Receiver(s): Departments and centres at the Faculty of Natural Science and the Faculty of Technical Science.

Villum Young Investigator 2022 – Benchmarking

CV of a competitive Villum Young Invesitgator applicant should include:

- Strong international career and possibly/preferably not originally from AU
- Should have publications without PhD supervisor
- Career level (position) matters. Assistant or even associated professors (not more than two years standing) seem more likely to get a grant than senior postdocs.
- Experience with supervision, or at least involvement/co-supervising (bachelor projects, etc.) is valuable.

Executive summary, bibliometric analysis and Villum Foundation focus

The bibliometric analysis of all 2018, 2019, 2020 and 2021 Villum Young Investigator grantees shows a number of parameters that future VYI applicants can be benchmarked against. In addition to the analysis, summed up in the table below, other factors should be taken into account, when selecting competitive candidates for the VYI 2022 call. The Villum Foundation focuses on a strong letter of support from the host department and would like to see an international profile along with supervising experience from the applicants.

Compared to the 2020 and 2021 benchmarking, this year's benchmarking confirms previous trends with only slight changes in the various percentages under the listed focus points (1-7). As such, no new trends are emerging and it seems the 'Ideal Villum Young Investigator candidate' displayed in the table below is still valid.

Ideal Villum Young Investigator candidate	
Scientific age	10-11
Citations pr. publication	>20
Field Weight Citation Impact	>1,5
Top 10% journals	>60% of publications
International collaborations	>50% of publications with int. collaborators
H-index	>10

Bibliometric analysis of VYI grantees '18 (21), '19 (15), '20 (19) and 21' (16).

For each grantee, data has been collected from a 4 (2018) or 5 (2019, 2020, 2021)[1] year time period prior to receiving the Villum Young Investigator grant. The analysis displays some statistical uncertainties due to the small sample size – younger researchers

[1] Bibliometric data has been collected in SciVal. Unfortunately, customized time spans are not possible in the module from which data is retrieved. Thus, for the 2018 grantees, data has been drawn from the period

have a relatively limited number of publications. Nevertheless, it is possible to see overall patterns in terms of 'research age', publications, citations, etc. that are typical for a VYI grantee.

1. Scientific age (incl. PhD period).
   The scientific age is calculated from the first year a given publication is registered in Scopus to the year of the grant.
   Approximately 37% of the grantees had a scientific age of 10-11 at the time they received a Villum Young Investigator grant. Although the formal research experience of the applicants has to be between 2 and 8 years (after PhD), as stated in the call, the bibliometric analysis shows that 63% of the grantees lie in the last segment of this eligibility window. If you include the fraction of grantees with a scientific age of 8-9, the percentage reaches 85%. Thus, noticeably more than three quarters of Villum Young Investigator grantees lie in the upper half of the eligibility window, when it comes to scientific age.

2. Publications pr. year.
   The majority of grantees (app. 70%) have produced 1-4 publications pr. year (31% 1-2; 39% 3-4) at the time they received a VYI grant with one fourth being more productive. If this parameter is taken into account evaluating applicant CV's, it would seem that there is a focus on quality rather than quantity.

3. Citations pr. publication.
   The number of citations pr. publication of 51% of VYI grantees were between 20 and 50. 22% of the grantees had produced publications that attracted more citations at the time of the grant, and 28% were cited less than 20 times pr. publication. Thus, this doesn't seem to be an evaluation criteria as such, when assessing the productivity of the applicants.

4. Field Weight Citation Impact (FWCI).
   This is a measure of how well a researcher 'performs', relative to the average, within a given scientific field, defined by SciVal. The strength of the metric is somewhat proportional to the number of the publications used in the calculation. A fraction (9%) of the grantees performed less than the average and 32% were on average or performing almost 'twice as good', at the time of being awarded a VYI grant. 35% of the grantees analysed here outperformed the average with a factor 2-3 and nearly a quarter displayed even better FWCI metrics with numbers above 3. With this bibliometric analysis in mind, it seems that almost 60% of VYI grantees outperforms the average researcher within a given scientific field by a factor 2 or more.

2014-2018, data for the 2019 grantees from the period 2014-2019, data for the 2020 grantees from the period 2015-2020 and data from 2016-2021 for the 2021 grantees.

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5. Top 10% journals.
   Nearly two thirds of the VYI grantees publish 60-100% of all their publications in the top 10% highest ranked journals, at the time they received a grant.

6. International collaborations
   Of all the 2018, 2019, 2020 and 2021 VYI grantees, 84% produced half of their publications in collaboration with international peers. Whether this reflects work done at a foreign research institution and/or a strong international network, cannot be determined through the bibliometric analysis. Nevertheless, it does reflect at strong international outlook.

7. Hirsch-index (h-index).
   Even though the h-index can be used as a metric of a researcher's productivity and impact, it is not always applicable when comparing different scientific fields. Nevertheless, the h-indexes of 2018, 2019, 2020 and 2021 VYI grantees have been calculated to give an idea of the scientific level of the successful applicants. 41% of the grantees had a h-index between 10 and 15 and roughly 27% were in the 16-20 range, at the time of receiving a grant. Approximately fourteen percent had an h-index lower than 10 and 20% displayed higher productivity and research impact with an h-index ranging above 20. More than anything, this reflects the range in research age between the grantees and it is difficult to state that a certain h-index is a minimum requirement, in order to receive a Villum Young Investigator grant.

