Cancer when linked with shift work (IARC 2010). But a key question must be answered: "To what extent can we transfer results from animal experiments to humans?"(Erren *et al.* 2011). In regards to "probably" carcinogenic effects due to perturbments to internal clocks, occupational medicine can provide important insights through studies on shift personnel ["Shift work experiment" → work/life against our internal clock] (Erren & Lewis, 2019). That occupational medicine, which studies the interactions between people and work, contributes to projects that qualify for Lindau participation, is rather unusual, but certainly not a disadvantage for the discipline.

CONCLUSIONS

In line with the 2018 motto "Educate. Inspire. Connect" [Comment 4], the Lindau Nobel Laureate Meetings offer an environment with added value [Table 1] for [not only young – Chalfie (2009)] participants, institutes and disciplines. The open discussions among and with Nobel Laureates and among young scientists with diverse professional interests and backgrounds are remarkable and can lead to immediate collaboration (Lewis & Depp, 2019). Lindau is also thought-provok-

Tab. 1. Lindau-facets with added value for young participants, institutes and disciplines

Young participants	For the individual, Lindau offered a different dimension to personal and professional development than "typical" conferences focusing on presenting work results to other researchers: This included - fostering interaction between researchers from a diverse range of cultural backgrounds whose research is geared toward combating/preventing problems all across the globe; - there was no laboratory group or research clique to fall back on - one had to interact with people from new disciplines and very different points of view; - encouragement to tackle major global challenges; - discussions on how to better bridge science and society; - encouragement to try to improve the "academic industry"; - learning about innovative work from countries one would have less interaction with at conferences closer to one's field; - learning from the experiences of the 39 Nobel laureates.
Institutes	- less prestiguous institutes gained visibility by being well represented by excellent young scientists; - work and challenges of more and less renowned institutes were presented and promoted to a multidisciplinary, global audience; - future institute leaders will have learned a lot from and about other institutes, cultures and problems all across the world.
Disciplines	- being associated with the conference can increase the visibility of – and thus have added value for – a discipline; - exposing individuals and institute representatives to young researchers from different disciplines can help to increase recognition of (perhaps lesser-known) disciplines - for instance, circadian molecular biology may be translated from the bench to a public health context via occupational medicine.

ing – for example in view of the fact that comparatively few women have adequate opportunities to receive Nobel Prizes.

Overall, with reference to the quotation from Rosbash prefacing this contribution, we find that Lindau offers important opportunities for developing a scientific career: A highly stimulating "environment" and – after 68 consecutive meetings since 1951 – a "non-random event" for which an application is really worthwhile.

COMMENTS

Comment 1 Women in research blog: https://www.lindau-nobel.org/tag/women-in-research/; Accessed on February 16, 2019.

Comment 2 The Guardian 2013: Higgs: Peter Higgs: I wouldn't be productive enough for today's academic system. … Peter Higgs, the British physicist who gave his name to the Higgs boson, believes no university would employ him in today's academic system because he would not be considered "productive" enough. The emeritus professor at Edinburgh University, who says he has never sent an email, browsed the internet or even made a mobile phone call, published fewer than 10 papers after his groundbreaking work, which identified the mechanism by which subatomic material acquires mass, was published in 1964. He doubts a similar breakthrough could be achieved in today's academic culture, because of the expectations on academics to collaborate and keep churning out papers. He said: "It's difficult to imagine how I would ever have enough peace and quiet in the present sort of climate to do what I did in 1964." https://www.theguardian.com/science/2013/dec/06/peter-higgs-boson-academic-system; Accessed on February 16, 2019

Comment 3 ARD-alpha contribution by Dr. Philip Lewis: Campus Talks: Kann die Licht-Umgebung zur Zeit der Geburt eines Menschen dessen spätere Gesundheit beeinflussen? https://www.br.de/mediathek/video/dr-philip-lewis-einfluss-von-licht-bei-der-geburt-av:5baa9784c9d2a60018633c02; Accessed on February 16, 2019

Comment 4 https://www.lindau-nobel.org/blog-educated-inspired-connected/; Accessed on February 16, 2019

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