

Background to 'NextGenChem@NL' and summary of recommendations to NWO

NextGenChem@NL is a symposium organized yearly to bring together young independent researchers across all chemical disciplines. The symposium is a one-day scientific meeting where participants have the opportunity to share their research projects, with ample time for discussion. Next to the scientific discussions there is also time scheduled to discuss a more general topic, typically one that affects all researchers. Topics range from career and publishing tips to women in academia, to the current topic of the future of funding.

On June 7th 2018, NextGenChem@NL¹ took place in Amsterdam with 36 registered participants of various chemical backgrounds working at 16 different Dutch universities and research institutes. All participants were at the Veni/Vidi/ERC-StG/Tenure track career stage. In the afternoon, an interactive panel discussion took place on the topic '*The Future of Funding*', for which we had invited Dr. Dirk-Jan den Boer (NWO, Director of Social Sciences and Humanities (SSH), Chair of the program Reducing Application Pressure),² Prof. Dirk Slotboom (University of Groningen, member of the '*Chemietafel*'), and Prof. Joost Reek (University of Amsterdam). All panel members had the opportunity to briefly present their views on the subject. The audience then voted on 15 propositions, three from the panel and twelve from the organization (see Table 1 for outcomes). Finally, a discussion took place based on the input of the panel and the propositions (particularly those on which the audience was polarized). The general challenges and solutions relayed below present the highlights of our discussion and led to the following **eight recommendations to NWO**:³

A. Reducing the application pressure in the VI scheme

1. Start a small grant (€ 20-100k) for early-stage researchers with very high success rate (>80%);
2. Include a pre-proposal for all Veni and Vidi grants;

B. Increasing the amount of funding

4. Present the success rates of career-determining grants to politicians in a more realistic way;
5. Create a more effective (perhaps professional) lobby;

C. Networking opportunities for early-career researchers

6. Develop a website to connect early-stage chemists with each other and to senior researchers;
7. Organize a workshop and/or networking event for foreigners;
8. Clear rules for consortia formation, including incorporation of (an) early career researcher(s);

Introduction to the discussion topic 'The Future of Funding'

The VI talent scheme⁵ is generally regarded as important for someone's chances of making a scientific career in the Netherlands. The currently low success rate for the VI grants is stressful for early career researchers, particularly as they are in a period of their lives where future job security is an important driver for making other life choices (e.g. location of residence, starting a family). Of the ~600 Vidi applications each year, ~90 are granted (~15%); only about 10 of these are for research in the chemical sciences – broadly interpreted (i.e., < 2%).⁴ There is a generally felt frustration that low success rates entail a high risk for wasting valuable time and cognitive resources. Consequently, there is much interest in ways to reform the VI talent scheme applications in order to increase the rate of success. This can in principle be achieved in two ways: decrease application pressure and/or increase the amount of funding.

¹ <http://nextgenchem.nl/>

² <https://www.nwo.nl/en/documents/nwo/strategy/measures-to-reduce-application-pressure>

³ These recommendations are formulated by the organizers and not by the members of the panel

⁴ <https://www.nwo.nl/en/about-nwo/media/annual+report>

A. Reducing the application pressure in the VI scheme^{2,5}

A recently implemented measure has been to require an embedding guarantee from the university where the Veni or Vidi research is going to take place. This measure has two potential (beneficial) implications: 1) the number of applications will reduce because some researchers will not obtain the necessary embedding guarantee, and 2) especially the Vidi researchers will obtain a tenure-track position with the outlook of a fixed position at the university. While these are potentially rewarding outcomes, the following disadvantages were identified. Under these parameters the Veni and Vidi application process will include a 'political' element. Indeed, universities can pre-select the candidates/research, which in turn may be detrimental to highly innovative ideas. Moreover, this measure may even further decrease the chances that non-Dutch applicants obtain a Veni/Vidi grant.

It was discussed whether implementing additional selection criteria could also reduce the application pressure (e.g. international experience, outreach). However, it was concluded that such measures would risk selecting on the wrong/irrelevant parameters, and as a result, the success rate would be artificially skewed to a more positive number.

