Příloha k čj. 30662/2021-UVCR

Funding Life Science and Medical Research in the Czech Republic

(Report of the RVVI *ad hoc* working group on medical research.)

Preamble

Czech education – from primary to university level – is of very high standard. This begs the question why Czech scientists are often not as competitive at international level as might be expected. Rada pro Výzkum, Vývoj a Inovaci (RVVI, The Research, Development and Innovation Council) of the Czech government has assembled an International Advisory Panel (IAP) of experts in basic and applied research, and asked it to examine the current situation in CR and make recommendations for improvements that would enhance the international standing of Czech Science.

Status Quo

In its initial deliberations, the IAP focussed on science funding infrastructure (primarily GA ČR). The IAP was able to identify several aspects of the funding process that were judged to be obsolete or incompatible with procedures that successfully support science elsewhere in Europe. The IAP made a set of recommendations (ranging from short to medium term), many of which are currently being adopted by GA ČR. The feedback to date appears to be largely positive and the IAP believes that, once the full set of changes is adopted and operational, this funding body will perform on par with the best European agencies.

At its last meeting, the IAP was asked to examine also the funding of medical research, which is currently the responsibility of Agentura pro Zdravotnický Výzkum ČR (AZV, Agency for Medical Research of the Czech Republic). This organ falls under the jurisdiction of the Ministry of Health and its scope is to support primarily applied research projects. In an attempt to gain some informed insight into the situation in AZV-funded medical research, Josef Michl asked several scientists working in the system for a candid assessment of the AZV *modus operandi*. The responses were generally rather negative; some of the criticisms involved the following:

- The committee members serve on the panel for too many years, which results in the formation of “interest groups or factions”
- Committee membership is nominated top-down rather than bottom-up
- Committee members should be more qualified (min. *h*-index > 30)
- Quality of external reviewers is too low (some don’t even have a PhD)
- Remuneration of committee members is not appropriate
- Evaluation in Czech language biases against non-Czech applicants
- Frequent conflicts of interest (committee members are often also applicants)
- Excessive bureaucracy; too much reporting, too detailed financial control, no possibility of grant transfer to a new institution, no possibility of changing goals of study, requests for naming journals where results will be published etc.)
- No possibility of extending successful grants

In order to be able to make informed comments and suggest feasible improvements, the IAP has formed an *ad hoc* working group consisting of Bohdan Pomahač, Josef Jiřičný (chair), Štěpán Jurajda, Jan Konvalinka, Josef Michl and Karel Pacák, with the goal of examining the current situation in medical research in the Czech Republic and of making a set of recommendations that could form the basis for discussions with the official organs.

Preliminary analysis

The list of rules and regulations of the AZV is unnecessarily long (109 pages) and contains aspects that are overly-bureaucratic (annual reporting, output expectations, financial budget details). However, the salient points and criteria for evaluating applications and granting awards appear to be quite similar to those of GA ČR and, indeed, also of the British and the Swiss granting agencies, with which we are intimately acquainted. **This working group therefore believes that the problems lie not with the rules and regulations, but largely with the way these are interpreted and applied.**

The AZV has a governing Science Committee (SC) and ten specialist Panels that cover the entire medical field. The SC has 16 members, ten of which are the chairmen of the specialist Panels. Of these, only five have an *h*-index over 30 (the lowest is 10). We did not examine all the Panels, but, in metabolic diseases (P01), only two of its 9 members have an *h*-index over 30, in cardiology and circulatory diseases (P02), three of 14 members have a *h*-index over 30 (the lowest is 10), in oncology (P03), three members of 17 have an *h*-index over 30 (the lowest is 10).

The scientific standing of the Panel members conforms with the requirements. A recent open call for new Panel members required only a completed habilitation, an *h*-index higher than 8 and a recent publication less than two years old. The call also expressed the intention to have as many regions of the Czech Republic represented as possible and to have an equal gender representation. However, we consider this to be rather low.

