August 18, 2021

TO: Micheal S. Bruno, Provost
Laura E. Lyons, Interim Vice Provost for Academic Excellence
Julienne Maeda, Acting Dean of Graduate Division

FROM: Jerris Hedges, Dean of JABSOM
Mariana Gerschenson, Associate Dean for Research at JABSOM

SUBJECT: The John A. Burns School of Medicine (JABSOM) Mid-Cycle Graduate Program Report

Enclosed is our Mid-Cycle Graduate Program Report. The report has updated on enrollment trends and outcomes. There are also individualized reports from each of our Graduate Programs.
The John A. Burns School of Medicine (JABSOM) Mid-Cycle Graduate Program Report

JABSOM has five graduate programs: Cell and Molecular Biology (CMB), Clinical and Translational Research (CTR), Communication Science and Disorders (CSD), Developmental and Reproductive Biology (DRB), and Tropical Medicine (TM). The programs are all described online at https://jabsom.hawaii.edu/ed-programs/masters-phd/. The Master of Science (M.S.) in Communication Sciences and Disorders education program in speech-language pathology at the University of Hawai‘i at Mānoa is accredited by the Council on Academic Accreditation in Audiology and Speech-Language Pathology of the American Speech-Language-Hearing Association, 2200 Research Boulevard, #310, Rockville, MD 20850, 800-498-2071 or 301-296-5700. Thus, this program will be described regarding enrollment trends and outcomes only.

The enrollment trends for JABSOM graduate programs are described below. The data were obtained from UH MIRO in November, 2020. Enrollment has increased in the past two years in CMB MS, CTR MS, DRB MS, and TM MS. Enrollment has declined in CTR Ph.D. with the planned closing of this program scheduled for August, 2022. Enrollment has remained stable in all the other graduate programs.

<table>
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<th>Program</th>
<th>Dup. Total¹</th>
<th>Average</th>
<th>AY 2015-16</th>
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¹ Total number of enrollments (duplicated) over the range of years shown. This number is used to calculate the Average.
The outcomes for JABSOM degree programs in MS and Ph.D. as obtained from UH MIRO are described below for FY2017-2020. JABSOM has the following small programs: CTR MS, CTR Ph.D., DRB MS, DRB Ph.D., and CMB MS per UH Manoa in FY 2020. This is defined as 3 or fewer graduates in a five-year average (2015-2020, data not shown).

**Small Program Justification**

**CTR Program:**
The CTR MS program was revamped in 2017, effective from Fall 2018. Enrollment has grown over years: 4 in 2018, 5 in 2019, and 7 in 2020. The Graduate Certificate Program in Clinical Research was recently approved and is effective Fall 2021. With improved recruitment effort, synergy/leverage in recruitment with the recently approved Graduate Certificate Program, recruitment video ([https://www.youtube.com/watch?v=JdWmkbul1YU](https://www.youtube.com/watch?v=JdWmkbul1YU)), and new leadership (effective Jan. 1, 2021, Dr. Eunjung Lim is the new Graduate Chair), we anticipate increased enrollment and graduation.

**DRB Program:**
The DRB program is a specialty program and fills an important niche nationwide. It offers a highly specialized curriculum in the field of reproduction and development. The program bridges basic science and clinical applications and prepares students for careers in academia, medical field and biotech and other industry. This includes students who apply to medical school. The DRB student body is multicultural and multiethnic, with 35% student being ethnic minorities and first in the family to pursue graduate studies, and thus provides a unique
and nurturing environment for education of disadvantaged learners from our Hawaii community.

The Institute for Biogenesis and the Department of Obstetrics and Gynecology faculty now collaborate in this endeavor. DRB has recruited students from the UROP program to become graduate students. DRB advertises in the journal Science and at scientific meetings. The DRB supports students financially by different mechanisms, including: five TA positions from the Department of Anatomy, Biochemistry and Physiology (ABP), two IBR/AVS positions sponsored by the Institute of Biogenesis Research (IBR), one Kosasa Assistantship GA position sponsored via relationship with the Department of Obstetrics and Gynecology (Ob-Gyn), and traditional RA positions sponsored by grants of graduate faculty.