It was also considered to eliminate competitive funding entirely and substitute it for distributing the money equally over early career academic staff members. While this prospect is tempting from a time-investment perspective, most agreed that some level of competition is healthy and that writing proposals helps to clearly articulate ideas. However, the pressure to obtain grants, and the grim prospect when one is not successful in attracting a VI/ERC grant currently overshadows the positive elements of competition. *To remedy this predicament, we propose to include a new type of grants, called Discovery Grants NL, with a small budget (20-100 kEUR) that early-stage researchers can apply for and has a very high (>80%) success rate.* This idea is inspired by the current Discovery Grants scheme in Canada.⁶ This gives young researchers (post-doc/UD) the chance to attract independent funding, which is important for their careers, while at the same time having an opportunity to write a grant and sell ideas in a semi-competitive scheme.

It also became clear that one of the factors that determine the relatively low rate of success is that too many people apply. It was the opinion of the panel that the ~600 annual applicants can be divided into three categories: ~25% with strong CV's and fundable proposals (i.e., about 150 people, ~90 of whom will be funded), ~25% with poor CV's and unfundable proposals and ~50% in between (poor CV or unfundable proposal). *As experienced assessors of proposals can tell beforehand whether an application will stand a chance, we propose to include a pre-proposal for all Veni/Vidi grants (as recently implemented in NWO domains SSH and AES).* This pre-proposal may include a thorough CV, personal motivation, short summary of proposed research, and knowledge utilization. This process can help applicants to decide whether to write a full proposal or not, possibly saving valuable time of both applicant and reviewers. Moreover, it is believed that the top 25% of applicants will not be discouraged by this measure, which means that the reform might have an immediate and positive effect on the success rate. On the other hand, it was acknowledged that even under reduced application pressures there is still not enough funding to cover these ~150 top-scientists.

⁵ <https://www.nwo.nl/en/research-and-results/programmes/Talent+Scheme>

⁶ http://www.nserc-crsng.gc.ca/Professors-Professeurs/Grants-Subs/DGIGP-PSIGP_eng.asp

B. Increasing the amount of funding

While reducing the application pressure can be beneficial (*vide supra*), the more pressing issue is that there are too many top-tier scientists, but not enough money to support them all. An obvious remedy for this predicament is to convince society/politics to spend more money on science. The aim could be to annually fund at least the top ~150 people (~25% under current pressure). The money ideally originates both from primary university research funds and open competitions (e.g. NWO Veni/Vidi). This, however, is a notoriously difficult task. Indeed, even the recent Nobel prize in chemistry did not cause politicians to increase funding (perhaps even the opposite, as the Nobel prize can also be seen as a confirmation that academic researchers flourish).

Nevertheless, two opportunities were identified: Firstly, we (and particularly NWO) could **present the data on success rates in a way that better reflects reality**. In the statistics currently communicated to the minister it appears as though the success rate of grant applications is 30% (*double* the ~15% for VI scheme grants).⁷ The reason for this –in our opinion skewed– representation is that success rates for relatively inconsequential (and small) grants are averaged with the talent program grants. For example, in answers of the minister to questions from the parliament (dated April 26th 2018), the 2445 talent scheme grant applications with a success rate of 17% are averaged with the 336 applications for research facilities and equipment which had a 67% success rate.⁶

Secondly, we as scientists should **create a more effective lobby** and do so in a less partisan manner (an issue that impaired a previous attempt at lobbying). A suggestion that might aid such a lobby is to compute the (monetary) impact of science on the Dutch economy as a (presumed) flagship argument for increased investment. If possible, such a lobbying effort could be professional with one or more permanent lobbyists.

C. Networking opportunities for early-stage researchers

An important aspect of establishing a scientific career in the Netherlands and in securing funding is growing a network. The NextGenChem@NL symposium aims to connect early career scientists together, which certainly helps to achieve this goal. However, networking opportunities are desirable where early career and more senior scientists can meet each other and explore job opportunities and/or collaborations. We as NextGenChem@NL thus aim to **develop an intermediary networking website** where early-career chemical scientists can stay in touch and profile themselves. This website can be a useful tool for those looking to hire early-stage researchers to complement their research team.

