



## Dean's Executive Summary

PhD in Pharmaceutical Sciences Program Review  
July 2, 2021

### I. Overview

#### Mission, Vision, Goals

University of Hawaii is a land-grant institution with a responsibility to provide educational capital and workforce that prioritizes the needs of the state. The University of Hawaii at Hilo (UHH) is one of three four-year campuses of the 10 campus University of Hawaii System.

The vision of the Daniel K. Inouye College of Pharmacy (DKICP) at the UHH is to drive improvement of healthcare in Hawaii and throughout the Pacific.

We achieve this vision by focusing on Hawaii's unique cultural, physical, and geographic features, by employing world-class faculty, and by graduating exceptional professionals.

Our tripartite mission is to 1) Educate Pharmacy Practitioners and Leaders, 2) Serve as a Catalyst for Innovations and Discoveries in Pharmaceutical Science and Practice for the Promotion of Health and Wellbeing, and 3) Deliver Quality Patient Care.

Founded in 2006, the inaugural class of 2011 was accepted into the flagship Doctor of Pharmacy (PharmD) degree program in 2007. The PharmD degree gained the first full accreditation in 2011 from the Accreditation Council of Pharmacy Education (ACPE). The UH Board of Regents granted this degree permanent/established status in April 2014. A second full ACPE accreditation was granted in 2017 for the full eight-year term until 2025.

The Doctor of Philosophy (PhD) program began in 2011 and the first program review will occur in August 2021. In addition, UHH will have a full WASC accreditation visit in October 2021 in which this review will be included. The PhD Pharmaceutical Science degree is the highest science degree offered at the UH Hilo with the first graduates of the program in 2016.

Our mission is predicated on four over-arching goals:

1. Implement academic curricula that lead to a flagship Pharm.D. program, which produces graduates committed to serving people via science-based practice.
2. Accountability to the Institute of Medicine's core competencies for the health professional workforce.

3. Conduct research that advances pharmaceutical sciences and makes a difference for humanity inclusive of effects on global health.
4. Cultivate culturally competent, intellectually inquisitive, self-directed, caring pharmacists, who are critical thinkers, problem solvers and life-long learners in a changing healthcare environment.

**UHH Campus Priorities and General Budgetary Information**

As a state University, campuses are funded through the state’s general funds, supplemented by extramural grant funding, private and public development and philanthropic donations.

The UH Hilo has an enrollment of approximately 3000 students in undergraduate and graduate degrees housed within five colleges that includes the College of Natural and Health Sciences (CNHS), College of Business and Economics (COBE), College of Forestry, Agriculture and Resource Management(CAFNRM), College of Arts and Sciences(CAS) and the Daniel K. Inouye College of Pharmacy. Although not the designated R01 research campus of the UH System, UH Hilo does contain grant funded research labs and maintains their research program through the support from the Research Consortium of UH (RCUH), and a faculty led UHH graduate research committee.

**Organization of the DKICP**

The DKICP home base is located in Hilo on the island of Hawai’i with a satellite offices and classrooms on Oahu and one full time faculty on Kauai. Five departments comprise the college and include the 1) Dean’s Office; 2) Student and Academic Affairs; 3) Research Office; 4) Dept. of Pharmaceutical Sciences and 5) Dept. of Pharmacy Practice.

The following table describes the current faculty and staffing quantities for the DKICP degree programs.

**Table 1. Faculty and Non-Academic Staffing**

	<b>Dean’s Office</b>	<b>Research</b>	<b>Student/Academic Affairs/IT</b>	<b>Dept. Pharmaceutical Sciences</b>	<b>Dept. of Pharmacy Practice</b>
Faculty for PharmD Degree	1			9	14 + 3.5 Instructional hires
Non-Academic Staff	4	1	7	1	2
Faculty for PhD program				9	2

The DKICP faculty maintain strong relationships with various clinical and research programs throughout the state and across the nation. Many of the Pharmaceutical Science (PS) faculty are also affiliate members of the UH Cancer Center and have been partners on extramural grants with the John A. Burns School of Medicine through the INBRE grant since approximately 2010.

The PS faculty are highly regarded in their specialty research areas with more than adequate publication records with contributions to peer-reviewed and high impact factor journals pertinent to Pharmaceutical Sciences. Faculty are invited to local, national and international science conferences. Several have extramural grant funding either as PI, co-PI or as subawards.

Faculty belong to a collective bargaining unit University Hawaii Professional Assembly (UHPA) with faculty governance represented by a DKICP faculty senate as part of the UHH faculty congress.

### **DKICP Business Model and Funding**

The DKICP operations is essentially funded through tuition revenues (90%) with the remaining 10% funding through state general funds. The college pays for all utilities in their facilities, bond debts on two buildings, the modular buildings which served as the didactic education base from 2009 – 2019 and the newly built Hale Kioh'ioh'i permanent building recently completed in late 2019. Since the founding of the college in 2006, there has been a near doubling of pharmacy schools across the U.S. thus leading to a fierce competition for PharmD student applicants. Coupled with a saturated job market, this dual challenge paves a difficult path to maintain or increase PharmD candidates recruitment.