**CMB Graduate Program:**

The program serves as a conduit for 3 main avenues: 1. It provides additional training for individuals interested in medicine; 2. It provides technical training for the Hawaii research and clinical based work force; and 3. It is an entry point for our CMB PhD program. Dr. Michelle Tallquist became program chair in 2017 and has been steadily increasing the numbers with five-year averages increasing from 2.4 to 2.6. We have also accepted more students into the program in the past 4 years. Finally, one positive aspect is that one reason that CMB does not have graduates at the Master’s level is because they are promoted to the PhD program without obtaining their Masters.

CMB has initiated talks with MCB undergraduate program in CNS to form a BAM program which will increase the number of Master’s students. CMB has also increased admissions into the program since 2017. CMB is increasing admissions to this program at the same rate as faculty research demands. CMB is also encouraging students to complete their Master’s before moving to PhD status if this is the path they choose.

**Graduate Program Websites:**

All JABSOM graduate program web sites are current:

CMB: [https://cmbgrad.jabsom.hawaii.edu](https://cmbgrad.jabsom.hawaii.edu)
CTR: [https://qhs.jabsom.hawaii.edu/education/clinical-and-translational-research-graduate-program/](https://qhs.jabsom.hawaii.edu/education/clinical-and-translational-research-graduate-program/)
DRB: [https://jabsom.hawaii.edu/grad_drb/](https://jabsom.hawaii.edu/grad_drb/)
TM: [https://manoa.hawaii.edu/tropicalmedicine/?page_id=240](https://manoa.hawaii.edu/tropicalmedicine/?page_id=240)

JABSOM and the graduate programs use social media: Facebook and Instagram

JABSOM is working to increase graduate student recruitment by participating in UROP, providing enticing web-based videos, participating in Pre-Health Orientation at UH Manoa (09/02/2021), and by advertising in the journal Science.

Several programs also offer one-year certificates that introduce potential applicants to their field and have led to enrollment in the MS program upon certificate program completion.
JABSOM Graduate Program Updates (from Graduate Chairs)

Cell and Molecular Biology (CMB):

Current participants
3 MS students
15 PhD students
56 Faculty

Degrees granted 2018-2019
5 PhD students
2 MS students

Degrees granted 2019-2020
3 PhD students (multiple students deferred due to Covid 19)
3 MS students (two were summer 2020)

Qualifying exam
4 PhD, 1 MS
All passed written
1 failed first attempt at oral

Left program
1 MS student left due to financial hardship
1 PhD student left to go to MBBE after failing oral qualifying exam
1 PhD student left with MS

Admissions
31 applications (17 PhD) and 14 MS) (up 30% from last year)
Extended 8 offers for PhD 3 accepted (GPA was 3.40 and 3.25, respectively) (3 mainland)
Extended 12 offers for MS 6 accepted and two deferred. (GPA 3.37 and 3.25, respectively) 5 local/1 mainland

Achievements
Brien Haun received an ARCS award.

Recruitment and admissions efforts

Current
Update website information regarding application process.
Developed Facebook page, but it is not extremely active. Try to announce seminars and papers by students, but I do not do this regularly.
Discussed need for updated webpage with CMB chair, and he agreed.
Visited Hilo career fair for recruitment purposes.
Have encouraged faculty to advertise both T32 slots and CMB graduate program at national and international meetings (provided with program flyers).
Appointed new admissions chair.
Assigned members of admissions committee to individually contact top PhD candidates.
Moved all applications to e submissions to avoid issues such as lost recommendation letters and personal statements.
Attended SACNAS meeting and promoted graduate program
Correct incorrect links and contact addresses

Provided updates to applicants
  - acknowledged receipt of application
  - encouraged complete submissions (only two applications were missing 1-2 items this round) This is a major improvement compared to past years.
  - explained any additional concerns due to Covid-19

Future
Generate better flyers and website.
Advertise students’ successes.
Encourage further advertising at meetings.
Identify further relevant meetings to promote program.
Encourage outreach to local high schools
Coordination with graduate certificate program spear headed by Alex Stokes

Administration clarity
Current
Initiated rotation evaluation forms
Initiated rotation agreement forms
Require IDP for grant writing course and/or qualifying exam participation
Send IDP request annually
Require modified Stanford IDP which is detailed and specific

