

Outside Evaluation Committee Report

Graduate Program, Biochemistry and Immunology

Institute of Cell Biology

Federal University of Minas Gerais

Overview:

The overall evaluation of the Graduate Program in Biochemistry and Immunology is outstanding. This Program is rated highly by CAPES, and this committee agrees with this assessment. The productivity of the students and faculty is comparable to many well-established international programs, despite significant limitations imposed by space in infrastructural problems. The Program contains a good mix of young, intermediate and experienced investigators, and the energy, enthusiasm, and training of the junior faculty bodes well for the continued success of the program. There are particular research strengths in the areas of neurobiology, protein structure/function, molecular parasitology and immunology, and these areas are appropriately targeted for future expansion. Of the almost 30 faculty reviewed, approximately 1/3 of them ran research programs that are considered to be “high outstanding”, and importantly there are very few faculty (4 or fewer) that could be considered at or below average. From the partial data available the average H-factor of the faculty is 23.8 and the number of citations per publication is 25.1. Some of the research laboratories have chosen to increase the breadth of their research program rather than the depth. The committee recommends that a way to increase the impact of publications is to increase the focus and limit the breadth of the research projects being done in each lab.

The graduate students represent one of the conspicuous strengths of the Program. They are highly motivated and well trained. For many of them, this was their first formal presentation in English and most did an excellent job of describing their scientific accomplishments in the short time allotted. Since 2013 the Program has conferred 90 MSc degrees and 67 PhD degrees.

The CAPES high evaluation of the Program with a score of 7 is certainly warranted and consistent with this Program being one of the top programs in Brazil. However, in the opinion of the committee, some negative aspects regarding the Program may cause it to lose this top rating in the future. Recommendations will be provided that aim to strengthen and increase the standing of the Graduate program at the national and international level.

Space:

Space constraints have reached a critical level. There is simply not enough room to continue to do state-of-the-art research and train new graduate students at the high levels enjoyed in the past. The space constraints are particularly problematic for the talented young faculty that were recently added to the program, but even well-established senior investigators are working in very crowded laboratories. This problem must be addressed. The committee makes the following recommendations. First, the administration should be made aware of the gravity of this situation, and they should be encouraged to renovate the existing space that exists in the Department, or alternatively convert some poorly utilized space into modern functional laboratories. Second, there are currently highly productive faculty occupying very small space footprints, while other less productive faculty have more space. There should be objective, specific and transparent criteria to enable a space reallocation throughout the Department to remedy these inequities and assure that the space is fairly distributed and optimally utilized. Seniority should not be among the criteria used for space allocation. In summary, the committee feels strongly that space needs to be re-allocated and renovated!

New hires:

The Department has added some talented new faculty, who come from prestigious programs and who have eagerly begun to establish their research programs to UFMG. The committee feels that it is very difficult for them to get started as a faculty member in the Department, and this initial difficulty frequently results in a significant delay in productivity. This is an area where the Program can improve. The committee thinks that it will be essential to establish specific initiatives to integrate new Faculty in the Program and to support and encourage new Faculty to excel. Among those, the committee would suggest, first, to formalize a mentoring scheme of new hires with senior faculty to advise in any aspects of starting up independently. Second, the new faculty should get immediate access to graduate students to minimize a lag phase in getting papers and grants. For example a PhD studentship could be included as part of the start-up package of new recruits. Third, some consideration for generating innovative new ways to give new faculty some small “start-up” money to help begin their research programs would facilitate this difficult transition period. Fourth, while this committee understand the space pressures, it is imperative to guarantee new recruits adequate start-up office and lab space. Hosting new recruits in labs from more senior staff is a good idea, but the arrangements should guarantee the new recruit scientific independence. In summary, the committee is impressed with the talented new faculty that have been added to the program and feels that every effort should be made to help them establish independent research programs.

Graduate Student Recruiting:

The faculty are generally pleased with the quality of the graduate students who enter the program and describe them as “committed” and “highly motivated”. The quality of the presentations from the graduate students reflects well on these students. The number of applicants to the Program has remained fairly constant over the years, and the acceptance rate is between 20-40%. Part of the reason for this high acceptance rate is that many of the applicants have been associated with the Program either as undergraduates or MSc students. However, the review committee recommends that additional efforts be made to recruit more applicants to broaden the talent pool of students and decrease the acceptance rate. We feel that this would improve the Program and its national and international standing. Because the majority of graduate students come from the State of Minas Gerais, the Program should pay particular attention to the local recruitment of undergraduate students from nearby universities. The review committee also feels that the Program should expand and improve their “web” presence to facilitate targeting students from other states and countries. This includes improving the web-page to emphasize the many accomplishments of the faculty and the graduate students and the exciting areas of research available. The Program may consider enlisting the assistance of University IT experts to assure that the Program is well-represented in searches in the internet.