In the last round, the panels between them funded 115 projects from a total of 469 submissions (25%).

Recommendations

1. **Restructure AZV SC.** The examples of CRUK, MRC, Wellcome Foundation (all UK) and SNSF, as well as national granting agencies of states of comparable size to the Czech Republic (Austria, Belgium, Holland) demonstrate that it is possible to fairly and constructively evaluate and support medical research (both basic and clinical), using panels composed of a combination of clinicians and scientists. These two groups complement each other, inasmuch as both can ask penetrating and critical questions pertaining to the evaluated projects. This helps, on the one hand, attain higher scientific standards in clinical research and, on the other, reflect on the clinical relevance of basic science projects. Given the above analysis, we recommend that:

a. the AZV eliminate its specialist panels (as they contain a number of persons of limited scientific stature) and create a single Science Committee composed of 30-35 top clinicians and life scientists. With the support of external (preferably foreign) expert reviewers, this body would be sufficiently broad to judge the quality of the submitted proposals. Moreover, finding 30-35 top scientists is clearly easier than 113, as at present. The mixed composition of the SC would also limit the influence of "cliques". Vacant positions on the SC should continue to be openly advertised, but the minimum required *h*-index of the candidates should be raised to 30. *[We recognise that the h-index is not an absolute measure of scientific prowess; medicine is a broad field and this breadth is reflected in the impact factors of its specialist journals. Thus, although general medical journals (Lancet, JAMA, NEJM) have some of the highest IFs in life sciences, the majority are rather low and this will be reflected in the h-index. However, medical researchers often publish many more papers than their colleagues in the life sciences and thus tend to have h-factors that are rather high. We therefore expect that the Czech Republic will have a sufficient number of clinicians and life scientists with an h-index higher than 30, who might appropriately serve on the AZV SC. (NB: h-indices over 20 might be acceptable in some areas, providing they are based on solid, senior-author publications rather than a high number of minor ones.) In the absence of the very best scientists on these panels, it is clearly difficult to identify the projects with the greatest potential.]* The members should be selected by an independent body of experts (e.g. the RVVI medical research panel or GA ČR)
b. tenure on the SC be limited to 5-6 years
c. the grant review process be made fair and transparent; SC members with conflict of interest must be excluded from reviewing applications of members of their institutions, or of applicants with whom they collaborated or published in the past 3 years or acted as their supervisors/mentors
d. The SC composition should reflect the breadth of the disciplines and include basic researchers with expertise in medically-relevant aspects of life sciences. For example, by including the chair and co-chair of the SC, the chairs and co-chairs of the 10 panels, plus 10 prominent representatives of medically oriented basic research, the 32 SC members ought to be able to make informed decisions about the entire range of disciplines.

2. **Revise funding and evaluation criteria.**
   a. A funding period of 4-5 years is appropriate for novel projects in medical research, but the funding should be increased to permit the support of a research group of minimal critical mass. We recommend the sum of CK 15 mil. for 5 years.
   b. Only a single grant per person should be allowed, unless the additional grant covers a different topic, but still clearly within the area of expertise of the applicant.
   c. The applicants should not be asked to predict how many publications will result from the project and to which journals they will be submitted. The requirement to list other deliverables (patents etc.) should also be dropped.

d. Following pre-evaluation by the AZV administration, which should verify the eligibility of the applicant(s) and the statement of support of the grants office of his/her institute/university, each grant application should be assigned to two members of the SC with appropriate expertise. The responsible SC members should scrutinize the project and the scientific qualifications of the applicant(s), and then assign external reviewers. Funding can be offered based on a min. of three positive external reviews, subject to agreement of the entire SC.
e. At the moment, the projects are subject to excessive scrutiny and control. Progress reports at mid-term and at end of the funding period should replace annual reporting (it is unlikely that a novel, original project will yield important and potentially publishable results within a year) and should be scrutinised by the two responsible SC members only, as well as by the financial officer of the AZV. A change of direction of a project or of distribution of available funds should be possible in agreement with the responsible SC member. Failure to reach goals defined at the onset of the program should not be viewed negatively, providing that the project yielded novel, original results that are of a standard publishable in a peer-review journal. This should substantially reduce the workload of the SC members. The organisation should trust the scientists in the knowledge that they will do their very best to succeed.