Future
Reach out to faculty mentors to determine realistic progress

Curriculum
Current
2 curriculum committee meetings
  - Discussed increasing writing requirements, but no conclusions made
  - Discussed changes in CMB621 and 622 to encourage critical thought, experimental design and scientific rigor, no conclusions made
  - Continued discussions for cancer biology course
CMB611 now more lenient with regards to substitute classes and move to credit/no credit
Loss of biostats class but Trop Med class highly recommended
No longer a distinction of passing the qual exam as a master’s student vs PhD
Establish connections with other departmental seminars to permit student access to a variety of seminars

Future
Continue discussion of changing format of CMB621 and 622 to be more scientifically rigorous
Consider making master’s a step towards PhD.

Career Development
Current
Emphasize use of IDP to specialize training
Held several lunches to permit students to interact with different stage investigators (on job search for industry and academia)
Hosted several speakers from SACNAS to develop elevator talks and career alternatives
Advertise career development seminars through other programs
Sent articles regarding planning for careers in science
Grant writing class includes elevator talk practice and both long and short presentations

Future
Hold junior investigator symposium Dec 2020 to provide information
Establish alumni network to encourage networking for career options
Provide more opportunities to present work and describe accomplishments
Hold one to one meetings to discuss options and goals for the future

Campus coordination
Current
Contacted School of Life Sciences Chair (Dec 2019) for opportunities for CMB faculty guest seminars in undergraduate classes, but they deferred to later.

Future
Establish stronger ties with School of Life Sciences. Have been in contact with Stefanie Kraft-Terry to look for future collaborative efforts.
I would be very interested in participating in a committee to foster coordination and collaboration across campus for biomedical sciences

Clinical and Translational Research (CTR) Program:
Currently participants:
16 MS students
2 Ph D students
10 Regular graduate faculty

Degrees granted 2018-2019:
1 MS student
1 PhD student
Degree granted 2019-2020:
3 MS students

Recruitment and admission efforts:
Created MS and graduate certificate fliers and distributed them to UH undergraduate programs including STEM and engineering schools, UH Honor’s Program, and UH undergraduate research center; contacted UH Pre-Health Advising Center, Center on Disability Studies, School of Nursing and Dental Hygiene, College of Education, and Departments of Mathematics and Psychology; contacted Hawaii Association of Science Teachers, Hawaii Teachers in the Department of Education, and The Queen’s Medical Center; attended UH graduate school fair.

Program Description:
The Department of Quantitative Health Sciences (DQHS) offers the Master of Science in Clinical and Translation Research (MSCTR) graduate program. The MSCTR program (https://qhs.jabsom.hawaii.edu/wp-content/uploads/sites/31/2020/12/2020-12-01-MSCTR-Grad-Prog-Brochure-optimized-for-web.pdf) prepares graduates with skills for successful careers in clinical and translational research and research support. It is currently offered with two tracks, Clinical Research (CR) and Quantitative Health Sciences (QHS); both available in either Plan A (thesis) or Plan B (capstone project).

The CR track focuses on the study of methods suitable to investigate clinical research topics. The competency domains include clinical and translational research, quantitative health skill, professionalism, communication, and interdisciplinary collaboration. Students will learn about the conduction of clinical trials involving humans in accordance with the International Conference on Harmonization Guideline for Good Clinical Practice E6(R2) (ICH/GCP) and the United States Code of Federal Regulations (CFR); and will develop the ability to apply ethical principles that guide clinical research and ensure the safeguarding of humans. Students will become familiar with and understand the purpose and operations of Institutional Review Boards (IRBs) and relevant organizational requirements. In addition, students will develop and/or increase their grant application skills to obtain research funding from agencies such as the National Institute of Health (NIH) and others. Potential future careers include physician researcher, clinical research coordinator, clinical project manager, clinical trial monitor, and regulatory associates.