Faculty:

The Faculty has diverse scientific interests and has been organized around centres of knowledge, mainly neuroscience, immunology, molecular parasitology and protein structure/function. The committee values the diversity and the breadth of interests. However, consideration should be given to have a minimal critical mass in a particular area to foment collaborations and to support young recruits to establish a successful independent line of research. For future recruitment, the Department in association with the Graduate Program should consider whether there are research areas that are more attractive and exciting to establish in the next 5-10 years. Such areas will provide greater grant income, high impact publications and attract the best students and Faculty members.

The Committee note that out of 33 Faculty, there was advance information available on 21 individual Faculty members. It would have been useful to obtain data from all Faculty and collectively at the Graduate Program level. The Committee is pleased to see the aspect of innovation that is the focus of different labs, with interest in developing patents, biotech companies and other activities. The Committee is also happy with the level of international collaboration and opportunities offered to the labs and students. Such practices should be encouraged and increased.

The publication output of the Faculty from the Graduate Program is heterogeneous. Some groups have higher impact publications (higher number of citations per paper), while other groups have a large number of publications with reduced number of citations. The Committee would recommend encouraging fewer publications with in depth, hypothesis driven data, to improve the knowledge impact rather than incremental additions to previous work. Such strategy will increase the impact of the publication and enable successful grant applications, thereby improving the attractiveness of the Program to other recruits.

Training:

The Graduate Program has implemented established ways to monitor student progression along the 4 year of their PhD, with an initial evaluation of the chosen project, a qualifier examination after 24 months and the final thesis defense. While this structure is appropriate, it will be beneficial to design mechanisms to monitor more often student progress as well as to encourage effective levels of supervision. Such mechanisms will be useful to detect potential problems early on and sort them out. The committee suggest to introduce streamlined practices to monitor more often student and supervisor satisfaction levels and appropriate progress.

The committee commends on the current system where students have a free choice of projects for their PhD. However, to ensure smooth progression through the PhD, some guarantees should be sought that the hosting lab can provide adequate supervision, space and consumables to perform experiments. The graduate program could consider implementing schemes used in other graduate programs. Labs interested in having a student (PhD/Master) submit abstracts of potential projects and information on available support for the student. the Graduate Program prepares a booklet (Virtual) with abstracts for the students to choose from. The current average student/supervisor ratio is 5 and the committee considers this to be an appropriate number. Large deviations from this and much higher student/supervisor ratios should be justified on an individual basis.

Infrastructure:

The Program takes advantage of some outstanding facilities that are available to them, including but not limited to electron microscopy, germ-free animal facilities, and state-of-the-art fluorescence microscopy. These facilities are considered to be crucial to maintaining the high stature of the Program. However, there is a perceived lack of “institutional support” to maintain the day-to-day operations of the research program. This includes simple maintainance issues and routine upgrades of basic facilities. The committee recommends that facilities maintenance and technical support to be increased to assure the good working order of the research laboratories and free the investigators up to do their research. This might involve re-allocating or retraining existing technical staff.

Considering the funding limitations and scare resources, the Graduate Program together with the department could consider implementing communal spaces to share basic equipment (shared usage and maintenance costs) among specific users. This will also enable to make additional lab space, to make equipment available to all faculty and avoid duplication.

Feedback from Graduate Students:

The Students are overall happy with the amount of support and supervision. The main concerns are the amount of resources and equipment available to perform their work. The students find difficult to find equipment and help outside the lab and suggested the use of communal space to host equipment to sharing. The committee thinks that the students should be given more opportunities to present their ongoing work in the Department, rather than once over 4 years of their PhD. There is a general interest among the graduate students in teaching, and small amounts of teaching should perhaps be offered.

It was felt that the students are well integrated in their own laboratory, but the same level of integration among students from other laboratories is not satisfactory. The Program should consider forming a graduate student committee. Perhaps the Program could institute a graduate student e-mail list-serve to communicate and share information. Better communication between graduate students from different labs and “community building” amongst the graduate students would improve their experience and success in the Program.

Summary:

The graduate program in Biochemistry and Immunology can be considered outstanding and comparable to many good international programs regarding the general quality of the faculty members, scientific productivity and the quality of the enrolled students. There are some aspects that require attention to maintain the high level attained so far. One of the most important aspects is related to the infrastructure concerning laboratory space and equipment sharing. Special care should be devoted to keep research programs and publications with higher quality than quantitation, which allows better training and personnel improvement.

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