3. **Allow extension of existing projects.** Medical and life-science problems are complex and it is unlikely that an unanswered question will be answered within 4-5 years. For this reason, it is important that the research be allowed to continue uninterrupted as long as novel discoveries are being made, or until a solution is found. The AZV statutes should therefore permit extensions of existing grants, providing that satisfactory, well-documented progress has been made in the previous funding period. In the absence of progress, the applicant should receive either reduced- or no funding in the next round.

4. **Revise criteria of eligibility.**
   a. Judging by the titles of the funded projects, the majority use molecular- and cell biology techniques and are thus not in the “applied research” category; only a small number deal with purely clinical questions (e.g. surgical procedures, imaging, patient care). This is a positive sign, given the importance of the above technologies in modern medical and biological research. We recommend that life scientists studying medically relevant phenomena be permitted to apply directly for AZV finding without the need for a clinical collaborator.
   b. Examination of the recent publications of the principal investigators of the 17 funded projects in the first category (metabolic diseases) in the last two calls revealed a lack of first- or last author papers in peer-reviewed international journals. This indicates that AZV funds PIs who are not involved in discovery efforts as originators, but rather as (fringe) collaborators. This practice should be stopped. The main applicant (and grant recipient) should be the PI whose laboratory is going to carry out the lion’s share of the research.

5. **Incentivise clinicians to do research, and institutions to support clinical research.** Clinicians often carry out their research “after hours”, which requires

extreme dedication. Caring for patients is a clear priority and it is understandable that going to the lab after a tiring day at the bedside is not for everyone, especially if there are no incentives for those interested in doing active research. This effort should be rewarded. One way of achieving this goal is to give clinician-scientists (e.g. those who win competitive grants) “protected research time” of at least one day per week. To incentivise medical schools/ clinical departments to actively support clinical research and to compensate them for the loss of bedside time, they should benefit from the funds received from granting agencies such as AZV, for example by receiving part or all of the overheads.

6. **Provide support for MD-PhD candidates.** In many countries, a handful of top medical students are given the opportunity to do an MD-PhD. In Europe, these candidates often complete their medical studies first and then continue as PhD students, which requires additional courses (ECTS points) in addition to full-time research. The AZV should fund ~10 MD-PhD studentships per year. The candidates should be selected on annual basis in an open contest. Given their medical qualifications, they should be remunerated on a higher pay scale than PhD students.

7. **Involve TA ČR in applied projects.** We are aware of the fact that it is not easy to carry out cutting-edge original research in all medical fields. Thus, while disciplines such as gastroenterology, immunology/hematology, cancer research/oncology, endocrinology, dermatology, pharmacology, metabolic diseases and cardiology lend themselves to original, high-quality discovery research, other disciplines may not, but this does not make them less important or relevant to the society. In many cases, applied projects of little apparent intellectual worth yield immediate and lasting benefits to patient care. Projects aiming to directly advance medical technology need to be sponsored. Given that TA ČR specializes in funding applied science, we believe that it could be involved in co-sponsoring clinical projects that include technological aspects such as imaging monitoring, surgical appliance or artificial limb design. This would require that the rules and regulations of TA ČR be relaxed, so as to eliminate the absolute requirement for the participation of industrial partners, which are few and far between in the Czech Republic.

It is clear that there are many other points that need addressing. We must also point out that Covid-19 has prevented us from visiting the Czech Republic and talking directly to research clinicians. The above deliberations are thus based on our understanding of problems in other countries, but not on an intimate knowledge of the situation in the Czech Republic. We would therefore encourage everyone to make suggestions wherever necessary.

14th July 2021