The QHS track contributes to a field that requires specific analytic skills and is one that is currently lacking sufficient numbers of experts. Students enrolled in the QHS track will learn research design and advanced data analysis skills and tools, including large data analytic
approaches for health science research. They will master the scientific principles and methodologies that underlie basic science and clinical and translational research methods. The QHS track will prepare them for future careers in areas such as biostatistics, bioinformatics, data science, analysis of healthcare data, biomedical informatics, and clinical outcomes analysis, to name a few.

In addition to offering knowledge and skills needed for careers in clinical and translational research, the program functions as a supportive mechanism for newly trained investigators, actively facilitating career development and encouraging research collaborations, particularly those related to health disparities research. By providing high-quality training, the program aims to increase the critical mass of clinical and translational research at UHM, including its minority investigators. Prospective students include junior faculty, fellows, residents, and other students from health sciences, natural sciences and physical sciences. The interdisciplinary nature of the program broadens students’ perspectives and increases opportunities for innovative, cross-disciplinary collaborations in clinical and translational research. Graduates of the program pursue research and research support careers in academia, government laboratories, healthcare organizations, and pharmaceutical companies.

Beginning Fall 2021, the DQHS will offer a Graduate Certificate in Clinical Research (GCERT-CR) (https://qhs.jabsom.hawaii.edu/wp-content/uploads/sites/31/2021/05/MSCTR-Cert-Flyer-04302021v3.pdf). The GCERT-CR is ideal for gap-year students, medical trainees, physicians, nurses, allied health professionals, and other health professionals with an interest in developing their skills for collaborative research. Students will gain knowledge of clinical research and trial design, clinical research protocol development, ethical conduct of clinical research, and the skill of statistical data analysis.

GCERT-CR students will be able to complete the required courses at their own pace if enrolled part-time or within 2 semesters if enrolled full-time. The GCERT-CR enrolls for the Fall semester only. Through the UHM Outreach College, students have the flexibility to take individual courses without enrolling into a graduate degree program right away.

Future Plans:
Conduct a student survey and evaluate the effectiveness of program revision
Develop promotional video(s)

Developmental and Reproductive Biology (DRB) Program:
Currently in the program:
18 students (11 PhD + 7 MS) + 3 admitted PhD that deferred.
Support
All students supported by GA: 5 TA positions within department (4 in Physiology and 1 MD2/3 Anatomy) 3-4 TA positions with Biology, 2 IBR-AVS Gas, 1 Kosasa GA, and RAs

Graduation:
Fall 2019: 1 PhD, 1 MS-B
Summer 2020: 1 MS-A, 1 MS-B
Fall 2020: 1 MS-A, 1 MS-B

Left program:
1 PhD student graduated with MS-B summer 20 and was admitted to PhD program in Trop Med

Recruitment
Website, conferences, UH career fairs, word-of-mouth

Admissions
Spring 2020: 1 PhD, 1 MS
Fall 2020: 7 applied (4 PhD, 3 MS), 5 accepted (3 PhD, 2 MS); PhDs are all international (China, India and Spain), 4 coming (3 PhD, 2 MS), and 3 Ph.D. deferred.

Achievements
Aileen Li received ARCS award
Brent Fujimoto received Windsor and Mary Cutting Award

Recruitment and admissions efforts:
Not very active now as situation is unclear with COVID-19. Will reinstate efforts once things go back to normal. Efforts will include advertisement at scientific conferences, via scientific societies, via word of mouth, via participation in science fairs, attending relevant meetings (SACNAV), etc. Flyer is available. Website is active and updated frequently as needed (managed by a DRB graduate faculty volunteer).

Administration
Satisfactory. No changes are needed. The program is self-administered via effort of the chair, admission committee, and graduate faculty volunteers.

Curriculum
Satisfactory. No changes are needed at present.

Career Development
Performed primarily by mentor and chair consultation. IBR seminars, invited speakers’ presentations and guest lectures serve as a platform for students to be exposed to different stage investigators and investigators from different institutions. PhD students are advised to take a
grant writing course. The IBR-COBRE External Advisory Committee is available to meet with DRB students during their annual visit.

