UNIVERSITY
OF MIAMI
FACULTY SENATE

Faculty Senate Office
Ashe Administration Building, #325
1252 Memorial Drive
Coral Gables, FL 33146

facsen@miami.edu
web site: www.miami.edu/fs
P: 305-284-3721
F: 305-284-5515

MEMORANDUM

To: Julio Frenk, President

From: Tomás A. Salerno
Chair, Faculty Senate

Date: January 31, 2019

Subject: Faculty Senate Legislation #2018-37(B) – Creation of a New Dual / Sequential Degree in Master of Science (MS) in Biochemistry and Molecular Biology and Master of Business Administration (MBA), Miller School of Medicine and Business School

[Reference Legislation ##2018-36(B) – Creation of a New Master of Science in Biochemistry and Molecular Biology, Miller School of Medicine]

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The Faculty Senate, at its January 30, 2019 meeting, voted to unanimously approve the proposal from the Miller School of Medicine (MSOM) to create a dual degree in Master of Science in Biochemistry and Molecular Biology (BMB) and Master of Business Administration (MBA). The MS is a new degree established by separate legislation. Students will seek each degree sequentially, first completing 30 credit hours for the MS degree and then an additional 44 credit hours for the completion of the MBA, for a total of 74 credits for both. The program is designed so that students can complete both degrees in two years.

In addition to a director from each school, the dual degree program will be overseen by the MS-MBA Steering Committee composed of two faculty members from each program.

The Faculty Senate does not approve budget concepts, therefore no budget information is included here.

This legislation is now forwarded to you for your action.

TAS/rh

Enclosure

cc: Jeffrey Duerk, Provost and Executive Vice President for Academic Affairs
Guillermo Prado, Dean, Graduate School
Henri R. Ford, Dean, Miller School of Medicine
John Quelch, Dean, Business School
Patricia Abril, Vice Dean and Professor, Graduate Studies, Business School
Sapna Deo, Director of Graduate Studies,Biochemistry and Molecular Biology

CAPSULE: Legislation #2018-37(B) – Creation of a New Dual Degree in Master of Science in Biochemistry and Molecular Biology and Master of Business, Miller School of Medicine and Business School

APPROVED: _____ DATE: 3/7/19
(President's Signature)

OFFICE OR INDIVIDUAL TO IMPLEMENT: Dean John Quelch and Dean Henri Ford

EFFECTIVE DATE OF LEGISLATION: IMMEDIATELY
(pending any additional approval by the Board of Trustees)

NOT APPROVED AND REFERRED TO: _____

REMARKS (IF NOT APPROVED): _____

UNIVERSITY OF MIAMI

Proposal Submission Checklist

Proposals are to be submitted to the Office of Assessment and Accreditation (OAA), if applicable, the Graduate Council (for graduate programs excluding Law and Medical), if applicable, and the Faculty Senate. Refer to the Procedures for Program Changes document for information on the approvals and notifications needed for program changes and the Proposal Submissions Specifications document for an explanation of the process and a list of the materials required.

(Please note that change approvals can take 2 semesters to complete.)

FORM INSTRUCTIONS:
1. Save/download the form as a pdf.
2. After completing the information below, print and scan the form.
3. Insert it with the background materials that are specified, in the order listed, and submit to facsen@miami.edu.
Please note: *only scanned versions can be accepted.*

Include this checklist at the beginning of each proposal.

KEY CONTACT PERSONNEL INFORMATION

First Name	Last Name	Proponent's Title
Sapna	Deo	Sequential degree: MS in Biochemistry-MBA

Department, if applicable	School/College
Biochemistry and Molecular Biology	Miller School of Medicine

E-mail	Phone
sdeo@med.miami.edu	305-243-4421

Title of Proposal

Sequential degree: MS in Biochemistry-MBA

(-continue to next page-)

MANDATORY MEMORANDA AND FORMAT

Please check that each item listed below is included in the proposal package of materials, in the ORDER as listed. The applicable title (i.e. Letter of Explanation, Memo from the Dean, etc.) is to precede each section in the materials.

Only proposals conforming to this format will be accepted.

1. This completed checklist.

2. Letter of explanation. (2-3 pages only, double spaced, 12 pt font)

◉ Yes ○ No

If no, explain why:

3. A memo from the dean(s) signifying approval of the faculty of the relevant School(s) / Colleges(s).

◉ Yes ○ No

If no, explain why:

4. A memo that all affected or relevant School / College Council(s) have approved.

◉ Yes ○ No

If no, explain why:

5. A memo from the department chair(s) signifying approval of the faculty of the relevant department(s).

◉ Yes ○ No

If no, explain why:

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6. A memo from the Office of Accreditation and Assessment (OAA) if the proposal involves academic programs (degrees, certificates, majors, minors, concentrations, specializations, tracks, etc.) such as new programs, closing programs, or program changes (such as changes in requirements, program length, modality, name, location).

(To be submitted by OAA to the Graduate Council or the Faculty Senate, as appropriate.)

◉ Applicable ○ Not applicable.

If not, explain why:

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7. A memo from the Graduate School Dean signifying approval of the Graduate Council (for graduate programs only).
(To be submitted to the Faculty Senate by the Graduate Council.)

◉ Applicable ○ Not applicable.

If not, explain why:

8. Academic Deans Policy Council (ADPC) approval, for interdisciplinary issues and as appropriate. Please consult with the Dean of the Graduate School or the Secretary of the Faculty Senate to check if this is needed.

◯ Yes ◉ No

If no, explain why:

Not interdisciplinary issues

9. Additional required documents as listed on the "Proposal Submissions Specifications," i.e. market analysis, budget information, assessment of library collections, etc. as specified.

List additional documents included:

Proposal included

End form.

UNIVERSITY OF MIAMI
MILLER SCHOOL
of MEDICINE

December 08, 2017

To,
Faculty Council
University of Miami

This letter requests review and approval of the proposed Master's in Biochemistry and Molecular Biology-MBA sequential degree Program in the Department of Biochemistry and Molecular Biology in collaboration with the UM School of Business.

The MS-MBA sequential degree program is innovative and will provide new educational opportunity for students who intend on joining workforce in industry, academia, and government laboratories. This program will be attractive to students, who are interested in pursuing biotechnology career opportunity since the program focuses on both biochemistry training as well as business training. The program will prepare students through coursework and research, enhancing their knowledge in biochemistry and enhance their management skills through the MBA program. The students will obtain MS degree in BMB after completing 30 credit hours and then join MBA program after fulfilling the admission criteria of the MBA program. Students will obtain MBA degree after completing the required 44 credit hours of work. The students will be able to finish two degrees in two years, which is a significant advantage. The program costs are designed to be revenue neutral in initial years since it utilizes current administrative structure of BMB graduate program. The program strives to contribute to the diversity of educational opportunities at the Miller School of Medicine. The BMB program is committed to making the MS-MBA program a success.

Sincerely,

Sapna K. Deo
Associate Professor, Graduate Program Director
Department of Biochemistry and Molecular Biology
University of Miami

Shanta Dhar

Shanta Dhar
Associate Professor
Department of Biochemistry and Molecular Biology
University of Miami

Department of Biochemistry and Molecular Biology
P O Box 016129 (R-629) Miami, FL 33101-6129
Location R Bunn Gautier Bldg , 1011 NW 15th Street Miami, FL 33136-1015
Phone: (305) 243-6265 Fax: (305) 243-3955

UHealth
UNIVERSITY OF MIAMI HEALTH SYSTEM
UNIVERSITY OF MIAMI
MILLER SCHOOL of MEDICINE

December 6, 2017

Sapna Deo, Ph.D.
Associate Professor
Graduate Program Director
Department of Biochemistry & Molecular Biology
University of Miami, Leonard M. Miller School of Medicine
R. Bunn Gautier Building
1011 NW 15th Street
Miami, FL 33136

Dear Sapna,

It was a pleasure learning about your proposed sequential degree program in Master of Science in Biochemistry & Molecular Biology-Masters of Business. I support BMB graduate program's initiative to create this new program.

This program fulfills the need of employers looking for students with both scientific and business training. It would also be attractive to students since they will gain laboratory-based training and business training essential for a successful career in the biotechnology industry. Furthermore, this program will expand the institutional educational offerings and is aligned with our goal of providing unique and creative educational opportunities.

I wish success to the proposed program and support your commitment to improving graduate education at the Miller School of Medicine.

Sincerely,

Edward Abraham, M.D.
Acting Executive Vice President for Health Affairs
Chief Executive Officer, UHealth
Dean and Chief Academic Officer
University of Miami, Leonard M. Miller School of Medicine

Edward Abraham, M.D.
Acting Executive Vice President for Health Affairs
Chief Executive Officer, UHealth
Dean and Chief Academic Officer
University of Miami, Leonard M. Miller School of Medicine
Don Soffer Clinical Research Center (DSCRC) | 1120 NW 14th Street | Suite 360R (R95)
Miami, FL 33136 | Tel: (305) 243-5677 | Fax: (305) 243-1698

UHealth
UNIVERSITY OF MIAMI HEALTH SYSTEM
UNIVERSITY OF MIAMI
MILLER SCHOOL
of MEDICINE

October 26, 2018

Sapna Deo, Professor
Graduate Program Director
Department of Biochemistry and Molecular Biology
Miller School of Medicine
University of Miami
Miami, FL 33136

Dear Sapna,

It is with great enthusiasm that I write this letter in support of the proposed MS in Biochemistry and Molecular Biology - Master of Business Administration Dual Degree Program.

This program would help address the needs of students seeking to join the field of scientific industry by training scholars in both laboratory-based settings and business essentials, thus helping to prepare them for successful careers in the biotechnology industry. Furthermore, this program expands the institutional educational offerings and meets the University of Miami's goal of providing creative and diverse educational opportunities to our students.

I support your commitment to improving graduate education at the Miller School of Medicine and making the MS-MBA dual degree program a success. In turn, I am in support of the proposed fixed tuition rate of $41,500.

Sincerely,

Henri R. Ford, MD, MHA

UHealth
UNIVERSITY OF MIAMI HEALTH SYSTEM

UNIVERSITY OF MIAMI
MILLER SCHOOL
of MEDICINE

Carl I. Schulman, MD
Professor of Surgery
Executive Dean for Research

October 22, 2018

Sapna Deo, Associate Professor
Graduate Program Director
Department of Biochemistry and Molecular Biology
Miller School of Medicine
University of Miami
Miami, FL 33136

Dear Sapna,

It is with great pleasure that I write in support of the MS in Biochemistry and Molecular Biology - Master of Business Administration Sequential Degree Program.

This program will be a great asset to our Graduate Program as it is targeted to students interested in joining the scientific workforce after their Master's Degree. Graduates from the MS-MBA program can find career opportunities in industry or government laboratories, and will be better prepared to apply for PhD or MD-PhD programs.

A high demand for Masters level-trained personnel with management experience exists in industry and other related areas, which can be fulfilled through the proposed program. After successful completion of this program, students will have more career options and an increasing likelihood of making important contributions to scientific progress and society. The new MS-MBA degree program will contribute significantly to the continued elevation in the quality and diversity of graduate training at the Miller School of Medicine.

I look forward to working closely with the Office of Graduate & Postdoctoral Studies and am committed to making the MS-MBA degree program a success. I am supportive of the fixed tuition rate of $41,500.

Sincerely,

Carl I. Schulman, MD, PhD, MSPH, FACS
Professor of Surgery
Executive Dean for Research
University of Miami Miller School of Medicine

UNIVERSITY OF MIAMI
MILLER SCHOOL
of MEDICINE

December 1, 2017

Shanta Dhar, PhD, Associate Professor
Department of Biochemistry & Molecular Biology

Dear Shanta:

It was a pleasure discussing your proposed Master of Science in Biochemistry & Molecular Biology program. I am pleased to support your proposal to create this new program.

The program would attract tuition-paying students who wish to improve their chances of getting into medical school or a PhD program in Biochemistry & Molecular Biology. Your vision for the proposed degree aligns well with institutional goals to expand educational offerings. Among many benefits to the school, I see this program attracting underrepresented minorities and creating yet another pipeline into our existing doctoral programs for those not immediately ready following undergraduate studies.

I support your commitment to improving graduate education at the Miller School of Medicine and wish you the best for a successful proposal.

Sincerely,

Zafar Nawaz, Ph.D.
Professor of Biochemistry and Molecular Biology
Senior Associate Dean of Graduate and Postdoctoral Studies

Office of Graduate & Postdoctoral Studies • Leonard M. Miller School of Medicine
Post Office Box 016960 (M-857) • Miami, Florida 33101
Location: 1600 NW 10th Avenue, RMSB 1128D L/C M857 • Miami, Florida 33136
305-243-1094 • Fax: 305-243-3593 • E-mail: ogps@med.miami.edu

Subject: FW: Biochemistry-MBA program review
Date: Thursday, October 25, 2018 at 12:05:37 PM Eastern Daylight Time
From: Lowman, Charles A
To: Deo, Sapna K.
Attachments: MS in Biochemistry-MBA program[2].pdf

FYI

From: Lee, David J, Ph.D.
Sent: Thursday, October 25, 2018 11:45 AM
To: Prado, Guillermo J, Ph.D. <GPrado@med.miami.edu>
Cc: Lowman, Charles A <calowman@med.miami.edu>; Schulman, Carl Ivan, Ph.D. <CSchulman@med.miami.edu>
Subject: Biochemistry-MBA program review

Charles and I met today to go over the history of the program review initiated by Dr. Nawaz. I fully support moving this application to the next stage of the review process.

David J. Lee PhD, Professor
Project Director/PI, Florida Cancer Data System
Sylvester Comprehensive Cancer Center
Director of Graduate Programs
Department of Public Health Sciences
Chair of Graduate Programs
Office of Graduate Studies
University of Miami Miller School of Medicine
Clinical Research Building
1120 N.W. 14th Street, Room # 911
Miami, FL 33136
305-243-6980
Dlee@miami.edu

MIAMI
BUSINESS SCHOOL

MEMORANDUM

TO: General Welfare Committee
Faculty Senate

FROM: John Quelch
Dean, Miami Business School

Subject: Proposed MS in Biochemistry and Molecular Biology – MBA Sequential Degree Program

Date: March 2, 2018

On behalf of the University of Miami Business School, I am pleased to write in support of the MS in Biochemistry and Molecular Biology – MBA sequential degree program in collaboration with the Miller School of Medicine.