Over the last two academic years, the DKICP has had a 50% decrease in the entering PharmD cohort. This decline has mandated ongoing budget restrictions leading to substantial reductions in all operational costs. In addition, given the COVID-19 pandemic's economic impact, especially upon the state's tourism industry and collected tax revenues, budget impacts will be felt on all campuses of the UH System for the next few years.

### **PhD Pharmaceutical Sciences Degree Specifics and Progression of Degree Status**

The PhD degree is classified by the UH as a small degree program in that the program graduates less than 10 students per year. To date, the program has graduated nine (9) students with nine(9) student currently enrolled in various stages of completion.

Faculty have been hired mainly for instruction in the PharmD program. However, some faculty also teach in the PhD program (Table 1). The program is headed by a Director of PhD program who in this capacity reports directly to the Dean but who also serves as a full-time faculty member in the Dept. of Pharmaceutical Sciences.

As of June 1 , 2021, the program has graduated nine students and all have placed in appropriate and respected academic, industry, medical or post-doctoral positions. The average time to

graduation appears to fall within acceptable standards, however, a list of graduation dates respective to each graduate would help to support this information and not necessarily assumed from the table that lists dissertation topics.

The seven actively enrolled students are in different stages of their training with continued commitment from the PS faculty for training till final dissertation presentation and degree conferral. The external review committee may find interest a list of the current student's dissertation topics.

The students present their research in a research forum every year. These presentations are attended by faculty and the quality of the presentations are high and mirror their respective dissertation lead faculty level(s) for excellence and quality.

The Director's program review lists graduate program outcomes (GPO), Student Learning Objectives (SLO), course listings, some evaluations on various dissertations presentations and posters. The GPO's seem generally appropriate. The SLO's are also appropriately listed in general the five exit interviews of the nine graduates describe the items mainly in the agree to strongly agree scores. The Director's report does not describe that dissertation evaluation and evaluations are kept within the college as a means for record-keeping but also for decision dispute.

The University stores copies of graduate's dissertations in Proquest. (<https://manoa.hawaii.edu/graduate/proquest-etd-submission-publication/>) Perhaps further institution support could be in the form of a digital comments program that quantifies downloaded dissertations.

### **Status of Degree Progression to Established**

The degree was granted provisional status in Fall 2011 and was set to expire in the 2018-2019 academic year. The application to move the provisional to established status would have been due in the 2018-2019 academic year. In June 2018, a request was submitted to the UH system for a one-year extension of the provisional status. This request was approved and the due date was pushed to the 2019-2020 academic year. As of April 2021, the Vice Chancellor for Academic Affairs provided notification that the PhD program has run out the provisional status, and technically does not have authorization as an existing program. The program director was informed that any offer of admission or holding of interviews would be misleading to any potential candidates and there are not any pending or offers for admission for the academic year 2021-2022.

### **Development of Research Infrastructure and Assessment of Adequacy of Fiscal, Physical and Information Resources**

#### **Research Infrastructure and Resource Support**

The Pharmaceutical Science faculty and their respective research labs from a facilities standpoint have met with a multitude of challenges.

In general, from 2007-2009, there was a lack of research lab bench space as well as teaching space at UHH. The faculty and students utilized teaching spaces on the main campus when available. The PS faculty hired in these early years spent much of their time building the PharmD foundational curriculum and academic infrastructure from 2007-2011.

In 2009, the college erected four portable modular buildings(A-D) with Building C dedicated for three research labs that housed five PS faculty. The rest of the research labs and faculty was housed at two other facilities. In late 2009, faculty labs were placed at the Waiakea Research Station (WRS) located approximately 10 miles from the UH Hilo campus. These labs remain in use. A third lab site was at the US Forestry Service from 2006-2018.

Although initial plans for Hale Kioh'ioh'i included research labs, due to budgetary constraints, the building design was modified to only hold education and administrative space.

The Modular buildings have shown tremendous wear due to age, the tropical climate and heavy rains typical to Hilo. Building C has experienced compromised structural issues that include bending floor boards due to the load of the sub-zero research freezers, erratic air conditioning and roof leaks. The DKICP with the support of UHH administration, has tried as best to remedy these structural challenges whilst lobbying for capital improvement funds from the legislature.

In 2018, the legislature awarded approximately \$7M for capital improvements. The scope of the project converts the two former lecture halls in Bldg. B to bench laboratories and funds a new building to house the NMR. As of June 23, 2021, the remodel is approximately 63% complete with an anticipated completion date at the end of 2021. The relocation of the WRS situated Pharmaceutical Science faculty would begin in early 2022 after certificates of occupancy are issued. Completion of this move will take until the summer of 2022.

### **Information Services**

Up until 2020, the DKICP had a full-time librarian as faculty. This position's maintains and manage the college's information resources, drug information, software, journals and books to serve both the Pharmaceutical Science and Pharmacy Practice faculty and students. This position still performs this function but has been moved to the main campus Mo'okini Library and 25% of the position is funded by the pharmacy budget. ACPE accreditation requires a dedicated library resource at least for the PharmD program.