**DRB Program Overview and Strengths**

**The DRB program is self-administered.** The DRB program is a small program by choice, not by lack of students’ interest. We maintain the recruitment and admission at the level compatible with our ability to support students and our ability to manage the program without administrative help. There was nobody ever hired to administer this program, either faculty or administrative personnel. The recruitment and all administrative steps are efficiently managed by the DRB chair, with help of the DRB admission committee. Our current students, as well as applying candidates, obtain personalized care. They receive timely responses to their inquiries, they are individually guided through the admission process, and they are well taken care about through their tenure in the program. Because we are small, we can afford being self-sustainable and self-administered, and it works well.

**The DRB program supports its students financially through different mechanisms.** The DRB program has been active in its attempts to secure funding for its students using various resources. The IBR, with which the DRB program is affiliated, funds two Graduate Assistantship (GA) positions, called the IBR/AVS GAs, using the NIH IBR COBRE grant. Two graduate students hired as these GAs work in the IBR vivarium to support services provided by UH LAS. So, the DRB students and the sponsoring IBR support the UHM services. The DRB program has recently attracted financial support for another GA position: *The Kosasa Graduate Student Assistantship*. This assistantship is funded by Dr. Thomas Kosasa, a Director of the Pacific IVF and a Professor Emeritus in the Department of Obstetrics and Gynecology (Ob-Gyn) at JABSOM. The Kosasa Assistantship provides funds, annually, for one GA awarded to a graduate student in the DRB graduate program. The Kosasa Assistantships enables the awarded student to be hired as a Research Assistant (RA) and pursue MS or PhD research project in the laboratory of a DRB Graduate Faculty. The ABP Department also offers 5 ABP Teaching Assistant (TA) positions to the DRB students. These students support teaching mission of JABSOM in undergraduate teaching in Physiology and graduate teaching in Anatomy. Some of the DRB students are also supported by the Biology TAs positions coming from the Department of Biology UHM, and the remainder of DRB student are grant funded RAs. All current DRB students are funded and secure in their respective GA positions.

**The DRB program fills an important niche nationwide.** The DRB program is small but highly specialized and unique nationwide. We have been repeatedly told by incoming mainland students that there are few, if any, graduate program specializing in reproduction and development. Indeed, several students commented that when they searched the web for a program with a focus on reproduction and development, they were finding only programs in which these topics were merged with cell biology, or molecular biology, or both. When they reviewed the curriculum of these programs, they were finding the reproductive and developmental component largely diluted and few graduate faculties with relevant expertise and research interests. The DRB Program at JABSOM offers both the specialized curriculum and the broad body of faculty pursuing active research in reproduction and development. The DRB program curriculum is composed of mandatory courses, that collectively represent 78% of
didactic course credits required for a graduation. All of the mandatory courses except for Ethics are specialty courses exploring various aspects of reproduction and development. The remaining 22% of credits come from electives, among there are several courses relevant to DRB theme, like Embryology and Stem Cell Biology. Thus, the DRB students learn specialized knowledge and skill set while in the program, and this is one of the features that makes this program attractive to oncoming students. The DRB as a specific program, associated with the IBR and Ob/Gyn forms a triad that merges graduate students, both PhD and MS students interested in medicine, with basic scientists in the IBR and clinical scientists in Ob/Gyn.

The DRB program is multicultural and multiethnic. The DRB program student body is highly diverse. Among the 17 students currently in the program (not counting 3 that are admitted for Spring 2021) we have 6 (35%) ethnic minorities, 1 (6%) first in the family to graduate from high school, 1 (6%) first in the family to graduate from college, and 4 (24%) first in the family to pursue graduate studies. All but one “first in the family” students are local students. Thus, the DRB program provides unique and nurturing environment to advance their education for young and underprivileged in our Hawaii community and fits well with UHM and JABSOM mission in this regard.