This program embodies the Roadmap's initiatives of educational innovation and interdisciplinary collaboration. It prepares candidates for top careers requiring the managerial skills, business acumen, and financial sophistication.

UHealth
UNIVERSITY OF MIAMI HEALTH SYSTEM

UNIVERSITY OF MIAMI
MILLER SCHOOL
of MEDICINE

July 20, 2018

Tomas Salerno, M.D.
Chair, Faculty Senate
University of Miami
Ashe Building, Suite# 325
252 Memorial Drive
Coral Gables, FL 33146

Re: Council Approved a Proposal for a Master's in Biochemistry and Molecular Biology- Master's of Business Administration Sequential Degree Program.

Dear Dr. Tomas Salerno,

This is to inform the Faculty Senate that the Medical School Faculty Council met on July 10, 2018 to review the **Proposal for a Master's in Biochemistry and Molecular Biology- Master's of Business Administration Sequential Degree Program.**

The council members voted to *approve* the proposal.

Respectfully submitted,

Sanjoy Bhattacharya, M.Tech, Ph.D.
Speaker, Medical Faculty Council

MIAMI
BUSINESS SCHOOL

MEMORANDUM

August 30, 2018

TO: Faculty Senate

FROM: W. Brian Barrett, Speaker of the School Council
Anita Cava, Professor, Business Law, Second Vice Chair, School Council
Shirley Dennis-Escoffier, Associate Professor, Accounting,
First Vice Chair, School Council
Howard Gitlow, Professor, Management Science
Karoline Mortensen, Associate Professor, Health Management and Policy
A. Parasuraman, James W. McLamore Chair and Professor, Marketing
Philip Robins, Professor, Economics
Sara Rushinek, Professor, Business Technology
Chester A. Schriesheim, Professor, Management

SUBJECT: Approval of Sequential Degree Program

The School Council, at its February 2, 2018 meeting, voted unanimously to approve the sequential degree program, MS in Biochemistry and Molecular Biology AND the MBA.

Please note that the voting members of the Miami Business School (MBS), the regular faculty per the MBS bylaws, voted to delegate all decisions on curriculum issues to their elected representatives on the School Council for the fall 2017-spring 2018 academic year.

SYLVIA DAUNERT
PROFESSOR AND LUCILLE P. MARKEY CHAIR

UHealth
UNIVERSITY OF MIAMI HEALTH SYSTEM

UNIVERSITY OF MIAMI
MILLER SCHOOL of MEDICINE

Department of Biochemistry and Molecular Biology • R. Bunn Gautier Bldg. • 1011 NW 15th Street
Miller School of Medicine • University of Miami • Miami, FL 33136 • (305) 243-4005 • sdaunert@med.miami.edu

September 04, 2018

Dr. Thomas Salerno
Chair, Faculty Senate
University of Miami

Dear Dr. Salerno:

This letter is in support of the petition for approval of the proposed Master's in Biochemistry and Molecular Biology-MBA sequential degree Program in the department of Biochemistry and Molecular Biology in collaboration with the UM School of Business. As part of the educational mission of our department, we strive to provide innovative and timely curriculum opportunities to students while delivering high quality of teaching and service. The MS-MBA sequential degree program is innovative and timely since it will provide the necessary training for students who intend on joining workforce in industry, academia, and government laboratories.

The proposed MS-MBA Program will, through coursework and research, provide highly motivated students with outstanding educational opportunities to broaden their knowledge and enhance their laboratory skills in biochemistry to enhance their preparation for careers in biotechnology field. The program will use elements of our graduate programs including coursework and research programs in BMB. The program costs are designed to be revenue neutral in initial years since it utilizes current administrative structure of BMB graduate program. The students will obtain MS degree in BMB after completing 30 credit hours of work as required by the UM graduate school policy. Students will then join MBA program after fulfilling the admission criteria of the MBA program and will obtain degree after completing the required 44 credit hours of work.

We anticipate that our proposed MS-MBA program will be an attractive program for a population of students, who are interested in pursuing biotechnology career opportunity where both laboratory and leadership roles are valued. The students will be able to finish two degrees in two years, which is a significant advantage. Additional benefits of the proposed program are (1) enrichment the quality of our undergraduate and graduate programs in BMB by attracting a class of exceptional students, (2) strengthen the alumni base, and (3) qualified students will be giving 50% scholarship for the MBA portion of the degree allowing students to obtain 2 degrees at lower cost.

There is no doubt in my mind that this new program will bring the Miller School of Medicine of the University of Miami to the forefront of innovative biomedical educational. Given all of the above, the department faculty and I are strongly in favor of the creation of the MS and MS-MBA Program in Biochemistry and Molecular Biology and urge you to support it as well.

Sincerely,

Sylvia Daunert

Sylvia Daunert, Ph.D.
Professor and Lucille P. Markey Chair
Associate Director, Dr. JT Macdonald Biomedical Nanotechnology Institute
Department of Biochemistry and Molecular Biology

UNIVERSITY
OF MIAMI

Assessment and Accreditation
Gables One Tower 1320 S. Dixie Hwy.
Coral Gables, Florida 33146

Phone: 305-284-5120
Fax: 305-284-4929
oaa.miami.edu

MEMORANDUM

DATE: August 28, 2018

TO: Sapna K. Deo, Professor and Graduate Program Director
Miller School of Medicine

FROM: Patty Murphy, Executive Director
Office of Assessment and Accreditation

RE: New MS in B&MB-MBA Dual Degree Program

On August 22, 2018, the Miller School of Medicine (MSOM) notified my office of its intent to offer a new dual degree program: Master of Science (MS) degree program in Biochemistry and Molecular Biology and Master of Business Administration (MBA). [The MS program is new and is being proposed separately. This proposal assumes approval of that program (which does not involve a substantive change).]

Students will pursue each degree sequentially, first completing 30 credits for the MS degree and then 44 additional credits to complete the MBA for a total of 74 credits for both degrees. The program is designed so that students can complete both degrees within two years.

Dr. Sapna Deo, Professor and Director of Graduate Studies of Biochemistry and Molecular Biology in MSOM, will oversee the MS component of the dual degree program. Patricia Abril, Vice Dean of Graduate Studies and Professor in the Business School, will oversee the MBA component of the dual degree program. There will be additional oversight by the MS-MBA Steering Committee composed of two faculty members from each program.

The proposed new dual degree program does not "represent a significant departure, either in content or method of delivery" from what we are currently approved by SACSCOC to offer due to the following:

- The proposed dual degree program meets the SACSCOC requirement of a minimum of 60 credit hours for two graduate programs.
- No new courses are being added to support the dual degree program.
- The proposed dual degree program will be supported by current faculty.
- The proposed dual degree program will be coordinated by qualified faculty: Dr. Sapna Deo, Patricia Abril, and the MS-MBA Steering Committee.
- The dual degree program will involve existing degree programs (pending approval of the MS program).
- The majority of the proposed dual degree program will not be offered via distance education and, in any case, the University is approved to offer 100% distance education programs.
- The programs will be offered on the University's Coral Gables and Medical campuses.

- Both graduate programs meet the SACSCOC requirements for literature in the field and ongoing student engagement in research and/or appropriate professional practice and training experiences.

SACSCOC only requires notification of program changes that represent a significant departure from our current programs. Therefore, no notification or approval is required for this change.

Please contact me if you have any questions at pattymurphy@miami.edu or (305) 284-3276.

CC: Faculty Senate
Guillermo Prado, Dean of the Graduate School
Patricia Abril, Vice Dean, Business School
Shanta Dhar, Associate Professor, Miller School of Medicine
John Quelch, Dean, Business School
Henri Ford, Dean and CAO, Miller School of Medicine
Karen Beckett, University Registrar
Carrie Glass, Executive Director of Student Financial Assistance and Employment

UNIVERSITY OF MIAMI
GRADUATE SCHOOL

1252 Memorial Drive
P.O. Box 248125
Coral Gables, FL 33124-4629

Phone: 305-284-4154
Fax 305-284-5441
graduateschool@miami.edu

MEMORANDUM

DATE: November 14, 2018

TO: Tomas Salerno
Chair, Faculty Senate

FROM: Guillermo (Willy) Prado
Dean, The Graduate School

SUBJECT: Proposal – MS in Biochemistry and Molecular Biology/MBA Dual Degree

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The Miller School of Medicine submitted a proposal for a MS in Biochemistry and Molecular Biology/MBA dual degree program. The proposal was discussed at the meeting of the Graduate Council on Tuesday, November 13, 2018, and was approved by those present.

cc: John Quelch, Dean, Miami Business School
Patricia Abril, Vice Dean, Miami Business School
Henri Ford, Dean, Miller School of Medicine
Sapna Deo, Graduate Program Director, Department of Biochemistry and Molecular Biology, Miller School of Medicine
Shanta Dhar, Associate Professor, Department of Biochemistry and Molecular Biology, Miller School of Medicine
Patty Murphy, Executive Director, Office of Assessment and Accreditation

Proposal to establish a new
MS in Biochemistry and Molecular Biology – Master of Business Administration
Sequential Degree Program

Submitted by

Sapna Deo, Ph.D.
Associate Professor and Graduate Program Director
Department of Biochemistry and Molecular Biology

Shanta Dhar, Ph.D.
Associate Professor
Department of Biochemistry and Molecular Biology

Patricia Abril, J.D.
Vice Dean of Graduate Programs and Executive Education
School of Business Administration

July 2018

TITLE OF THE DEGREE. MS-MBA.

EXECUTIVE SUMMARY

The Biochemistry and Molecular Biology (BMB) Graduate Program at the University of Miami Miller school of Medicine is requesting approval for a new sequential degree program, MS-MBA. The master's degree in BMB will emphasize on laboratory-based or industrial research training, which combined with an MBA degree, will prepare students for careers in industry, academia, and government laboratories. The BMB graduate program is currently involved in PhD training. This new program will utilize the existing procedures and policies for admission in collaboration with the Office of Graduate and Postdoctoral Studies (OGPS). Our program is targeted to students interested in joining science workforce after the bachelor's degree in industry, academic, and government laboratories. The program is also suitable for students requiring additional background in BMB in order to pursue PhD or MD-PhD programs if they chose to pursue these paths after obtaining MS degree. The program will be useful for students who would like to transition into laboratory science workforce faster but were not prepared for laboratory or research hands-on experience during their undergraduate degree. We envision that the graduates from MS-MBA program will find career opportunities in industry or government laboratories. Additionally, these students will be better prepared for apply for PhD or MD-PhD programs.

PURPOSE AND GOAL

The discipline of biochemistry is at the center of the basic biomedical sciences, as detailed mechanistic understanding of biochemical pathways and processes are critical in clinical medicine and discovery in both academic and industrial settings. This is reflected by the increased need from industry, academia, and governmental laboratories for students trained in molecular biology techniques and protein chemistry. Therefore, we plan to develop a MS in BMB with emphasis on laboratory-based training. Additionally, the opportunity to obtain an MBA degree in a sequential manner will help prepare students to transition into careers faster. The majority of the Master's programs available to students in the US have higher emphasis on the course work. However, the student would benefit most from the hands-on laboratory training combined with management skills. This program will also emphasize on skills necessary to enter biotechnology, pharmaceutical, and healthcare workforce. Students will be able to obtain 2 degrees in 2 years with a significant cost saving. This type of training along with a shorter time duration of a Master's program would be very attractive to students who are seeking employment in industry. This training would prepare students to go into the workforce better than just an undergraduate degree in science, which does not train them heavily on practical skills nor in management skills. Additionally, students who want to pursue PhD or MD-PhD degree and are either lacking necessary research credentials or are not sure about pursuing these studies would benefit from this Master's program. These students may opt to pursue MBA or pursue PhD, MD-PhD path first followed by an opportunity to an MBA. A high demand for Masters level trained personnel with management experience exists in industry and other related areas, which we plan to fulfill through the proposed program.

MARKET ANALYSIS

The market for master's programs is large as evidenced by the number of students admitted in a local University, specifically, Barry University, which admits about 250 students per year. Nationally, John's Hopkins (50-53 students enrolled in MS in BMB) and Georgetown University (50 students enrolled in MS in BMB) also have a large Master's student population. The MiBS program newly developed at UM

Miller School of Medicine received 90 applicants this year within 2-month time period without any marketing of the program for a class size of 20 students. MiBS program is targeted toward students interested in pursuing medical school. A large number of our UM undergraduates go on to enroll in Masters and PhD programs after finishing an undergraduate degree. Therefore, we are confident that we will be able to attract a large pool of applicants without competing with other Master's program at our university.

PROGRAM DETAILS

Length of the Program

The MS in BMB will be completed in one or two years depending on the track and electives and will consist of 30 credits. The MBA portion of the sequential degree may be completed in one year and will consist of 44 credits.

Curriculum

Research Track.

A. The duration for MS in BMB will be 1 year and following is the suggested curriculum for the program. Details of each course is given in Appendix 1.

- Fall
  - Ethics, RCR, Professional Skills Workshop- 1 credit
  - BMB 701-Journal Club in BMB- 1 credit
  - BMB705-Biochemistry– 3 credits
  - BMB714-Molecular Genetics- 3 credits
  - BMB 831- Research in BMB- 4 credits
- Spring
  - BMB 701-Journal Club in BMB- 1 credit
  - BMB710-Elective Select 1–Nanomedicine, Cancer Signaling, Structural Biology and Applications to Drug Discovery, Molecular Neuroscience of the Brain, Nutritional Biochemistry and Metabolism, etc.- 3 credits
  - BMB 745 Current Topics in BMB -3 credits
  - BMB 831- Research in BMB- 5 credits
- Summer
  - BMB 831- Research in BMB- 6 credits

Industry Track.