Focus from the Villum Foundation

"A Villum Young Investigator grant is expected to be a "defining grant" that enables the grantee to establish the first research group he/she will lead and allows the grantee to demonstrate independent leadership in science."
"Applicants are selected based on their research accomplishments, creativity and potential to become research leaders."

The letter of support provided by the department hosting the future grantee is highly important. The department must clearly demonstrate its support and recognition of the application, stating whether the applicant has the scientific qualifications to be considered for a tenure track position. The department should emphasize the applicant's chances of obtaining a tenure track or permanent position, should the application be granted.

There is a focus on
- value for money
- the good story (impact)
- enthusiasm and engagement at the interview

Highlights of the VYI 2022 call

Link: https://veluxfoundations.dk/en/call-villum-young-investigators

Total budget: 130 mio. DKK
5 year research grants.
Note: It is not possible to apply for a grant period of less or more than five years!
PhD age: 2-8 years.

6 mio. DKK (incl. 15% indirect costs) for applicants already employed by a Danish research institution.
8 mio. DKK (incl. 15% indirect costs) for applicants currently employed at a foreign research institution and have been for at least two of the past three years prior to the deadline.

Restrictions:
"Applicants may apply a total of two times (e.g in 2021 and 2022)."

Important considerations

Applicants are expected to form a research group of at least two researchers in addition to the PI (applicant). This puts heavy restraints on the budget if the applicant must apply for her/his own salary.
E.g.:

- PI salary (assistant. prof. level):		3.030.000 DKK
- Postdoc salary (2023-2024):		1.130.000 DKK
- PhD salary (2023-2025):		1.390.000 DKK
- Tuition fee:		240.000 DKK
- Indirect costs (15%):		870.000 DKK
	Sum:	6.660.000 DKK

VYI Programme Evaluation

In 2017, The Villum Young Investigator programme was evaluated based on the period 2012-2017[2]. The analysis was conducted to answer whether the VYI programme impacted scientific performance and career paths of the grantees. From a benchmarking perspective a few highlights can be extracted:

1. Almost 40% of the 2012-2017 grantees obtained their PhD outside Denmark. Fifty two different nationalities have applied for a VYI grant.[3]

2. Just above 30% of grantees in the same period had a permanent position (incl. tenure track) when applying for a VYI grant. Half of those that did not have a permanent position when applying, obtained one during the grant period.

Villum Young Investigator Grantees (2012-2017)	
Permanent position	31% of grantees had at the time of application
Job title	43% postdoc
	17% assistant professor
	30% associate professor
	10% other category
Average age (both male and female)	36

Comparison to 2018 and 2019 AU DFF Sapere Aude grantees.

The AU Sapere Aude grantees follow the same bibliometric pattern as the Villum Young Investigators (and one of the 2019 SA grantees received a VYI in 2016), although the dataset is much, much smaller. Furthermore, two AU SA grantees lie outside the pattern. They are both from the field of mathematics where the used bibliometric analysis is less applicable as a means to evaluate scientific performance.

2018 and 2019 AU DFF Sapere Aude (SA) grantees	
Scientific age	10-11
Citations pr. publication	>20
Field Weight Citation Impact	>1,6
Top 10% journals	>60% of publications
International collaborations	>50% of publications with int. collaborators
H-index	>15

[2] https://veluxfoundations.dk/sites/default/files/evaluation_report_yip_final_01092017_0.pdf
[3] Information regarding where the 2018, 2019, 2020 and 2021 VYI grantees obtained their PhD and whether it follows a similar pattern have not been made.

1. Scientific age
   75% of SA grantees had a scientific age above 10 years, which is a larger proportion compared to the VYI grantees. Thus, the SA grantees seem to be slightly more senior when applying, which is perfectly in line with the Villum Foundation focus, where the VYI programme is seen as the first group-forming grant.

2. Publications pr. year
   On average AU SA grantees produces 3.3 applications pr. year. This resembles the level of VYI grantees.

3. Citations pr. publication
   50% of the AU SA grantees received 20-38 citations pr. publication (with a single grantee at nearly 150 citations pr. publication) at the time of applying. This is also similar to the VYI grantees.

4. Field Weight Citation Impact (FWCI)
   Leaving out the two mathematicians, the FWCI for the AU SA grantees is comparable to the VYI grantees, with a 'scientific performance' of 2-3 times better than the average (although the dataset is much, much smaller).

5. Top 10% journals.
   50% of the AU SA grantees publish 50-80% of all their publications in the top 10% highest ranked journals, at the time they received a grant. Due to the small sample size, it is impossible to state anything other than it is comparable to the VYI grantees.

6. International collaborations
   All of the AU SA grantees produced more than half of their publications in collaborations with international peers. Thus, it seems that the SA grantees have a slightly stronger international profile compared to VYI grantees.

7. Hirsch-index (h-index).
   Four out of six AU SA grantees have an h-index between 17 and 22. Which is somewhat higher than the VYI grantees.

Although the bibliometrics are based on a small sample size for the AU SA grantees, they are comparable to the VYI grantees. Nevertheless, the Sapere Aude grantees are performing slightly better in some parameters. This fits with the general notion that you apply for a VYI grant before pursuing a DFF Sapere Aude grant.

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