The DRB program bridges basic science and clinical applications. The faculty from the IBR and the ABP Department pursue clinically relevant research and many of the DRB students carry out clinically relevant projects. The IBR has close ties with the Department of Obstetrics and Gynecology. The Kosasa Assistantship was created to strengthen a bridge between the IBR, with which the DRB program is associated, and the Ob-Gyn and Pacific IVF. The assistantship is expected to foster high-quality reproductive research and mingling of basic and clinical research activities. The IBR Director, Steve Ward, is also a Chief of Research Division and Lakshmi Devi and Devraj Sharma Endowed Chair in Ob-Gyn. The DRB students are involved in many basic science – clinical collaborations, including research on placenta, oogenesis, fertilization, cardiovascular, and other. The DRB graduate program is intimately associated with the NIH funded IBR-COBRE, a multi-million dollars grant over 16 years still being funded. The DRB Program was started because of the funding of this grant in 2008 and is tied to this grant. Over the past 5 years, the IBR have developed a strong collaboration with the one clinical department that aligns most with its research focus, the Ob-Gyn. This long-nurtured collaboration positioned the IBR to quickly respond to an RFA from the NIH for a $200,000 grant that focused on women’s health during pregnancy and infant mortality. The DRB students are involved in execution of this grant.

The DRB Program prepares students for Medical School admission. The DRB students are offered many opportunities that prepare them for medical school admission. Among the ABP TA positions four are in an undergraduate level Physiology and one is in a graduate level Anatomy. Teaching contributions to these classes increase preparation and competitiveness for medical school admission. The translational research activities carried out by our students serve similar purpose. Some of our alumni choose medical school as a career path and several have already progressed to become resident physicians. The DRB program not only prepares students for medical school but also these students are beginning to contribute to the education of future physicians. One of the early DRB students is now a practicing physician.
named Dr. Aileen Tamu, MD, and is now serving as MD2 PBL instructor. The DRB program is bearing good fruits in our community and school.

The DRB Program offers MS and PhD paths which are independent but linked. The DRB currently accepts students to both MS and PhD paths. The students in both paths share the curriculum and the basic course load. The PhD students, however, take advanced courses later during their tenure in the program, selecting courses that are best matched to their dissertation topic. Currently in the program we have 10 PhD student and 7 MS students. The 3 students admitted for Spring 2021 are PhD students. Please note that it is common in our program for students admitted to the MS program and intending to earn just the MS degree, to elect to transfer to PhD program. Among the 10 PhD students currently in the program, 5 entered DRB with intention to earn MS only, and changed their mind later. Please note also that many local students, and especially those from “first in the family to pursue graduate studies” group, are not brave enough to apply to a PhD program at the start of their graduate studies. Applying to the MS program seems more achievable to them, and it is only after they grow to see what the graduate work entails, what they have already done, and that they are capable of doing more, they decide to continue towards PhD.

Tropical Medicine (TM) Graduate Program:

This report summarizes the actions taken by the Tropical Medicine Graduate Program to respond to comments of the external reviewers in the JABSOM Graduate Program Review in May 2016. It is organized according to the comments of the reviewers directed to the Tropical Medicine Graduate Program.

1. Curriculum & student support

   Recommendation: Students need seminar/workshop exposure to non-academic careers (biotech, government agencies, WHO, pharma, policy).

   The department has incorporated career development seminars into their TRMD 690 seminar course, which is attended by all Tropical Medicine graduate students and faculty and has invited guest speakers to meet with students to discuss their career paths. These seminars are broadly advertised within the medical school to allow students from all JABSOM graduate programs to attend and participate. Careers featured by these invited speakers thus far have included patent law, pharmaceutical research and development, infectious disease epidemiology, public health laboratory science, science communication, and grant administration for federal agencies such as the National Institutes of Health.

   Recommendation: Advance the development and adoption of topical (tropical medicine related) topics within or in concert with the Responsible Conduct of Research (RCR) course currently available.
As part of the core curriculum, Tropical Medicine Department graduate students must complete a 2-credit course focused on Responsible Conduct of Research (RCR) and research ethics offered by the JABSOM Cell Molecular Biology Graduate program. Further, Tropical Medicine Department is planning to hold additional seminars to improve the understanding of our students in the RCR topics relevant to tropical medicine. We also encourage students to participate in online short-courses or webinars specially targeted for RCR-related issues for infectious disease research organized by other organizations like NIH or Johns Hopkins University. We will invite Trop Med faculty or their collaborators outside UH who are involved in clinical or vaccine research to give seminars on relevant RCR and ethics in translational research topics. For example, infectious disease clinical faculty from our department will be invited to discuss the social and ethical issues important for consideration while working with HIV patients. Similarly, relevant experts will be invited to talk about ethical issues associated with vaccine trials or infectious disease diagnostic studies. In addition, students who are interested in field research are encouraged to refer to WHO manuals on guidelines for managing ethical issues in infectious disease outbreaks (https://apps.who.int/iris/handle/10665/250580).