The total duration may vary from 1-2 years.

- Fall

- Ethics, RCR, Professional Skills Workshop- 1 credit
- BMB 701-Journal Club in BMB- 1 credit
- BMB705-Biochemistry– 3 credits
- BMB714-Molecular Genetics- 3 credits
- BMB 740- Biotechniques course 3 credits
-

- Spring
  - BMB 701-Journal Club in BMB- 1 credit
  - BMB710-Elective –Nanomedicine, Cancer biology, Structural Biology and Applications to Drug Discovery, RNA biology, Molecular Neuroscience of the Brain, Nutritional Biochemistry and Metabolism, etc.- 3 credits
  - BMB 741- Biotechniques course II- 3 credits
  - Capstone- 2 credits

- Summer
  - BMB 832-Internship- 9 credits
  - BMB 833-Capstone-1 credit

The following courses, Ethics, RCR, and Professional Skills Workshop (Dr. Zafar Nawaz), BMB 740 Biotechniques I (Dr. Yanbin Zhang), BMB 741 Biotechniques II (Dr. Zafar Nawaz), BMB 745 Current Topics in BMB (Dr. Sapna Deo), Internship (Dr. Feng Gong), Capstone (Dr. Feng Gong), BMB831 research course (Dr. Feng Gong) will be newly created. The cost associated with teaching all the courses newly designed or existing ones is included in the budget.

Grading Policy:
All of the courses listed above will be given letter grades. The grading policy will be decided by the instructor of the course and will follow the university guidelines.

B. The MBA portion of the sequential degree program will be offered in the format of the existing MD-MBA and PhD-MBA program. The duration of MBA degree program will be 1 year and follow the curriculum given on the next page. This is the Professional MBA program that requires 44 credits to get the degree. The courses will be offered in a classroom format.

MS in Biochemistry and Molecular Biology - MBA Dual Degree
MBA Progress Sheet (44 credits)

Name: **Student I.D. Number:**

FALL 2018			
Term 1-1 (12 credits)		**Semester**	**Grade Notes**
ACC 670 Financial Reporting and Analysis	**(2 credits)**	Fall 2018	ACC 670/35 M/W 1:15 – 3:15 ACC 670/37 M/W 3:30 – 5:30
BUS 604 Career Development and Enrichment	**(2 credits)**	Fall 2018	
ECO 685 Managerial Decisions in a Global Economy	**(2 credits)**	Fall 2018	ECO 685/52 T/R 10:15 – 12:15 ECO 685/55 T/R 1:15 – 3:15

MGT 675 Business Policy and Strategy	**(2 credits)**	Fall 2018	MGT 675/35 M/W 1:15 – 3:15 MGT 675/37 M/W 3:30 – 5:30
Elective	**(2 credits)**	Fall 2018	
Elective	**(2 credits)**	Fall 2018	

Term 1-2 (11 credits)		**Semester**	**Grade**	**Notes**
ACC 671 Accounting for Decision Making	**(2 credits)**	Fall 2018	ACC 671/32 M/W 10:15-12:15 ACC 671/35 M/W 1:15 – 3:15	
BUS 603 Critical Thinking and Effective Speaking	**(1 credit)**	Fall 2018	BUS 603/67 T 3:30 – 5:30 BUS 603/68 T 5:45 – 7:45 BUS 603/77 R 3:30 – 5:30 BUS 603/78 R 5:45 – 7:45	
MAS 631 Statistics for Managerial Decision Making	**(2 credits)**	Fall 2018	MAS 631/52 T/R 10:15 – 12:15 MAS 631/55 T/R 1:15 – 3:15	
MGT 620 Managing Through People	**(2 credits)**	Fall 2018	MGT 620/32 M/W 10:15 – 12:15 MGT 620/35 M/W 1:15 – 3:15	
Elective	**(2 credits)**	Fall 2018		
Elective	**(2 credits)**	Fall 2018		

SPRING 2019

Term 1-3 (11 credits)		**Semester**	**Grade**	**Notes**
BUS 604 Career Development and Enrichment	**(1 credit)**	Spring 2019		
FIN 641 Valuation and Financial Decision Making	**(2 credits)**	Spring 2019	FIN 641/35 M/W 1:15 – 3:15 FIN 641/37 M/W 3:30 – 5:30	
MAS 632 Management Science Models for Decision Making	**(2 credits)**	Spring 2019	MAS 632/52 T/R 10:15 – 12:15 MAS 632/55 T/R 1:15 – 3:15	
MKT 640 Foundations for Marketing Management	**(2 credits)**	Spring 2019	MKT 640/35 M/W 1:15 – 3:15 MKT 640/37 M/W 3:30 – 5:30	
Elective	**(2 credits)**	Spring 2019		
Elective	**(2 credits)**	Spring 2019		

Term 1-4 (10 credits)		**Semester**	**Grade**	**Notes**
BTE 610 Foundations of Management Information Systems	**(2 credits)**	Spring 2019	BTE 610/52 T/R 10:15 – 12:15 BTE 610/55 T/R 1:15 – 3:15	
FIN 642 The Financial Environment (2 credits)		Spring 2019	FIN 642/35 M/W 1:15 – 3:15 FIN 642/37 M/W 3:30 – 5:30	
MGT 643 Principles of Operations Management	**(2 credits)**	Spring 2019	MGT 643/35 M/W 1:15 – 3:15 MGT 643/37 M/W 3:30 – 5:30	
MGT 677 Corporate Strategy and Organization	**(2 credits)**	Spring 2019	MGT 677/50 T/R 8:00 – 10:00 MGT 677/52 T/R 10:15 – 12:15	
Elective	**(2 credits)**	Spring 2019		

Recruitment

The department of Biochemistry and Molecular Biology in partnership with School of Business will be jointly responsible for marketing the sequential program.

We will devise a recruitment plan that will focus on advertising the program to potential students by employing a series of strategies as described below.

- The BMB department will inform UM undergraduate academic counselors about the program so that they can inform graduating students prior to starting their new industrial jobs. Similarly, we will inform undergraduate counselors from other universities and colleges in Florida.

- The program will be advertised through the web on the BMB departmental website.
- The BMB department will contact current BMB undergraduate students and alumni to inform them about the program to start a word-of-mouth advertising campaign.
- A representative of the program, i.e., Director of MS Program, will attend and present the program at target conferences that are well attended by undergraduate students, such as the ACS, ASBMB, AAPS, PITTCON, etc.
- The MS Program Director will communicate directly with prospective students as well.

Admission Process

MS Admission Requirements and Process

- In order to be admitted to this program, eligible students must have a Bachelor of Science degree in a basic science or related discipline.
- A cumulative grade point average of 3.0.
- Applicants must submit scores of their Graduate Record Examination (GRE) or the Medical College Admission Test (MCAT). Competitive score is required with a minimum score of 50 percentile.
- Additionally, the applicants will be required to submit two letters of recommendation and a personal statement.
- Applicants who have not received a degree from a university in the United States should also satisfy the English proficiency requirements by submitting TOEFL scores.
- The applications will be evaluated by the MS Admission committee.

MBA Admission Requirements and Process

- BMB MS program director will prescreen MS students to verify their good academic standing. A cumulative grade point average of at least 3.0 is generally required. The names of approved students will be communicated to the Director of Graduate Business Full-Time Programs at the Miami Business School.
- Applicants must obtain a combined GMAT score of at least 660 prior to admission to the MBA program.
- Application process. The logistics of the application process will follow the same process as that of MD-MBA and PhD-MBA program and is outlined below.
    - The first step is to submit an application via our application portal: https://www.applyweb.com/miamibus/index.ftl
    - Documents to submit:
    - 1. Online application
    - 2. Official transcripts
    - 3. GMAT scores (a minimum of 660 score is required)
    - 4. Resume
    - 5. 3 letters of recommendation
    - 6. TOELF/IELTS for international students
    - Once the application is submitted and the supporting documents are attached the candidate is contacted for an interview with an admission advisor.
    - The file is then submitted for decision by the committee.
    - The candidate is notified of the decision via email and a mailed letter.
- Students must apply to the MBA program by March 15 each year.

- The program will be run in the format of the existing MD-MBA/ PhD-MBA program.

Program Administration, Overview, And Academic Direction

1. Program Direction And Day-To-Day Coordination

MS Program Director, MSPD, Dr. Sapna Deo (CV included as Appendix 3). The administration and direction of the MS in Biochemistry and Molecular Biology program will be under a BMB's MSPD. The MSPD will report to the Chair of BMB. The MSPD will be part of the Operating and Admission Committee, and will be responsible for ensuring the overall performance of the program. She will be responsible for the recruitment and admission of students in the program and will ensure that students meet the requirements of the UM graduate school admission policy. Moreover, the progress and guidance of the student will be monitored by the MSPD in collaboration with the co-directorof the program. The MSPD and he co-directorwith help from the Graduate Coordinator, will organize all activities stipulated in the program and required for progress of the students.

MS Program, Co-Director, Dr. Feng Gong. (CV included as Appendix 4) Dr. Gong will be responsible for monitoring student progress along with Dr. Deo. He will help with monitoring curriculum, industrial internship, and enrolling students in the required courses. Dr. Gong will help students identify research group, industrial internship and fulfill the degree requirements. He will be responsible for ensuring the availability of courses for students and their academic performance. He will co-ordinate with Dr. Deo and the operating committee if there are any issues to be resolved related to student conduct or academic performance.

Graduate Coordinator. The BMB Graduate Program Coordinator will help with the admission process, functioning of the program, ensuring that students attend courses, complete assignments on time, and perform course evaluations. The Graduate Program Coordinator will ensure that records are properly entered, that students are credited for courses they have completed, and will also help address specific questions that may arise during the course of running the program. He/she will also provide support to the MSPD for managing the program and providing support for the overall mission.

2. PROGRAM OVERVIEW

BMB MS Program Operating Committee. The Operating Committee will consist of five faculty from the BMB department including the MSPD. The Operating Committee will oversee the program. The committee will create, maintain, and coordinate curriculum for the program. The committee will also establish and review program policies and conduct yearly evaluation of the program.

MS Admission Committee. The MS Admission Committee will consist of five faculty members from BMB department. The MS Admissions Committee will evaluate applicants and process the admission into the program.

MS-MBA Steering Committee. This committee will consist of 4 members, 2 each from BMB and School of Business. This committee will meet every six months and evaluate the sequential degree program. The committee will evaluate the success of the program and suggest any necessary changes as needed to improve the program.

TUITION COSTS

Students are expected to cover their tuition, and any living or other expenses incurred during their study. MS degree in BMB will cost $41,500, a fixed cost for 30 credits. The Miami Business School will only charge for 22 credits of the 44 credits program (50% scholarship). Those students who do not have high GMAT may have opportunity to complete MBA within 1 year but may not qualify for 50 % scholarship.

GRADUATION REQUIREMENTS

MS Degree

As per the UM Graduate school guidelines each MS student is expected to complete 30 credit hours of work. The minimum residence requirement is two semesters in full-time study or the equivalent in part-time work. In practice, most students need at least three semesters, or two semesters (24 credits) plus summer work (6 credits), to complete degree requirements. The UM graduate school recommends that for MS degree "In most programs a comprehensive examination, either written, oral or both, is a requirement. When the thesis is not a part of the program, an examining board, at least one of whose members must be a regular member of the Graduate Faculty, will be appointed by the program." In accordance with this recommendation, we have designed the following requirements for obtaining the proposed MS degree.

The requirements for graduation with MS degree include the following:

- Successful completion of 15 credit hours of required courses and 15 credit hours of research work totaling 30 credit hours.
- A final oral comprehensive examination of the research performed- A student failing the comprehensive may be allowed one opportunity to retake it if the student's committee so advises. The re-examination may not be taken during the same semester or summer session and must be taken within one calendar year.

MBA Degree

The requirements for graduation with MBA degree include successful completion of 44 credit hours of courses.

PROGRAM POLICY AND REVIEW

Plagiarism

Plagiarism is explicitly outlawed at University of Miami Miller School of Medicine. The BMB Graduate Program will not tolerate plagiarism. Students who are found to have plagiarized may be asked to withdraw from the Program. Plagiarism is not always easy to define; students who are unsure whether a particular practice is acceptable are urged to discuss the issue with the faculty instructor or mentor.

Dismissal and Appeals

Students can be dismissed by the Program for academic or professional reasons. Decisions on dismissal are made by majority vote of the BMB Program Operating Committee. To appeal a major programmatic decision (e.g., dismissal, denial of degree), students should first present their reasons for appealing to the MS Program Director and BMB Program Operating Committee. This appeal will be given a fair and impartial hearing, followed by a decision made by majority vote. If the student remains dissatisfied with the result of this appeal, the student may appeal the program decision, in writing, to the Senior Associate Dean for Graduate Studies, within 30 days of the program's final decision. Decisions by the Senior Associate Dean are appealable to the Dean of the Graduate School through the filing of a formal Graduate School Grievance.
https://grad.miami.edu/policies-and-forms/index.html

Conflict of Interest Policy.

We will follow and enforce the stringent standard conflict of interest policies that are currently in place at UM for the BMB personnel involved in the program.

MS in Biochemistry and Molecular Biology Graduate Program Review.

This program will be reviewed every seven years as per the Graduate School regulation. A self-study report will be prepared for the review process. Typically, three UM graduate faculty members from outside the Program will form an Internal Review Committee who will review the self-study report prior to sending the report to external reviewers. Members that form the internal and external committees will be selected by the Dean of the Graduate School. The External Review Committee will submit their report following a site visit. The report from the external reviewers, the Internal Review Committee memo of response and the Program response will be presented to the Graduate Council. If the Graduate Council accepts the reports, the program review will be considered accepted. The Dean of the Medical School, Chair of the Department of Biochemistry and Molecular Biology, Graduate Program Director, and Dean of the Graduate School meet with the Provost to discuss the program review. After the Provost's approval, the documents will then be forwarded to the SACS office. The Graduate School will send a memo to the Faculty Senate and the Graduate Program indicating whether the program review was approved. These steps and the guidelines established by the University of Miami Graduate School will be followed. These guidelines are available at the following website.
https://grad.miami.edu/policies-and-forms/index.html

Bylaws

Bylaws of the Graduate School that will be followed by the proposed program are available at the following website,

https://grad.miami.edu/_assets/pdf/bylaws-of-the-graduate-school.pdfAdditional bylaws pertaining to the MS program in the Department of Biochemistry and Molecular Biology are listed below.