During the discussion it was also brought to our attention that the Dutch scientific community is a tightly-knit network, and especially for foreigners it is difficult to become a part of this. We propose that NWO takes the initiative to offer **a workshop and/or organize a networking event** for their international VI scheme grantees, to empower them to connect to other Dutch scientists, and maybe even find a mentor.

Finally, it was noted that an increasing number of proposals, including the NWA ('*Nationale WetenschapsAgenda*'), require the establishment of a (large) consortium. These consortia are often formed by connecting with researchers in your network. Since many early-stage researchers do not yet have a large network, it is difficult to start a consortium or be included in a consortium as partner. This impairs the chances for early-stage researchers to acquire such funding. *We thus propose to make clear rules about the requirements for the consortia, including the demand for (an) early career participant(s)*. Such a demand could be an ideal mechanism for starting and established researchers to team up (and transfer knowledge).

⁷ <https://www.rijksoverheid.nl/documenten/kamerstukken/2018/04/26/kamerbrief-met-reactie-op-vragen-over-uitwerking-investeringen-in-wetenschap-en-onderzoek> (see the table under point 4 with number of applications (number of grants): Talent scheme: 2445 (415); Free competition: 915 (266); Research facilities and equipment: 336 (224); Social challenges: 1063 (464); Other: 1040 (375)) .

Table 1. Propositions and opinions of the audience. *N* = number of votes; A = agree; D = disagree; NO = No Opinion. The propositions with an ‘*’ were further discussed during the meeting due to the polarized outcome.

| | Propositions | <i>N</i> | Opinion in % | | |
|-----|--|----------|--------------|-----|----|
| | | | A | D | NO |
| 1 | Prof. Slotboom: The intent of NWO to provide VIDI grants only to candidates that are offered a tenure-track position is in conflict with the goals of the innovation-impulse and potentially interferes with innovative research. | 27 | 63 | 30 | 7 |
| 2 | Prof. Reek: Writing proposals is an essential part of science; ideas must be formulated as sharp as possible. | 28 | 64 | 36 | 0 |
| 3 | Dr. den Boer: Pre selection based on CV in the VENI is an efficient and effective means of limiting the amount of work researchers have to do when applying for an VENI grant. | 29 | 35 | 58 | 7 |
| 4* | The current peer review system of proposals relies too heavily on referee reports. | 28 | 29 | 46 | 25 |
| 5* | Large research consortia hamper the career of young scientists (e.g. by restricting access, usurping funding and/or obscuring visibility). | 28 | 46 | 43 | 11 |
| 6 | There is too much money for research staff and funds could better be invested in fewer people and more equipment | 28 | 14 | 82 | 4 |
| 7 | Attributing the majority of funds to a limited number of ‘successful’ researchers is the most fruitful strategy to advance science. | 29 | 0 | 100 | 0 |
| 8* | Young (~30 – 35) scientists have too few opportunities to develop an independent research career. | 28 | 68 | 29 | 4 |
| 9* | Providing all faculty members with baseline funding covered by abolishing competitive government funding will be beneficial for the quality of science. | 29 | 55 | 44 | 3 |
| 10 | Diversity in age, gender, and career stage is needed in consortium formation. | 29 | 62 | 21 | 17 |
| 11 | The government has overreached in determining the research agenda and with it the kinds of projects that are funded (e.g., matching from industry is often required). | 29 | 69 | 7 | 24 |
| 12 | Implementation of the "Self-Organized Fund Allocation"-strategy is only favorable for established researchers but has no value to young scientists. | 28 | 50 | 36 | 14 |
| 13 | There is too much money being diverted to non-academic overhead costs (e.g. CVB, trainers, media matters, admin, etc.). | 29 | 55 | 28 | 17 |
| 14 | For-profit publishers should invest in young talent by means of their own research funding (500k+). | 27 | 37 | 41 | 22 |
| 15* | Additional criteria are needed to determine who is eligible for funding (e.g. h-index, post-doc abroad, pre-peer review evaluation of proposals and CV's by experts). | 29 | 45 | 45 | 10 |

This document was written by the organizers of the 2018 NextGenChem@NL symposium.

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