**Recommendation:** While the program indicated the IDP is required, the students seemed unaware; thus all students should develop an IDP with their mentors and committee as a way to pre-plan needs for their professional development and open up avenues for career exploration.

The Tropical Medicine Graduate Program has implemented an online Individual Development Plan (IDP) utilizing the REDCap secure web application for managing online surveys and databases. This IDP considers both short-term and long-term career goals. MS and PhD students are asked to complete and update the online IDP survey annually which includes a timeline covering various aspects of their training. The student reviews their IDP and timeline with their mentor, who then signs off on the IDP. The student then schedules a meeting with the Graduate Chair and Associate Graduate Chair to discuss their IDP, timeline and overall progress. Any issues that arise from this discussion are followed up by the mentor, graduate chair, or department chair as appropriate. Preparation of the IDP and meetings with the graduate program leadership are usually carried out during the summer months.

**Recommendation:** Implement an exit survey of all students to gauge program quality and adopt change based on results (and communicate what has changed).

The Tropical Medicine Graduate Program distributes an online exit survey to all graduating MS and PhD students. The anonymous exit survey is conducted biennially and responses are compiled by the graduate chair and utilized for curriculum evaluation and program review.

**Recommendation:** Additional effort to engage foreign governments and private funders to support research, to complement existing COBRE-funded efforts, could lead to expansions in
both faculty and student opportunity and support, though the unit must maintain a principle focus on the quality of the education and research offered to its students.

The department has been engaged in training partnerships with several international educational and research institutions in Cameroon, Liberia, Thailand, India and the Pacific Island region. These partnerships have been supported by training grants from the NIH Fogarty International Center, the National Institute on Minority Health and Health Disparities, and the Centers for Disease Control and Prevention. Tropical Medicine international students have also received partial support during their training from their home countries. The department also has several University of Hawaii Foundation accounts for endowments that provide scholarships, research and travel funding, or graduate assistantships for its students:

- Joseph E. Alicata Award in Tropical Medicine & Infectious Disease
- Virginia Hinshaw Biomedical Research Scholarship
- Yoshitsugi Hokama Fund
- The Abraham Kagan, MD Endowed Fellowship
- Wallace-Taylor Endowment

Donations to support the department’s research and training activities are solicited through a “DONATE” link on the department’s website homepage. This link takes the reader to a list of department endowments and UH Foundation accounts and a “Donate Now” links them to the UH Foundation online donation site.

Recommendation: TM needs to continue a strong effort at the faculty level to augment P20 funding with additional R-awards, especially to offer additional opportunities for students (i.e. USAID, NSF). TM also needs to invest energy in the acquisition of international private/NGO funding (i.e. WHO, Gates) for research as well as individual student fellowships (Fulbright, Gates, WHO).

Department faculty have been successful in obtaining significant funding from the National Institutes of Health and other funding agencies to support our research and educational activities. Efforts are continuing to increase research funding by department faculty. A summary of total award amounts and numbers of research and training grants received by department faculty for the last five years are shown below. While there was a decrease in grant funding in 2019 as compared to previous years, the level of 2020 funding has substantially increased, particularly notable since the 2020 awards do not cover the entire calendar year. This increased level of funding has allowed us to recruit more students into our graduate program and maintain funding for current graduate students. The department continues to provide important resources for graduate student international infectious disease research through its various NIH- and CDC-sponsored training grants.
2. Program size.

Recommendation: Efforts to expand research-funding sources will allow the program to attract more high-quality students. However, new programs, such as the certificate program, also will attract more students. Given the sharing of curriculum and other resources across programs, for purposes of the UHM small program evaluation, the TM MS and PhD programs should be treated as a single program.