I. Program Committees

A. BMB MS Operating Committee

The Operating Committee will oversee the MS program. The committee will meet every 2 months. The committee will establish and review program policies, oversee the curriculum for the program, and conduct yearly evaluation of the program. The committee will create, maintain, and coordinate curriculum for the program.

B. MS Admissions Committee.

The committee will meet every 2 months and help in implementing the admission policies developed by the Operating Committee. The committee will also evaluate and conduct the admission process.

C. MS-MBA Steering Committee

This committee will consist of 4 members, 2 each from BMB and School of Business. The committee will meet every six months and evaluate the sequential degree program.

Selection and term of the committee members and Chair

i) Each member of the committee will serve a 4-year term.
ii) The Operating Committee will choose the new member from the graduate faculty of the program. All members of the graduate faculty of the program will serve on the Operating Committee on a rotating basis.
iv) The will be the Chair of the Operating Committee. The chair of the Admission committee will be a tenure-track primary member of the BMB department. The Chair's term will be for a minimum of two years with a possible reappointment for additional 2 years upon mutual agreement of the Chair and the Operating Committee members. When needed, a new Chair will be selected by the Operating Committee members.
v) The Chair of the Department of Biochemistry and Molecular Biology is an *ex officio* member of the Operating Committee.

V. Participating Faculty

i) Faculty in the MS program in the Department of Biochemistry and Molecular Biology must have appointments in the Graduate Faculty of the University of Miami.

ii) Members of the Graduate Program of BMB with primary and secondary appointments are members of the MS program.

iv) Faculty members of the University of Miami are eligible to become members of the Biochemistry and Molecular Biology Graduate program. Their inclusion will be decided on an individual basis by the program faculty.

VI. Changes to the Bylaws

Changes to these bylaws requires a 2/3 vote from the Operating Committee which will take into consideration the recommendation from full faculty.

Monitoring Quality of the MS Program

The program Director, co-director, and the graduate program faculty will consistently and continuously monitor the quality of the program. The operating committee will meet every 2 months and the program faculty will meet yearly to discuss the performance of the program and the MS students. The student input will be received through the formal student evaluation of each course and we will also perform exit interviews of the graduating students. We will monitor the output in terms of how many students pursue their next career in industry, government labs, or academic research. We will also monitor how many students how many complete MBA degree and how many get into PhD or MD-PhD programs. We will maintain a contact with our Masters alumni and get their feedback about the program at specific intervals.

TISSUETECH
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Dr. Sapna Deo, PhD

Professor & Graduate Program Director

Department of Biochemistry and Molecular Biology

University of Miami Miller School of Medicine

Email: SDeo@med.miami.edu

Dear Dr. Deo,

It is timely to have the Master's program in Biochemistry and Molecular Biology at University of Miami Miller School of Medicine. An important component of Master's program in Biochemistry and Molecular Biology Industry track at University of Miami is to identify industrial internship opportunity for students. TissueTech Inc has a tradition of providing internships in our company to undergraduate and graduate students. The proposed program aligns with our mission to serve the community. Industrial internship is an exciting concept and mutually beneficial to the company and students. Typically, our company provides a summer internship opportunity for students for 2-3 months. We are happy to consider the students in your program for an internship opportunity in our company.

Sincerely,

Scheffer C. G. Tseng, M.D., Ph.D.
Chief Technology Officer
Mobile: 305-803-6925
Direct: 786-422-8699
TissueTech™, Inc.
7300 Corporate Center Drive, Suite 700
Miami, Florid

BERG LLC
500 Old Connecticut Path
Framingham, MA 01701

BERG™

Niven R. Narain, Ph.D.
Co-founder, President & CEO

Dr. Sapna Deo, PhD

Professor & Graduate Program Director

Department of Biochemistry and Molecular Biology

University of Miami Miller School of Medicine

Email: SDeo@med.miami.edu

Dear Dr. Deo,

It is timely to have the Master's program in Biochemistry and Molecular Biology at University of Miami Miller School of Medicine. An important component of Master's program in Biochemistry and Molecular Biology Industry track at University of Miami is to identify industrial internship opportunity for students. Berg has a tradition of providing internships in our company to undergraduate and graduate students. The proposed program aligns with our mission to serve the community. Industrial internship is an exciting concept and mutually beneficial to students and the company. Typically, our company provides an internship opportunity for students for 2-3 months. We are happy to consider the students in your program for an internship opportunity in our company.

Kind regards,

Niven R. Narain, Ph.D.

Dr. Sapna Deo, PhD
Professor & Graduate Program Director
Department of Biochemistry and Molecular Biology
University of Miami Miller School of Medicine
Email: SDeo@med.miami.edu

Dear Dr. Deo,

It is timely to have the Master's program in Biochemistry and Molecular Biology at University of Miami Miller School of Medicine. An important component of Master's program in Biochemistry and Molecular Biology Industry track at University of Miami is to identify industrial internship opportunity for students. Merck has a tradition of providing internships in our company to undergraduate and graduate students. The proposed program aligns with our mission to serve the community. Industrial internship is an exciting concept and mutually beneficial to students and the company. Typically, our company provides an internship opportunity for students for 2-3 months. We are happy to consider the students in your program for an internship opportunity in our company.

Kind regards,

Jennifer E. O'Neil, Ph.D.
Senior Principal Scientist
Oncology Discovery
Merck Research Laboratories
BMB9-120
33 Avenue Louis Pasteur
Boston, MA 02115
Phone: 617-992-2542
Fax: 617-992-2412

Dr. Sapna Deo, PhD

Professor & Graduate Program Director

Department of Biochemistry and Molecular Biology

University of Miami Miller School of Medicine

Email: SDeo@med.miami.edu

Dear Dr. Deo,

It is timely to have the Master's program in Biochemistry and Molecular Biology at University of Miami Miller School of Medicine. An important component of Master's program in Biochemistry and Molecular Biology Industry track at University of Miami is to identify industrial internship opportunity for students. dōTERRA International has a tradition of providing internships in our company to undergraduate and graduate students. The proposed program aligns with our mission to serve the community. Industrial internship is an exciting concept and mutually beneficial to students and the company. Typically, our company provides an internship opportunity for students for 2-3 months. We are happy to consider the students in your program for an internship opportunity in our company.

Kind regards,

Ryan Finch

Director, Research and Development

dōTERRA International

389 S. 1300 W.

Pleasant Grove, UT 84062

BUDGET

Program Revenue for MS in Biochemistry & Molecular Biology

The courses require full participation of the instructor similar to a traditional classroom setting. Further, BMB faculty will be the research mentors of the MS students. The tuition for the MS program will be a fixed cost of $41,500. We do not plan to hire any new faculty for the MS program. All courses will be taught by existing faculty, however, we have assigned percent effort for each course taught as per the new faculty compensation plan of the Medical School. Seven new courses will be developed as part of the MS degree. The budget includes cost associated with teaching all courses in the program whether new or existing.

Appendix 1.

BMB Course Description

BMB 701 - Journal Club - (Fall & Spring Semesters; 1 Credit, Dr. Sapna Deo): All MS students must participate in the BMB Journal Club course. In this course, predoctoral trainees are required to critically review published paper(s) of their choice in the BMB topic area in Fall semester and present their research findings in Spring semester. The MS students will participate in this course and will write summary of the presentation.

Ethics, RCR, Professional Skills Workshop (1 credit, Dr. Zafar Nawaz)
In this course, ethical case studies are discussed, and an introduction to laboratory management is provided. Short lectures and discussion are conducted to provide students with the ability to tackle dilemmas and pitfalls associated with the responsible conduct of research. Information is provided on regulatory requirements of conducting research, including safety issues and the use of humans, animals, and radioactive/bio hazardous material. The obligations of scientists with respect to public policy and advocacy are also discussed. In addition, students will participate in an online RCR training course (RST-401/501/601 sections) offered by the Collaborative Institutional Training Initiative (CITI) Program at UM. A CITI Program RCR course typically requires around 4 hours to complete. The students receive an "S" (satisfactory) grade for a CITI RCR course after the completion of the online module. This online training course will serve as yearly continuation of RCR training after completion of the Research Ethics course. Additionally, every semester faculty in the department present a seminar related to topics in research ethics. Students also attend an online training in RCR. Several professional skills workshop such as grant writing workshop, career workshops, and seminars by professional scientists related to career are organized by the BMB department as well as the Office of Graduate studies. Students will attend these series of events.

BMB705-Principles of Biochemistry (3 credits, Dr. T. K. Harris): This course is divided into three parts. **Part 1**, examine the biochemical composition and structure of the four basic types of biological macromolecules: (i) carbohydrates, (ii) nucleic acids, (iii) proteins, and (iv) lipids. In addition, students will learn the composition and function of dietary nutrients and vitamins. **Part 2**, study how genetic information flows from its storage as DNA sequence to its expression as functional RNA and protein molecules. A particular emphasis will be towards understanding control of gene expression by various epigenetic and signaling mechanisms. **Part 3**, learn how metabolic pathways are used to convert food molecules into energy and chemical intermediates used for biosynthesis of our own cellular materials.

BMB714 Molecular Genetics (3 credits, Dr. Rick Myers): There are 4 major sub-disciplines of genetics. This course will focus on the first three and leave assessment of quantitative traits as needed for students work. The sub-disciplines include, 1. transmission genetics: basic principles of genetics and how traits are passed from one generation to the next, 2. Molecular genetics: the chemical nature of genes and genomes; how genetic information is encoded, replicated, and expressed. It includes the cellular processes of replication, transcription, and translation - by which genetic information is transferred from one molecule to another – and gene regulation - the processes that control the expression of genetic information, 3. population genetics: the genetic composition of groups of individual members of the same species and how that composition changes over time and geographic space, and 4. quantitative genetics: deals with phenotypes that vary continuously (in characters such as height or mass) – as opposed to discretely identifiable phenotypes and gene-products (such as eye color, or the presence of a particular biochemical).

BMB 745-Current Topics in BMB (3 credits, Dr. Sapna Deo): In this course students will attend series of lectures by BMB faculty and experts who will discuss state of the art in biotechnology industry and BMB research. Talks will be presented to cover different topics and research areas in BMB and new upcoming areas of research in BMB. Students will attend this course and will write a summary of each presentation as part of the requirement.

BMB 740-I and II Biotechniques Course I and II (3 credits, Dr. Yanbin Zhang and Dr. Zafar Nawaz): Students will be introduced to variety of techniques used in biotechnology research. The course will be a combination of lectures and hands-on technique experience. The course will teach students both traditional and new techniques used in BMB.

Below are a few examples of Elective courses available in BMB

1. **BMB710. Nanomedicine (3 credits, Dr. Shanta Dhar and Dr. Sapna Deo).** This is a special-topics course for graduate students and advanced undergraduate students. This course will focus on nanotechnology and its applications in medicine. This course offers an introductory concept of an interdisciplinary field of nanotechnology for students with physical, chemical, biological, medical, and engineering background. This course will be focused on nanomaterials, engineering of nanomaterials, cellular and intracellular interactions of nanoparticles, nanotechnology-based drug delivery systems, nano-based diagnosis, nanotoxicology, and clinical translational aspects of nanomedicines. Unique properties, which are offered by the materials at the nanoscale, will be discussed. Nanotechnology in sensing and diagnostics will be discussed. The topics to be discussed are of considerable interest across a broad range of areas in medicine, chemistry, biology, physics, pharmacy, medicine, mathematics, and engineering.
2. **BMB 715 Structural Biology and Applications to Drug Discovery (3 credits, Dr. Arun Malhotra)** - This course provides an introduction to structural biology and illustrates how understanding the relationship between structure and function of biological macromolecules drives drug discovery. The course will be in three parts, with the first covering experimental and computational tools of structural biology – X-ray crystallography, cryo-electron microscopy and molecular modeling. The second part of the course will look at examples where structural biology has influenced drug design. The final part of this course will look at structures of nucleic acid (DNA and RNA) binding proteins and how they inform drug discovery.
3. **BMB710 Cancer Signaling (3 credits, Drs. Mingjian Xu and Dr. Fengchun Yang).** This is a didactic lecture series in which general concepts in Cancer Signaling will be reviewed. Topics range from cancer signaling, genetics (oncogene and tumor suppressors) and epigenetics to novel concepts such as non-coding RNAs, cancer stem cells and therapeutic approaches. This course is designed for graduate students and researches who would like to develop an understanding of cancer and how it is developed and investigated. The course introduces the basis of cancer signaling, cancer genetics (oncogenes and tumor suppressor genes) and cancer epigenetics, as well as the biologic hallmarks of cancer. The course also describes the critical cancer signaling pathways that lead to various cancers such as breast cancer, colon cancer, and acute myeloid leukemia. In addition to the core materials, this course includes lectures devoted to non-coding RNAs and cancers as well as the development of novel therapeutics for cancer.

BMB 830-1 Research course (15 credits, Dr. Feng Gong) This will form the most significant portion of the MS student's degree program. Students will perform research with a mentor that they choose depending upon their research interest (see Appendix A for the list of BMB graduate program faculty). A committee consisting of 3 faculty from the graduate program will be formed to evaluate student for the final oral comprehensive examination. The final oral exam will be scheduled in the last semester of the study. This oral comprehensive exam will involve the review of all experimental data and the entire presentation. During the examination, the mentor is responsible for allotting appropriate time for questions by all participants. Students are expected to understand the significance of their findings,

display adequate knowledge of the relevant literature and know the theory and limitations of methods employed. Students must demonstrate the ability to independently design, execute and interpret original experiments. This group will make a decision to pass or fail a student's oral comprehensive exam.