### **Non-Academic Resources Support**

The research department provides support with one secretary and until 2019, funded two analytical lab technicians who maintained and serviced the shared analytical lab which houses two NMR's, HPLC, mass spectrometer, gas chromatograph and other shared equipment. One technician has since been moved to the main campus RCUH budget but continues to service and maintain the analytical lab. The other technician was put under one PS faculty extramural grant.

Two information technology specialists service the entire college for all IT needs and furnish support for all PS faculty computers and servers, maintains all interface with labs and other IT software support.

**Academic Faculty for PhD Degree Program**

Prior to 2019, there were 12 PS faculty. There are currently nine PS faculty with five at the rank of full professor, two at associate and two at assistant rank. In general,

**Financial Resources**

The Program Director has provided comment and the financial information currently available for the entire college as far as cost of degree, SSH for Instruction and other metrics. Further distillation of costs would be helpful to describe the accurate financial load of this particular degree. In general, tuition derived revenue is extremely strained and without significant support from extramural grant awards, the college will have a mounting challenge to support equipment, maintenance contracts, graduate assistant salaries and lab supplies. Table 2 lists the estimated summation of expenses and revenues of the PhD program from FY'13 to date. All expenses listed have been paid from tuition revenues.

**Table 2. Summation of PhD Program Expenses and Revenues (FY'13 to date)**

<b>Expenses</b>	
<b>Utilities – Mods Bldg. C + WRS FY'13-'19</b>	
Water	\$65,061
Electricity	\$1,519,281
Sewer	\$1,280
Gas	\$3,152
Equipment - new purchased from FY'11-'19	\$2,931,044
Lab Equipment Maintenance Contracts from FY'11-'21	\$1,412,603
Lab Supplies supplement to PS faculty FY'15-'20	\$422,330
NMR or general supplies (helium, gases) FY'11-'19	\$241,341
RTRF returned to PS faculty FY'17-'20	\$632,929
PhD student stipends paid '12-'15	\$424,008
PhD tuition paid by DKICP '12-'15	\$461,437
Student salary paid '16-'20 for GA positions allows for tuition waiver	\$707,149
<b>Estimated Total Expenses</b>	<b>\$8,821,615</b>
<b>Revenues</b>	
Tuition paid by students FY'19-'20	\$68,216
<b>Additional Financial Sources</b>	
Recurring Legislative funding for Rat Lung Worm FY'18	\$300,000
Donor support	\$22,700

The college pays its own utilities on all of their facilities. Paid utilities report lags by two years. The ability to document utilities specific to a building or area began in 2013.

In the beginning of the program (FY'12), PhD students were given a stipend and the college paid the tuition. Beginning in FY'16, graduate assistant (GA) positions were created which then qualified students for a tuition waiver under UH policy. Due to the decline in tuition revenues, the college stopped financing GA positions since the summer of 2020. Subsequently, several students have had to either seek employment and/or the principal investigator has had to fund the salary from their extramural grants. The UH policy typically follows this latter method of funding for GA positions. Given the size of the UHH campus the number of available GA positions are fairly limited. In these cases where a GA position does not fulfill the minimum work hours, the tuition waiver policy cannot be employed.

Table 2 does not include the portion of the PS salary dedicated to teaching the coursework for the PhD program. In general, workload equivalency availability from both degree programs is much less than what would be normal for the current quantity of the PS faculty.

### **Legislative and Philanthropic Funding**

In the 2017 legislative session, one faculty member received a recurring legislative set aside for \$300,000 per year for the study and intervention of Rat Lung Worm disease. There has not been indication from the legislature that future funding will cease or undergo reduction.

Science faculty, especially the junior faculty, have been collaborators of the JABSOM INBRE grant. The PhD Director is also a co-PI with the main campus for the SHARP Program, that supports undergraduate and graduate education for those with Native Hawaiian heritage.

### **DKICP Vision and Mission for Next Five Years**

The college's mission and vision will remain unchanged. Since Fall 2019, the college has been in a PharmD curriculum transformation process with an anticipated implementation date of Fall 2023.

The University describes four possible recommendations resulting from a PhD program review. These recommendations may include one or a combination of the following options.

1. Continue program in current format
2. Discontinue admissions, teach out currently enrolled students and stop out degree
3. Incorporate PhD program with another content related PhD program
4. Stop out degree and shift students to another PhD program until students complete degree

### **Future Program Challenges and Recommended Options**

The PhD degree in Pharmaceutical Sciences is a unique degree offered at UH Hilo and within the UH System. There remain significant challenges especially related to financial support and the maintenance of equipment that comes routinely with age and the ability for the faculty as well as the college to continue. In addition, the need for increasing extramural funding becomes imperative in order to keep the program viable.

The administration is sensitive to the fact that the degree may contribute to the overall strength of attracting NIH funded grants such as COBRE and other grants described in the Director's report.

A more realistic proposal to better assure financial stability and support, may be to consider options 2-4 above. Possible programs would include the UH Manoa science graduate degrees or the JABSOM biomedical science research program.