There has been a steady increase in Tropical Medicine Graduate Program enrollment since the introduction of the GCERT program in the 2016-17 academic year. The GCERT program has proven to be an important recruitment tool for the Tropical Medicine MS program. To date, four GCERT students (31%) have matriculated to the MS program and two of these have successfully completed the MS degree while the other two are continuing in the program. An added benefit of the GCERT program is that we have had the opportunity to identify candidates who were originally not judged to be competitive for acceptance into

<table>
<thead>
<tr>
<th>Calendar Year</th>
<th>No. Research Grants</th>
<th>No. Training Grants</th>
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<tbody>
<tr>
<td>2016</td>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td>2017</td>
<td>26</td>
<td>4</td>
</tr>
<tr>
<td>2018</td>
<td>29</td>
<td>3</td>
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<tr>
<td>2019</td>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td>2020*</td>
<td>15</td>
<td>4</td>
</tr>
</tbody>
</table>

*Partial year funding through October, 2020
the MS program but who demonstrated, through their performance in the GCERT program, their ability to succeed in graduate level coursework and research. As further indications of the success of the GCERT program, five GCERT graduates subsequently have been accepted into the JABSOM and University of Oklahoma MD programs and one student was accepted into the JABSOM Imi Ho’ola program. One GCERT student was accepted into the MS program at the University of Minnesota and another was accepted into the University of Washington Nursing Doctorate program. In summary, the GCERT program has been instrumental in providing advanced degree opportunities to its graduates both in Tropical Medicine and other academic pathways.

A summary of research funding obtained in the past five years was provided in the previous section. The department has also received 3-4 large training grants annually to provide support for both US and international graduate students. These include training grants that are specifically targeted to support the training of minorities underrepresented in graduate education, including Native Hawaiians and Pacific Islanders.

3. New Programs

**Recommendation:** Investigate innovative ways to deliver tropical medicine training to a wider audience. Potential options include hybrid MS and certificate programs with online components combined with intensive, short-term on-campus classes, and a series of short (1 to 3 weeks), noncredit training programs that can stand alone or lead to noncredit certificates.

The Department of Tropical Medicine, Medical Microbiology and Pharmacology is currently spearheading the creation of a new One Health Interdisciplinary Undergraduate Certificate program as an innovative approach to increase awareness of the Tropical Medicine program among undergraduate students and recruit these students into our graduate program. This undergraduate One Health certificate program represents a partnership between faculty based in several UH Manoa departments and colleges:

- Dept. of Tropical Medicine, Medical Microbiology & Pharmacology, John A Burns School of Medicine
- Office of Public Health Studies, Myron B Thompson School of Social Work,
- Pacific Bioscience Research Center, School of Ocean and Earth Science and Technology
- Dept of Human Nutrition, Food and Animal Sciences and Dept. of Plant and Environmental Protection Sciences, College of Tropical Agriculture and Human Resources

The One Health Interdisciplinary Undergraduate Certificate Program initiative was selected as a winner of the UHM Provost’s 2019-20 Strategic Investment Competition for High-Impact Practices in Undergraduate Education. The goals of the undergraduate certificate program are (1) to prepare students with the knowledge and skills to work across disciplines
to collaboratively solve real-world problems and address complex health and social challenges, and (2) to identify and recruit students into One Health career paths, including Tropical Medicine-related careers.

In addition to submitting the Authorization to Plan documents for this new undergraduate certificate program, we have also developed a novel 300-level, online undergraduate course entitled “Pandemic Preparedness and Response: One Health Case Study of COVID-19” which was recently approved by UH Manoa. This course encompasses the medical, sociological, public health, political, environmental and technological aspects of the COVID-19 pandemic and uses it as an example of a multi-faceted global health problem that should be approached from a One Health perspective. While designed to be a key component of the One Health certificate curriculum, this course is open to all undergraduate students interested in learning about the One Health approach to the COVID-19 pandemic. This course also will be an important recruitment tool for our Tropical Medicine graduate programs.

In summary, the faculty of the Tropical Medicine Graduate Program has attempted to address all of the comments of the external reviewers who conducted a review of the Tropical Medicine Graduate Program in 2016. We were encouraged to receive their overall assessment that this is “a high-quality, unique, and valuable program within the UHM graduate education offerings” and we will continue to strive to enhance the program to meet today’s challenges and to prepare our students for tomorrow’s opportunities in global health.