BMB32- Internship (9 credits, Dr. Feng Gong) Through this course students in the industrial track will participte in an internship in industry. Dr. Gong will help in identifying internship opportunity for students and monitor their progress.

BMB833- Capstone(3 credit, Dr. Feng Gong) Here students will learn how to prepare presentation and write reports and publications. Students will learn about the latest in biochemistry field and upcoming topics of interest to the field to help them prepare for their careers. Students will write a report-based on the industrial internship. They will also prepare a presentation about the work performed. Dr. Gong will guide in writing the report and presentation.

BUDGET

Program Revenue for MS in Biochemistry & Molecular Biology

The courses require full participation of the instructor similar to a traditional classroom setting. Further, BMB faculty will be the research mentors of the MS students. The tuition for the MS program will be a fixed cost of $41,500. We do not plan to hire any new faculty for the MS program. All courses will be taught by existing faculty, however, we have assigned percent effort for each course taught as per the new faculty compensation plan of the Medical School. Seven new courses will be developed as part of the MS degree. The budget includes cost associated with teaching all courses in the program

This information has been redacted.

Please contact the Faculty Senate office for more information: FacSen@miami.edu

Appendix 3

CURRICULUM VITAE
SAPNA K. DEO

1. *Last CV Date Confirmed:* August 22, 2018

I. Personal

2. *Name:* Sapna K. Deo

3. *Home Phone:* (305) 809-8036

3A. *Office Phone:* (305) 243-4421

4. *Email:* sdeo@miami.edu

5. *Address:* 1011 NW 15th street, 239 DB, Gautier building Miami, Florida

6. *Current Academic Rank:* Professor

6A. *Current Track of Appointment:* Tenure

7. *Primary Department:* Biochemistry & Molecular Biology

8. *Secondary or Joint Appointment:*

9. *Citizenship:* Naturalized Citizen (United States of America)

10. *Visa Type:*

II. Higher Education

11. *Institutional*

University of Kentucky, Lexington, Ky, PhD, Chemistry. (2000)

12. *Non-Institutional*

13. *Certification and Licensure*

III. Experience

14. *Academic*

University of Miami, Department of Biochemistry and Molecular Biology, Professor. (2018 - present)

University of Miami, Department of Biochemistry and Molecular Biology, Associate Professor. (2010 - 2018)

Indiana University -Purdue University Indianapolis, Department of Chemistry and Chemical Biology, Associate Professor. (2010)

Indiana University -Purdue University Indianapolis, Department of Chemistry and Chemical Biology, Assistant Professor. (2005 - 2010)

University of Kentucky, Department of Chemistry, Assistant Research Professor. (2002 - 2005)

15. *Hospital Appointments*

16. *Non-Academic*

17. *Military*

IV. Publications

18. *Books and Monographs Published*

Books

Book Chapters

1. Doleman, L., Bachas-Daunert, S., Davies, L., **Deo, S. K.**, Daunert, S. Photoproteins and Instrumentation: Their Availability and Applications in Bioanalysis. *Photoproteins in Bioanalysis* (pp. 225-234). Wiley-Blackwell. http://dx.doi.org/10.1002/3527609148.ch12
2. Bachas-Daunert, S., Dikici, E., **Deo, S. K.** (2010). Biosensors: Design and Applications. *Encyclopedia of Agricultural, Food, and Biological Engineering, Second Edition* (pp. 1-11). Informa UK Limited. http://dx.doi.org/10.1081/e-eafe2-120043047
3. **Deo, S. K.**, Cissell, K., Goulding, A., Rahimi, Y., Shrestha, S. (2008). Biochemistry, Structure, and Engineering of Red Fluorescent proteins. *Luciferases and Fluorescent Proteins Technology: Principles and Advances in Biotechnology and Bioimaging* (pp. 106-135). Research Signpost press.
4. Kumari, A., Pasini, P., **Deo, S. K.**, Flomenhoft, D., Shashidhar, H., Daunert, S. (2008). Biosensors for Quorum Chemical Signaling Molecules: Implications of Bacterial Communication in Gastrointestinal Disorders. *ACS Symposium Series* (pp. 13-27). American Chemical Society (ACS). http://dx.doi.org/10.1021/bk-2008-0984.ch002
5. Shrestha, S., **Deo, S. K.** (2005). Bioluminescence Resonance Energy Transfer in Bioanalysis. *Photoproteins in Bioanalysis* (pp. 95-111). Wiley-Blackwell. http://dx.doi.org/10.1002/3527609148.ch6
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20. *Other Works, Publications and Abstracts*

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Instructor's Manual

1. **Deo, S. K.** (2009). *Affinity Chromatography module*. Analytical Science Digital Library. www.asdlib.org

Journal Article

1. Broyles, D., **Deo, S. K.** (2011). *Zhiquo Wang and Baofeng Yang: MicroRNA expression detection methods* (4th ed., vol. 399, pp. 1575-1576). Analytical and Bioanalytical Chemistry. http://dx.doi.org/10.1007/s00216-010-4451-8
2. **Deo, S. K.** (2010). *Tadhg P. Begley (Ed.): Wiley encyclopedia of chemical biology, 4 volume set* (7th ed., vol. 396, pp. 2373-2374). Analytical and Bioanalytical Chemistry. http://dx.doi.org/10.1007/s00216-010-3473-6
3. **Deo, S. K.** (2008). *Jacquie T. Keer and Lyndsey Birch (Eds.): Essentials of nucleic acid analysis. A robust approach* (3rd ed., vol. 392, pp. 321-322). Analytical and Bioanalytical Chemistry. http://dx.doi.org/10.1007/s00216-008-2268-5
4. **Deo, S. K.** (2007). *P. F. Predki (Ed.): Functional protein microarrays in drug discovery* (6th ed., vol. 389, pp. 1655-1656). Analytical and Bioanalytical Chemistry. http://dx.doi.org/10.1007/s00216-007-1590-7
5. **Deo, S. K.** (2007). *P. F. Predki (Ed.): Functional protein microarrays in drug discovery* (6th ed., vol. 389, pp. 1655-1656). Analytical and Bioanalytical Chemistry. http://dx.doi.org/10.1007/s00216-007-1590-7
6. Daunert, S., **Deo, S. K.**, Hamase, K., Vogel, M. (2006). *Meet the Guest Editors* (3rd ed., vol. 386, pp. 403-404). Analytical and Bioanalytical Chemistry. http://dx.doi.org/10.1007/s00216-006-0750-5
7. **Deo, S. K.**, Daunert, S. (2006). *Quo vadis? Leading the way with the younger generation of scientists* (3rd ed., vol. 386, pp. 401-402). Analytical and Bioanalytical Chemistry. http://dx.doi.org/10.1007/s00216-006-0749-y
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Reference Entry

1. Feliciano, J., Pasini, P., **Deo, S. K.**, Daunert, S. Photoproteins as Reporters in Whole-cell Sensing. *Protein Science Encyclopedia*. Wiley-Blackwell. http://dx.doi.org/10.1002/9783527610754.bt05
2. Rowe, L., Teasley, K., Dikici, E., Qu, X., Ensor, M., **Deo, S. K.**, Daunert, S. Recombinant Aequorin-Based Systems for Biomarker Analysis. *Handbook of Biosensors and Biochips*. Wiley-Blackwell. http://dx.doi.org/10.1002/9780470061565.hbb017

Intellectual Property

1. Daunert, S., Velazquez, O. C., Liu, Z.-J., Deo, S. K., Daftarian, P. "Compositions and Methods for Wound Healing, Angiogenesis, and Diagnostic/Imaging." (Approved: April 2017).
2. Daunert, S., Watkins, D., Magnani, D., Kallas, E., Deo, S. K., Dikici, E. "Zika Virus Antibodies." (Approved: October 29, 2016).
3. Daunert, S., Deo, S. K., Kobetz-Kerman, E. N., Broyles, D., Manfredi, A. "Rapid, Cost-Effective Equipment Free and Portable Paper Strip Tests for Pathogen." (Approved: March 2016).
4. Daunert, S., Dikici, E., Deo, S. K., Narain, N., Daftarian, P., Sarangnathan, R., Vishnudas, V., Jimenez, J. J., Gesta, S., Jing, E. "Enolase 1 (EN01) Compositions and Uses Thereof." (Approved: January 13, 2015).
5. Daunert, S., Daftarian, Deo, S. K., P., Perez, V., Head, T. "Compositions and Methods for in vivo

Imaging of Apoptosis." (Approved: June 10, 2014).

6. Daunert, S., Dikici, E., Deo, S. K., Kaifer, A., Daftarian, P. "Muscle Cell-Targeting Nanoparticles for Vaccination and Nucleic Acid Delivery, and Methods of Production and Use Thereof." (Approved: January 28, 2014).
7. Daunert, S., Dikici, E., Deo, S. K., Daftarian, P. "anoparticle/Bioluminescent Protein Complexes for Targeted Imaging for in vitro and in vivo Applications." (Approved: 2013).
8. Daunert, S., Deo, S. K., Daftarian, P. "Compositions and Methods for a Universal Transfection Vehicles Based on Modified Nanocarriers." (Approved: 2013).
9. Daunert, S., Velazquez, O. C., Liu, Z.-J., Deo, S. K., Daftarian, P. "Compositions and Methods for Wound Healing, Angiogenesis, and Diagnostic/Imaging." (Approved: June 9, 2013).
10. Daunert, S., Pasini, P., Deo, S. K., Date, A. "Spores for the Stabilization and On-Site Application of Bacterial Whole-Cell Biosensing Systems." (Approved: March 2013).
11. Daunert, S., Ehrick, J., Browning, Deo, S. K., T., Bachas, L. G. "Stimuli-Responsive Hydrogel Microdomes Integrated with Genetically Engineered Proteins for High-Throughput Screening of Pharmaceuticals." (Approved: December 9, 2009).
12. Daunert, S., Desai, U., Deo, S. K., Hyland, K., Poon, M. "Method and Kit For Determination of Prostacyclin in Plasma." (Approved: February 9, 2009).
13. Daunert, S., Pasini, P., Deo, S. K., Kumari, A., Raut, N., Flemenhoft, D., Shashidhar, H. "Systems and Methods for Diagnosis and Monitoring of Bacteria-Related Conditions." (Approved: September 10, 2008).
14. Daunert, S., Dikici, E., Deo, S. K., Rowe, L. "Aequorin and Obelin Mutants with Differing Wavelengths and Bioluminescence." (Approved: March 18, 2008).

21. *Other Works, Accepted for Publication*

V. Professional

22. *Funded Research Performed*

Deo, S. K. (Principal Investigator), Daunert, S. (Principal Investigator), "Multiplex detection of bacteria ona paper strip" Sponsored by NIGMS, $1,520,000.00. (Sept 1, 2018 - August 31, 2022).

Deo, S. K. (Co-Investigator), Beurel, E. (Principal Investigator), Daunert, S. (Co-Investigator), "The microbiota, a possible link between Th17 cells and depression," Sponsored by NIMH, $1,108,800.00. (April 1, 2017 - March 31, 2021).

Deo, S. K. (Principal Investigator), Daunert, S. (Co-Investigator), Stone, G. (Co-Investigator), "Viral Persistency detection using bioluminescent stem-loop probes," Sponsored by NIGMS, $1,477,440.00. (June 23, 2015 - June 22, 2020).

Deo, S. K. (Co-Investigator), Daunert, S. (Principal Investigator), Watkins, D. (Co-Investigator), "Antibody-Based Zika Diagnostics," Sponsored by State of Florida, $1,200,000.00. (March 1, 2017 - February 28, 2020).

Deo, S. K. (Co-Investigator), Daunert, S. (Co-Investigator), Dhar, S. (Principal Investigator), Jayaweera, D. T. (Co-Investigator), "Nano-formulations of Anti-helminthic drugs for Zika Therapy and Prevention," Sponsored by State of Florida, $1,200,000.00. (March 1, 2017 - February 28, 2020).

Deo, S. K. (Co-Investigator), Daunert, S. (Principal Investigator), "Protein displayed spores and spore ghosts platforms for detection and biotransformation," Sponsored by The National Science Foundation,

$400,000.00. (June 1, 2015 - May 31, 2018).

Deo, S. K. (Principal Investigator), Daunert, S. (Co-Investigator), "Rapid RNA Test for Zika Virus," Sponsored by State of Florida, $200,000.00. (March 1, 2017 - February 28, 2018).

Deo, S. K. (Co-Investigator), Daunert, S. (Principal Investigator), Belkin, S. (Principal Investigator), Agranat, A. (Co-Investigator), "Remote Long-Lived Sensors for the Detection of Explosives," Sponsored by Government of Israel Ministry of Defense, $240,000.00. (January 15, 2016 - January 14, 2018).

Deo, S. K. (Co-Investigator), Schulman, C. I. (Principal Investigator), Daunert, S. (Co-Investigator), "Sense Drive," Sponsored by BMW, $250,000.00. (February 1, 2014 - December 31, 2017).

Deo, S. K. (Co-Investigator), Kobetz-Kerman, E. N. (Principal Investigator), Daunert, S. (Co-Investigator), "Development of Sensors for Volatile carcinogens," Sponsored by State Florida, $180,000.00. (July 1, 2016 - June 30, 2017).

Deo, S. K. (Principal Investigator), Daunert, S. (Principal Investigator), Kobetz-Kerman, E. N. (Principal Investigator), "A Point-of-Care HPV Test To Screen for Cervical Cancer," Sponsored by University of Miami Wallace H. Coulter Foundation, $125,000.00. (October 1, 2015 - May 31, 2017).

Deo, S. K. (Principal Investigator), Daunert, S. (Principal Investigator), Kobetz-Kerman, E. N. (Principal Investigator), "Validating a rapid HPV test to increase screening intake to reduce cervical cancer disparities," Sponsored by Sylvester Cancer Center University of Miami, $150,000.00. (October 1, 2014 - May 31, 2017).

Deo, S. K. (Principal Investigator), Daunert, S. (Co-Investigator), Stone, G. (Co-Investigator), "Detection of HIV Viral Persistency," Sponsored by State of Florida- CFAR-Pilot, $60,000.00. (January 1, 2015 - December 31, 2016).

Deo, S. K. (Co-Investigator), Daunert, S. (Principal Investigator), Jimenez, J. J. (Co-Investigator), "Biologically Targeted Reformulation Delivery Systems for Novel Berg Investigational Pharmaceuticals," Sponsored by Berg Pharma, $1,152,473.00. (March 1, 2014 - December 31, 2016).

Deo, S. K. (Co-Investigator), Daunert, S. (Principal Investigator), Watkins, D. (Co-Investigator), Barber, G. N. (Co-Investigator), "A simple, inexpensive, and rapid test for dengue virus infection," Sponsored by BioNIUM Pilot Award, $25,000.00. (September 2015 - August 2016).

Deo, S. K. (Co-Investigator), Daunert, S. (Co-Investigator), Bachas, L. G. (Principal Investigator), "Design of a Miniaturized Self-charging Power Sources for Medical Devices," Sponsored by UM-FIU CREF, $25,000.00. (August 1, 2014 - July 30, 2016).

Deo, S. K. (Co-Investigator), Kobetz-Kerman, E. N. (Principal Investigator), Daunert, S. (Co-Investigator), "Scaling an innovative cervical cancer screening intervention within two underserved communities in South Florida," Sponsored by GE Foundation, $209,536.00. (September 1, 2014 - August 31, 2015).

Deo, S. K. (Principal Investigator), Daunert, S. (Principal Investigator), Kobetz-Kerman, E. N. (Principal Investigator), "Development of a rapid screening test for preventing and detecting cervical cancer," Sponsored by University of Miami Women's Cancer Association, $40,000.00. (June 1, 2014 - May 31, 2015).

Deo, S. K. (Co-Investigator), Daunert, S. (Principal Investigator), Jimenez, J. J. (Co-Investigator), "Biologically Targeted Reformulation Delivery Systems for Novel Berg Investigational Pharmaceuticals," Sponsored by Berg Pharma, $1,315,217.00. (March 1, 2013 - February 28, 2014).

Deo, S. K. (Principal Investigator), "Homogenous, rapid, and highly sensitive detection of cellular RNAs," Sponsored by The National Science Foundation, $595,000.00. (March 1, 2008 - February 28, 2013).

Deo, S. K. (Co-Investigator), Daunert, S. (Principal Investigator), "Biomarker and molecular Diagnostics,"

Sponsored by Berg Pharma, $350,000.00. (May 1, 2012 - November 30, 2012).

Deo, S. K. (Mentor to student Eric Hunt who received the fellowship), Hunt, E. (Principal Investigator), "Bioluminescent molecular beacon," Sponsored by The National Science Foundation, $120,000.00. (August 1, 2009 - July 30, 2012).

Deo, S. K. (Co-Investigator), Minto, R. (Principal Investigator), "MRI: Acquisition of a High Resolution LC-MS/MS system," Sponsored by The National Science Foundation, $479,590.00. (January 1, 2008 - December 31, 2010).

Deo, S. K. (Principal Investigator), "Highly sensitive mix-and-measure detection method for microRNAs," Sponsored by NIGMS, $73,896.00. (September 1, 2007 - August 31, 2009).

Deo, S. K. (Co-Investigator), Daunert, S. (Principal Investigator), "Modified Photoproteins as Labels and Molecular Switches in Bioanalysis," Sponsored by NIGMS, $1,750,000.00. (March 1, 2004 - February 28, 2008).

Deo, S. K. (Principal Investigator), "Bioluminescent detection of nucleic acid," Sponsored by IUPUI Research Support Fund, $30,000.00. (January 1, 2007 - December 31, 2007).

Deo, S. K. (Principal Investigator), "Molecular Switches for Functional Screening of Breast cancer protein (BRCA1)," Sponsored by American Cancer Society, $20,000.00. (January 1, 2006 - December 31, 2006).

Deo, S. K. (Co-Investigator), Daunert, S. (Principal Investigator), "Bio-inspired Materials for sensing and actuation in Biomedical Applications," Sponsored by NIBIB, $335,000.00. (September 19, 2003 - August 31, 2005).

Deo, S. K. (Training Core Co-Leader), Bachas, L. G. (Training Core Leader), Hennig, B. (Principal Investigator), "Training Core- Superfund Chemicals:Transport, Metabolism, and Toxicity," Sponsored by NIEHS, $500,000.00. (April 1, 2000 - August 31, 2005).

23. *Editorial Responsibilities*

MD-PhD Research Day, Reviewer/Referee. (2015 - Present).

NIH Study Sections (2012-Present)

Nature Methods, Reviewer/Referee. (2013 - Present).

PLoS, Reviewer/Referee. (2010 - Present).

Molecular Biotechnology, Editorial Review Board Member. (2009 - Present).

Analyst RSC Journal, Reviewer/Referee. (2005 - Present).

Analytica Chimica Acta, Reviewer/Referee. (2005 - Present).

Analytical and Bioanalytical Chemistry Springer Journal, Reviewer/Referee. (2005 - Present).

Ananlytical Biochemistry Scienece Direct Journal, Reviewer/Referee. (2005 - Present).

Ananlytical Chemistry ACS Journal, Reviewer/Referee. (2005 - Present).

Sensors and Actuators B Elsevier Journal, Reviewer/Referee. (2005 - Present).

Talanta, Reviewer/Referee. (2005 - Present).

Trends in Analytical Chemistry, Reviewer/Referee. (2005 - Present).

NSF Study section panel, Reviewer/Referee. (2015).

Dutch Technology Foundation STW, Reviewer/Referee. (2013).

Breman Family Center Grant Funding Review committee, Reviewer/Referee. (2010 - 2013).

NSF Study section panel, Reviewer/Referee. (2012).

The Danish Agency for Science, Technology and Innovation, Reviewer/Referee. (2011).

NSF Study section panel, Reviewer/Referee. (2011).

DCFAR Grant Funding Review committee, Reviewer/Referee. (2010).

US-Civilian Research and Development Foundation (US-CRDF), Reviewer/Referee. (2010).

American Institute of Biological Sciences-Army, Reviewer/Referee. (2009).

Austrian Science Fund, Reviewer/Referee. (2009).

NSF Study section panel, Reviewer/Referee. (2009).

Photoproteins in Bioanalysis, Editor. (2006).

24. *Professional and Honorary Organizations*

American Society for Biochemistry and Molecular Biology, Member. (2015 - Present)

International Society for Bioluminescence & Chemiluminescence, Member. (2015 - Present)

American Chemical Society, Member. (1997 - Present)

American Chemical Society, Analytical Division- Undergraduate Research Award Committee. (2006 - 2009)

25. *Honors and Awards*

Cancer Researchers of the Year, Women's Cancer Association. (2015)

Outstanding Gradaute Program Director, University of Miami. (2014)

J. W. Taylor Travel Award, Association of Midwestern Universities in Analytical Chemistry. (2008)

Outstanding Faculty, Indiana University-Purdue University Indianapolis. (2008)

School of Science Faculty Research Award, Indiana University-Purdue University Indianapolis. (2008)

The National Science Foundation Career Award, The National Science Foundation. (2008)

Faculty Honors Reserach Fellowship, Indiana University-Purdue University Indianapolis. (2007)

Academic Excellence Award, University of Kentucky. (1998)

Predoctoral Fellowship, Kentucky Research Challenge Trust Fund. (1998)

26. *Post-Doctoral Fellowships*

University of Kentucky, Chemistry. (2000 - 2001)

27. *Other Professional Activities*

a. Presentations

Oral Presentation

Invited

Deo, S. K., Bienal 2017, "Nucleic Acid Detection Technologies For Pathogen Monitoring," Royal Society of Chemistry of Spain, Sitges Spain. (June 2017).

Deo, S. K., Health and Innovation: Nanotechnology for Medicine, "BioNano-Enabling Technologies

for Sensing, Delivery, and Imaging," EU Jean Monnet Project, Miami. (June 14, 2017).

Deo, S. K., Batsheva de Rothschild Seminar on New Concepts in Biosensing, "Paper-based Nucleic acid Detection Technologies for Pathogen Monitoring," dead sea, Israel. (February 12, 2017).

Deo, S. K., "Bionanoenabling Technologies for Biosensing and Targeted Delivery," FIU, Department of Biomedical Engineering. (October 26, 2016).

Deo, S. K., Daunert, S., Pancreatic Cancer Symposium, "Bionanotechnology Approaches for Detection and Delivery of Therapeutic Agents," Sylvester Cancer Center, Miami, FL. (June 2016).

Deo, S. K., Gordon Conference, "Engineering and Exploiting Molecular Recognition for Biosensing, Environmental, and Targeted Delivery Applications.," National Science Foundation, Newport, Rhode Island. (June 27, 2016).

Deo, S. K., PITTCON, "Toward onsite nucleic acid detection," PITTCON, Orlando, FL. (March 2015).

Deo, S. K., Pittcon, "Toward onsite nucleic acid detection," New Orleans, LA. (March 13, 2015).

Deo, S. K., "Targeted Molecular Imaging and Drug Delivery Systems, Molecular Imaging Systems," Punjab University, Lahore. (December 22, 2014).

Deo, S. K., "Detecting MicroRNAs: Quantifying an Emerging Biomarker Using Luminescence Technolog," Punjab University, Lahore. (December 20, 2010).

Deo, S. K., 2nd Annual BioNIUM retreat, "Quantum Dot-Luminescent Protein Nanoprobes for Rapid Nucleic Acid Sensing," BioNIUM. (December 9, 2010).

Deo, S. K., "Detecting MicroRNAs: Quantifying an Emerging Biomarker Using Luminescence Technology," Bascom Palmer Eye Institute, University of Miami. (June 26, 2010).

Deo, S. K., "Luminescence–based biosensing," Department of Chemistry, Northern Kentucky University, Department of Chemistry, Northern Kentucky University, Covington, KY. (February 13, 2010).

Deo, S. K., "Luminescence–based sensing of microRNAs," Indiana Clinical and Translational Sciences Institute, Indiana University. (November 6, 2009).

Deo, S. K., "Luminescence–based sensing of microRNAs," University of Cincinnati, Cincinnati. (September 10, 2009).

Deo, S. K., "Luminescent proteins in bioanalysis," Department of Chemistry, Northern Illinois University, DeKalb, IL. (March 16, 2009).

Deo, S. K. (Author & Presenter), Midwestern Universities Analytical Chemistry Conference (MUACC), "Luminescence-based MicroRNA Detection," Midwestern Universities Analytical Chemistry Conference (MUACC), Bloomington, IN. (November 2008).

Deo, S. K., Midwest ACS Meeting, "Bioluminescence-based detection of microRNA," ACS, Bloomigton. IN. (October 2008).

Deo, S. K., Pacifichem Conference, "Photoproteins in bioanalysis," ACS, Honolulu, Hawai. (December 2005).

Non-Invited

Pawley, D. (Author), Goncalves, S., Bas, E., Dikici, E., Nayak, N., Telischi, F. F., **Deo, S. K.**, Daunert, S., ARO, "Development of a Poly(lactic-co-glycolic acid) (PLGA) Microneedles for the Sustained Delivery of Drugs in Cochlea," ARO. (October 2016).

Messiah, S. E., Vidot, D., Spadola, C., Cuesta, M., **Deo, S. K.**, Daunert, S., De La Cruz-Munoz, N.

F., The Obesity Society's Annual Meeting, "Relationship between Duodenum Serotonin and Cortisol and Self-Reported Anxiety and Depression in Ethnically Diverse, Young Adult Weight Loss Surgery Patients," The Obesity Society, New Orleans, LA. (October 2016).

Head, T., Daftarian, P., Victor, P., Dikici, E., Kovalski, L., Tan, Y., Urbeita, M., **Deo, S. K.**, Daunert, S., NanoFlorida, "Combating Cardiovascular Disease: Computational Modeling and Bioluminescence-Based Detection of Atherosclerosis," Nanoflorida, Orlando, FL. (September 2016).

Jativa, S., Thapar, N., **Deo, S. K.**, Tan, Daftarian, P., Daunert, S., NanoFlorida, "Peptide-functionalized PAMAM Dendrimers for Targeted Delivery of DNA Vaccines to Skeletal Muscle Cells," Nanoflorida, Orlando, FL. (September 2016).

Head, T., Dao, P., **Deo, S. K.**, Daunert, S. (Author), NanoFlorida, "A Chimeric Protein Sensor for Bioluminescence-based Apoptosis Detection," NanoFlorida, Miami, FL. (September 2014).

Cissell, K., **Deo, S. K.**, PITTCON, "Bioluminescence resonance energy transfer-based detection of E. coli 16srRNA," PITTCON, Chicago, IL. (March 2009).

Goulding, A., **Deo, S. K.**, PITTCON, "MicroRNA Detection by Renilla Luciferase Protein-Fragment- Complementation Assay," PITTCON, Chicago, IL. (March 2009).

Hunt, E., **Deo, S. K.**, PITTCON, "Quantum dot based detection of cellular ribosomal RNA," PITTCON, Chicago, IL. (March 2009).

Cissell, K., Rahimi, Y., **Deo, S. K.**, PITTCON, "Detection of nucleic acids based on bioluminescence resonance energy transfer between Renilla luciferase and quantum dots," PITTCON, NEw Orleans, LA. (March 2008).

Goulding, A., Rahimi, Y., Shrestha, S., **Deo, S. K.**, PITTCON, "DsRed-based protein labeling system: application in affinity purification and fluorescent analysis," PITTCON, New Orleans, LA. (March 2008).

Cissell, K., Shrestha, S., **Deo, S. K.**, PITTCON, "Design of a Biosensing System Based on an Intrinsically Unstructured Protein as a Biological Recognition Element," PITTCON. (February 2007).

Rahimi, Y., Shrestha, S., Baneerjee, T., **Deo, S. K.**, PITTCON, "Red Fluorescent Protein: Dual Function as a Fluorescent Probe and an Affinity Tag," PITTCON. (February 2007).

Rahimi, Y., **Deo, S. K.**, Yasmeen, "Biosensing applications of red fluorescent protein," Sigma Xi, Indiana University. (March 2006).

Cissell, K., **Deo, S. K.**, Yasmeen, "Development of a Biosensing System Based on Interaction between Intrinsically Unstructured Protein BRCA1 and Tumor suppressor Protein p53," Sigma Xi, Indiana University. (March 2006).

Deo, S. K., Lewis, J., Daunert, S., PITTCON, "Bioluminescence detection of proteolytic bond cleavage by using recombinant aequorin," New Orleans, LA. (March 2000).

Poster

Non-Invited

Baum, J., Santiago, K. M., Dikici, E., Moore, K., Niemczyk, N., Schaefer Solle, N., Sterling, D. A., Lee, J., **Deo, S. K.**, Daunert, S., Kobetz-Kerman, E. N., Caban-Martinez, A. J., American Public Health Association Annual Meeting, "Evaluating Temperature Changes and Volatile Organic Compound Off-Gassing in Turnout Protective Gear Ensembles among Florida Firefighters," American Public Health Association Annual Meeting. (November 4, 2017).

Moutsiopolou, A., Hunt, E., Broyles, D., Woodward, K., Pareira, K., Dikici, E., Daunert, S., Kaifer,

A. E., **Deo, S. K.**, ASBMB Annual Conference, "Bioorthogonal Protein Conjugation: Application for the Development of a Highly Sensitive Bioluminescent Immunoassay for the Detection of Interferon-γ," ASBMB, Chicago, IL. (April 24, 2017).

Broyles, D., **Deo, S. K.**, ASBMB Annual Conference, "Rapid point-of-care RNA test," ASBMB, Chicago, IL. (April 24, 2017).

Jativa, S., Daftarian, P., Daunert, S., Thapar, N., **Deo, S. K.**, Annual meeting of the Society of Controlled Release, "Peptide-functionalized PAMAM Dendrimers for Targeted Delivery of DNA Vaccines to Skeletal Muscle Cells," Society of Controlled Release, Seattle, WA. (July 2016).

Jativa, S., Thapar, N., Daftarian, P., Daunert, S., **Deo, S. K.**, Miami Winter Symposium, "Skeletal muscle binding peptide conjugated dendrimer nanoparticles as a gene delivery platform for anti-inflammatory mediators," Miami, FL. (January 2016).

Jativa, S., Daftarian, P., Daunert, S., **Deo, S. K.**, NanoFlorida, "A Novel Hybrid Vector for the Delivery of DNA Vaccines into Skeletal Muscle Cells," NanoFlorida, Miami, FL. (September 2014).

Wynn, D., Knecht, L., **Deo, S. K.**, Daunert, S., NanoFlorida, "Development of a Paper-Based Assay for Hazardous Pollutants Based on Genetically Engineered Bacterial Cells," NanoFlorida, Miami, FL. (September 2014).

Hunt, E., **Deo, S. K.**, Miami WInter Symposium, "Bioluminescent stem-loop probes: novel molecular beacons", Miami Winter Symposium," BMB-Elsevier, Miami, FL. (February 2011).

Broyles, D., Cissell, K., Rice, M., **Deo, S. K.**, Miami Winter Symposium, "Luminescence-based detection of miRNA biomarkers," BMB-Elsevier, Miami, FL. (February 2011).

Kumar, M., Broyles, D., Zhang, D., **Deo, S. K.**, University of Miami, 2nd Annual BioNIUM retreat, "Modified quantum dots for application in bioluminescence resonance energy transfer-based nucleic acid sensing," University of Miami,, Miami, FL. (December 2010).

Hunt, E., **Deo, S. K.**, University of Miami, 2nd Annual BioNIUM retreat, "Novel bioluminescent molecular beacons," University of Miami,, Miami, FL. (December 2010).

Hunt, E., Cissell, K., **Deo, S. K.**, Midwest ACS Meeting, "Bioluminescence-based detection of microRNA, miR21 in breast cancer cells," ACS, Ball State University. (October 2008).

Goulding, A., Rahimi, Y., Shrestha, S., **Deo, S. K.**, Midwest ACS Meeting, "DsRed-based protein labeling system: application in affinity purification and fluorescent analysis," ACS, Ball State University. (October 2008).

Goulding, A., Rahimi, Y., Shrestha, S., **Deo, S. K.**, Midwest ACS Meeting, "DsRed-based protein labeling system: application in affinity purification and fluorescent analysis," ACS, Ball State University. (October 2008).

Cissell, K., Campbell, S., **Deo, S. K.**, Midwest ACS Meeting, "Nucleic Acid Detection Based on Bioluminescence Resonance Energy Transfer Between Renilla Luciferase and Quantum Dots," ACS, Ball State University. (October 2008).

Kroodsma, D., **Deo, S. K.**, McNair Program, "Development of a Biosensing System Based on the Intrinsically Unstructured Protein BRCA1," NSF, University of Illinois. (July 2008).

Shrestha, S., Rahimi, Y., Goulding, A., **Deo, S. K.**, Midwest ACS Meeting, "DsRed-Monomer as Bifunctional Tag," ACS, Eli Lilly, IN. (October 2007).

Deo, S. K., Cissell, K., Shrestha, S., Midwest ACS Meeting, "microRNA Detection Based on Protein Reassembly," ACS, Eli Lilly, IN. (October 2007).

Hunt, E., Rahimi, Y., Banerjee, T., Shrestha, S., **Deo, S. K.**, Midwest ACS Meeting, "Reagentless

Biosensing of copper based on a far-red fluorescent protein, HcRed," ACS, Eli Lilly, IN. (October 2007).

Rahimi, Y., Goulding, A., Shrestha, S., **Deo, S. K.**, 234th ACS National Meeting, "DsRed-Monomer as Bifunctional Tag," ACS, Boston MA. (September 2007).

Cissell, K., Shrestha, S., **Deo, S. K.**, 234th ACS National Meeting, "microRNA Detection Based on Protein Reassembly," ACS, Boston, MA. (September 2007).

Shrestha, S., Goulding, A., **Deo, S. K.**, In Vitro Biology Meeting, "Spectral Evaluation of Red Fluorescent Protein Variants." (June 2007).

Hunt, E., Shrestha, S., Rahimi, Y., Banerjee, T., **Deo, S. K.**, Central Region ACS Meeting, "Reagentless Biosensing of copper based on a far-red fluorescent protein, HcRed," ACS, Covington, KY. (May 2007).

Hunt, E., Shrestha, S., Goulding, A., **Deo, S. K.**, Central Region ACS Meeting, "Variants of DsRed-monomer with Differing Emission Wavelengths," ACS, Covington, KY. (May 2007).

Shrestha, S., Goulding, A., **Deo, S. K.**, 232nd ACS National Meeting, "Biochemical Characteristics of Red Fluorescent Protein Variants with Incorporated Non-natural Amino Acid Analogues," ACS, San Franscico, CA. (September 2006).

Kumari, A., Pasini, P., **Deo, S. K.**, Flomenhoft, D., Shashidhar, H., Daunert, S., 232nd ACS National Meeting, "Biosensing Systems for the Detection of Bacterial Quorum Signaling Molecules," ACS, San Franscico, CA. (September 2006).

Shrestha, S., Baneerjee, T., Rahimi, Y., **Deo, S. K.**, 232nd ACS National Meeting, "Mapping of Loops in Red Fluorescent Protein for Application in Single-Step Assays," ACS, San Franscico, CA. (September 2006).

Ehrick, J., Bachas-Daunert, S., Stokes, S., Moschou, E., **Deo, S. K.**, Bachas, L. G., Daunert, S., 232nd ACS National Meeting, "Stimuli-responsive hydrogels based on hinge motion binding proteins as recognition elements," ACS, San Franscico, CA. (September 2006).

Baneerjee, T., **Deo, S. K.**, IUPUI Undergraduate Research Symposium,, "Expression, purification and metal binding studies of dimeric red fluorescent protein, HcRed," IUPUI, IUPUI. (July 2006).

Kroodsma, D., Cissell, K., Shrestha, S., **Deo, S. K.**, The Analytical Science Digital Library, "Development of a Biosensing System Based on the Intrinsically Unstructured Protein BRCA1," NSF, Online. (June 2006).

Rowe, L., Teasley, K., Ensor, C. M., **Deo, S. K.**, Daunert, S., 14th ISBC Meeting, "Molecular tuning of aequorin for bioanalytical applications," ISBC, San Diego, CA. (October 2005).

Shrestha, S., Rahimi, Y., Baneerjee, T., Goulding, A., **Deo, S. K.**, 14th ISBC Meeting, "Molecular tuning of aequorin for bioanalytical applications," ISBC, San Diego, CA. (October 2005).

Cissell, K., Goulding, A., Baneerjee, T., **Deo, S. K.**, ACS Local conference, "Red fluorescent protein in bioanalysis," Dow Agrosciences, Dow Agrosciences. (October 2005).

ehrick, J., Luckett, M., **Deo, S. K.**, Bachas, L. G., Daunert, S., 228th ACS National Meeting, "Dimeric Protein Integrated Stimuli-Responsive Hydrogels for Biomedical and Sensing Applications," ACS, San Diego, CA. (March 2005).

Sharma, B., Gass, A., **Deo, S. K.**, Bachas, L. G., Daunert, S., 228th ACS National Meeting, "Monitoring interactions of calmodulin with target peptides using fluorescence resonance energy transfer," ACS, San Diego, CA. (March 2005).

Kumari, A., Pasini, P., **Deo, S. K.**, Flomenhoft, D., Shashidhar, H., Daunert, S., 228th ACS National

Meeting, "Non-invasive biosensor for self-management of Crohn's disease," ACS, San Diego, CA. (March 2005).

Rowe, L., Dikici, E., Logue, C., Scott, D., **Deo, S. K.**, Bachas, L. G., Daunert, S., 228th ACS National Meeting, "Spectral tuning of the bioluminescent photoprotein Aequorin," ACS, San Diego, CA. (March 2005).

Ehrick, J., Browning, T., **Deo, S. K.**, Bachas, L. G., Daunert, S., 227th ACS National Meeting, "Stimuli-Sensitive Hydrogel Microspots for Sensing and High-Throughput Drug Screening," ACS, Anaheim, CA. (March 2004).

Dikici, E., Rothert, A., Puckett, L., Millner, L., **Deo, S. K.**, Madou, M., Daunert, S., SERMACS, "Adaptation of a Whole-Cell Based Reporter Gene Assay for Arsenite and Antimonite to a Compact Disc Centrifugal Microfluidics Platform," SERMACS, Atlanta, GA. (November 2003).

Rothert, A., **Deo, S. K.**, Puckett, L., Feliciano, J., Millner, L., Van Der Meer, J. R., Madou, M., Daunert, S., Superfund Basic Research Program Annual Meeting, "Bacterial biosensing systems for arsenic detection: from the laboratory to the field," NIEHS, Hanover, NH. (November 2003).

Xu, S., Ghosh, D., Feliciano, J., **Deo, S. K.**, D'Angelo, E., Daunert, S., Superfund Basic Research Program Annual Meeting, "Development of a whole-cell sensing system for PCBs detection" Superfund Basic Research Program," NIEHS, Hanover, NH. (November 2003).

Sharma, B., **Deo, S. K.**, Bachas, L. G., Daunert, S., AAPS Meeting, "Multiple Platform Evaluation of a Calmodulin-Based Fluorescence Resonance Energy Transfer Screening Assay," AAPS, Salt Lake City, Utah. (October 2003).

Ehrick, J., **Deo, S. K.**, Bachas, L. G., Daunert, S., Bioengineering and Biochemistry Group (BBG) Research Symposium,, "Stimuli-Responsive Hydrogels with Integrated Protein Recognition for Sensing Applications," Tarrgona, Spain. (July 2003).

Ehrick, J., **Deo, S. K.**, Bachas, L. G., Daunert, S., International Symposium on Sensor Science, "Stimuli-Responsive Hydrogels with Integrated Protein Recognition for Sensing Applications," Paris, France. (June 2003).

Sharma, B., **Deo, S. K.**, Bachas, L. G., Daunert, S., Drug Discovery Technology, "Class-Selective Drug Screening Assay Using Fluorescence Resonance Energy Transfer between a Fluorescently Labeled Calmodulin and 2,6-Anilino-napthalene Sulfonate," Stuttgart, Germany. (April 2003).

Ehrick, J., **Deo, S. K.**, Bachas, L. G., Daunert, S., 225th ACS National Meeting, "Stimuli-Responsive Hydrogels with Integrated Protein Recognition for Sensing Applications," ACS, New Orleans. (March 2003).

Dikici, E., **Deo, S. K.**, Daunert, S. (Author), 225th ACS National Meeting, "Whole-Cell Based Assay for the High-Throughput Screening of Calmodulin Antagonists," ACS, New Orleans, LA, (March 2003).

Ehrick, J., **Deo, S. K.**, Madou, M., Bachas, L. G., Daunert, S., 2nd Annual BioMEMS and Biomedical Nanotechnology World, "Reversibly responsive protein-immobilized hydrogels for controlled release," Columbus, OH. (September 2002).

Ehrick, J., **Deo, S. K.**, Bachas, L. G., Daunert, S., Ninth International Meeting on Chemical Sensors, "Reversibly Responsive Protein-Immobilized Hydrogel Microactuators," Boston, MA. (July 2002).

Ehrick, J., **Deo, S. K.**, Bachas, L. G., Daunert, S., The Seventh World Congress on Biosensors, "Integrated Protein Recognition within Hydrogels for Responsive Microactuators," Kyoto, Japan. (May 2002).

Shrestha, S., Paeng, I., **Deo, S. K.**, Daunert, S., 221st ACS National Meeting, "Cysteine-free mutant

of aequorin: Application in the development of bioluminescence-based immunoassay for digoxin," ACS, San Diego, CA. (March 2001).

Douglass, P., **Deo, S. K.**, Ehrick, J., Ensor, C., Madou, M., Daunert, S., 221st ACS National Meeting, "Development of an assay for 6-keto PGF1α employing 15-hydroxyprostaglandin dehydrogenase: Sensing prostacyclin in physiological fluids," ACS, San Diego, CA. (March 2001).

Desai, U., **Deo, S. K.**, Poon, M., Daunert, S., 221st ACS National Meeting, "Quantitative detection of prostacyclin through a sensitive, bioluminescent immunoassay," ACS, San Diego, CA. (March 2001).

Deo, S. K., Dikici, E., Daunert, S., 221st ACS National Meeting, "Rational design of a fusion protein for the detection of calcium and calmodulin antagonists," ACS, San Diego, CA. (March 2001).

Deo, S. K., Lewis, J., Daunert, S., Regional ACS National Meeting, "C-terminal aequorin modification: applications in binding assays," Covington, KY. (May 2000).

Deo, S. K., Lewis, J., Daunert, S., 219th ACS National Meeting, "Immunoassay for a peptide using a C-terminal aequorin fusion protein: advantages in bioanalysis," San Francisco, CA. (March 2000).

Deo, S. K., Lewis, J., Daunert, S., Life Science Day, "Bioluminescence detection of proteolytic bond cleavage by using recombinant aequorin," University of Kentucky. (November 1999).

Deo, S. K., Lewis, J., Daunert, S., 217th ACS National Meeting, "Assay for HIV-1 protease using recombinant aequorin as a label," ACS, Anaheim, CA. (March 1999).

b. Media

Internet

NIH Series "The Future Heroes of Medical Research", David Broyles, a graduate student in the Deo Group featured in the NIH Series "The Future Heroes of Medical Research" http://www.labtv.com/Home/Profile?researcherId=1410. (July 2015)

NIH Series "The Future Heroes of Medical Research", Samuel Jativa, a graduate student in the Deo Group featured in the NIH Series "The Future Heroes of Medical Research" http://www.labtv.com/Home/Profile?researcherId=1410. (July 2015)

American Chemical Society, Deo Research group work highlighted on the Bioconjugate Chemistry webpage. (June 2009)

Magazine

The National Science Foundation, Dr. Daunert, Dr. Deo and graduate students Daniel Wynn, Xavier Prado featured in the NSF (National Science Foundation) website during the National Chemistry Week. http://nationalsciencefoundation.tumblr.com/post/151972875858/from-the-desk-of-avogadro-mole-i-was-on-my- annual. (October 18, 2016)

Analytical and Bioanalytical Chemistry Springer Journal, Feature Cover of Analytical and Bioanalytical Chemistry "Young Investigators Issue", "Probing a Myth: Does the Younger Generation of Scientists have it easier?". (June 2012)

Analytical and Bioanalytical Chemistry Springer Journal, Feature Cover of Analytical and Bioanalytical Chemistry "Genetically modified foods". (October 2008)

American Chemical Society, Deo Research group work highlighted in the ACS journals "Spotlight on miRNA". (April 1, 2008)

Newspaper

UM Medical School e-update newsletter, Drs. Deo, Daunert, and Kobetz featured in UM's e-update newsletter "Cancer Researchers of the Year Award", http://med.miami.edu/news/faculty-honored-with-womens-cancer-association-researcher-of-the-year-award. (March 10, 2015)

E-Veritas, Drs. Deo, Daunert, and Zafar featured in featured on E-veritas University of Miami, "First Online Industrial PhD Program Launched by the Department of Biochemistry and Molecular Biology" http://everitas.univmiami.net/2013/07/11/first-online-industrial-ph-d-program-launched-by-department-biochemistry-and-molecular-biology/. (July 11, 2013)

TV

Local ABC News, http://www.local10.com/health/zika-virus/um-researchers-work-on-zika-virus-vaccine. (September 23, 2016)

c. Faculty Development

d. Others

Special Issue on "Environmental analytical chemistry"in "Journal of Chemistry, Guest Editor. (2017 - Present)

Special Issue on "New Investigators"in "Analytical & Bioanalytical Chemistry, Guest Editor. (2016)

Special Issue on "RNA Detection Technologies"in "Analytical & Bioanalytical Chemistry, Guest Editor. (2009)

Junior Faculty Forum Butler University, Panel Member. (2009)

Special Issue on "Genetically Modified Foods"in "Analytical & Bioanalytical Chemistry, Guest Editor. (2008)

VI. Teaching

28. *Teaching Awards Received*

Trustees Teaching Award, Indiana University. (2010)

29. *Teaching Specialization*

Certification. (2011 - Present)
Molecular Medicine Pathway

BMB 710-1: Advanced Topics in Biochemistry & Molecular Biology. (Fall 2010, 2014, 2016, 2017)

BMB 702-1: Biochemical Science Seminar. (Fall 2015, 2016, 2017)

BMB 830-1: Doctoral Dissertation. (Fall 2012, 2013, 2014, 2015, 2016, 2017)

BMB 840-1: Doctoral Dissertation- Post Candidacy. (Fall 2012, 2013, 2014, 2015, 2016, 2017)

BMB 850-1: Research In Residence. (Fall 2012, 2013, 2014, 2015, 2016, 2017)

BMB 701-1: Research Journal Club. (Fall 2012, 2013, 2014, 2015, 2016, 2017)

BMB 731-1: Special Work. (Fall 2014, 2015, 2016, 2017)

BMB 702-1: Biochemical Science Seminar. (Spring 2016, 2017)

BMB 830-1: Doctoral Dissertation. (Spring 2013, 2014, 2015, 2016, 2017)

BMB 840-1: Doctoral Dissertation- Post Candidacy. (Spring 2013, 2014, 2015, 2016, 2017)

BMB 810-1: Master's Thesis. (Spring 2017)

BMB 850-1: Research In Residence. (Spring 2013, 2014, 2015, 2016, 2017)

BMB 701-1: Research Journal Club. (Spring 2013, 2014, 2015, 2016, 2017)

BMB 830-1: Doctoral Dissertation. (Summer 2013, 2014, 2015, 2016, 2017)

BMB 840-1: Doctoral Dissertation- Post Candidacy. (Summer 2009, 2013, 2014, 2015, 2016, 2017)

BMB 850-1: Research In Residence. (Summer 2013, 2014, 2015, 2016, 2017)

BMB 810-1: Master's Thesis. (Fall 2012, 2014, 2015)

BMB 610-1: Advanced Topics in Biochemistry & Molecular Biology. (Spring 2012, 2014, 2015)

BMB 631-1: Special Work. (Spring 2015)

BMB 710-1: Master's Thesis. (Summer 2013, 2014, 2015)

G 614: Advanced Biomolecular Imaging I. Indiana University-Purdue University Indianapolis. (2009)

Chem 310: Quantitative Analytical Chemistry. Indiana University-Purdue University Indianapolis. (2009)

Chem 410: Principles of Chemical Instrumentation. Indiana University-Purdue University Indianapolis. (2008)

Chem 610: Advanced Analytical Chemistry. Indiana University-Purdue University Indianapolis. (2007)

Chem 410: Principles of Chemical Instrumentation. Indiana University-Purdue University Indianapolis. (2007)

Chem 610: Advanced Analytical Chemistry. Indiana University-Purdue University Indianapolis. (2006)

Chem 410: Principles of Chemical Instrumentation. Indiana University-Purdue University Indianapolis. (2006)

Chem 410: Principles of Chemical Instrumentation. Indiana University-Purdue University Indianapolis. (2005)

30. *Thesis and Dissertation Advising/Post-doctoral Student Supervision*

Dissertation Advisor

Advised: Chittvan Killawala
Portable device for pathogen detection, 2016 - Present

Advised: Angeliki Moutsiopolou
Bioluminescent stem-loop probes, 2014 - Present

Advised: David Broyles
Development of inexpensive nucleic acid sensing for clinical applications., 2010 - Present

Advised: Samuel Jativa
Targeted Vaccine development, 2013 - 2017

Advised: Daohong Zhang
Multiplex RNA analysis, 2010 - 2015

Advised: Eric Hunt
Design and Development of bioluminescent molecular beacons, 2010 - 2015

Advised: Leticia Kovalski
Imaging with photoproteins, 2010 - 2013

Advised: Ashley Melchior
Targeted Lung imaging and drug delivery, 2010 - 2012

Advised: Ann Goulding
ed fluorescent protein as bifunctional fusion tag., 2005 - 2010

Advised: Kyle Cissell
MicroRNA detection methods, 2005 - 2010

Advised: Christina Sorgen
Hybridization based detection of multiple RNAs, 2006 - 2008

Advised: Jennifer Purdie
Detection of zinc, 2005 - 2007

Advised: Yasmeen Rahimi
Copper binding characteristics of red fluorescent protein, 2005 - 2007

Advised: Yusuf Essix
Hybridization based detection of multiple RNAs, 2005 - 2007

Dissertation Committee Chair

Advised: Trajen Head, Gregory O'Connor, Daniel Wynn, Yu-Ping Yang
2010 - Present

Advised: Sichen Liu
2010 - 2014

Dissertation Committee Member

Advised: Derik Madorma
2016 - Present

Advised: Josh Poorbaugh
2016 - Present

Advised: Devon Pawley, Xavi Prado, Elisabeth Jeffrey
2015 - Present

Advised: Lilly Liu
2014 - Present

Advised: Jennifer Veriotto
2014 - 2017

Advised: Vikas Bhat
2010 - 2013

Advised: Elisa Liszewski, Scott Woodward
2007 - 2009

Advised: Amanda Siegel
2005 - 2009

Advised: Amada Zins, Joe Labuda, Julie Lesniak, Lillyvet Rivas
2005 - 2007

Dissertation Defense Committee Member

Advised: Kristen Grinstead
2016

Advised: Leslie Knecht
2015

Advised: Roya Fatemi
2015

Doctoral Advisory Committee Member

Advised: Yuan Cheng
2012 - 2015

Advised: Kimberly Downy
2014

Advised: Genea Edwards
2012 - 2014

Advised: Keryn Hughes
2012 - 2013

Graduate Student Advisor

Advised: Jeremy Baum
2014 - Present

Advised: Brett Schuchardt
2012 - 2014

Master's Thesis Committee Chair

Advised: Nelson Salgado
2014 - 2016

Postdoctoral Advisor

Advised: Hamdi Joda
2016 - Present

Advised: Manoj Kumar
2009 - 2014

Advised: Suresh Shrestha
2005 - 2006

Postdoctoral Research Supervision

Advised: Suzana Hamdan
2016 - Present

Advised: Smita Joel
2013 - 2016

Supervised Research

Advised: Vasanti Jhaveri, Rahul Gupta, Rachel Cubilla, Daphne Eckembrecher
2015 - Present

Advised: Chitra Gotluru, Cherif Boubacar, Francelia Eckembrecher, Christie Pereira
2016

Advised: Rose Adme, Juan Diaz
2015

Advised: Atif Shah
2012 - 2015

Advised: Neelanshu Thapar

2012 - 2015

Advised: Ananth Asthana, Eleni Katsouli, Nina Pakzad
2014

Advised: Saadiqah Jackson, Gianfranco Chacon, Sabine Jocelin
2014
High School student

Advised: Gabriela Muniz, Hanna Montague
2012 - 2014
High School student

Advised: Jacob Erickson
2011 - 2014

Advised: Kamila Ziodeen, Brian Wasserman, Matthew Varghese, Daniel Vo, Roger Nehaul, Michael Schoor
2011 - 2014

Advised: Nawal Nawaz, Helen Formoso-Murias, Hanna Zosman
2013
High School student

Advised: Gabrielle Paul
2012

Advised: Chris Signoni
2011

Advised: Spencer Romstadt, Avneet Kaur, Fatumoto Bah, Elizabeth Harris, Lavonne Armes
2010

Advised: Amber Ault, Eric Hunt, Shariat Mehrdad, David Broyles, Sean Campbell
2009

Advised: Anurag Bhattarai, Angela Ma, Rizma Shrestha
2007
High School student

Advised: Michael Ashmore
2006
High School student

Advised: Tanushree Banerjee, Derrick Kroodsma, Sweetie Mirpuri
2006

Undergraduate Honors Thesis

Advised: Kristen Woodward
2013 - 2015

Advised: Stephanie Ioannou
2013 - 2015

Advised: Nisreen Ezuddin
2011

VII. Service

31. *University Committee and Administrative Responsibilities*

Member, MS in Nanotechnology Committee. (2016 - Present).

Member, NSF Career Award Workshop Committee. (2016 - Present).

Member, BMB Graduate Program Admission and Recruitment Committee. (2015 - Present).

Member, BMB Graduate Program Curriculum Committee. (2015 - Present).

Committee Member, MS in Clinical Translational Steering Committee. (2015 - Present).

Committee Member, Uniform Guidelines Ad-hoc committee. (2014 - Present).

Director, BioNIUM Education Resource. (2013 - Present).

Committee Member, Graduate Program Funding Strategies Subcommittee. (2013 - Present).

Director, BMB Graduate Program Director. (2012 - Present).

Member, Translational Ph. D. Program Curriculum committee. (2011 - Present).

Director, Molecular Medicine Pathway Program. (2010 - Present).

Member, Department Service Committee. (2007 - Present).

Member, Departmental Executive Committee. (2007 - Present).

Member, Departmental Research & Graduate Education Committee, (2007 - Present).

Chair, BMB Graduate Program Operating Committee. (2004 - Present).

Committee Member, Masters in Biomedical Science Committee. (2014 - 2015).

Director, BMB Executive PhD Graduate Program Director. (2013 - 2014).

Committee Member, Online Education Committee. (2013 - 2014).

Member, Search Committee, Complex System. (2012).

Committee Member, Medical Admissions Committee. (2011 - 2012).

Member, Department of Chemistry University of Miami Faculty Search Committee. (2010 - 2012).

Member, PIBS Admission Committee. (2010 - 2012).

Member, Medical School Academy of Educators Task Force. (2011).

Founding Chair, School of Science Junior Faculty Shared Learning Forum. (2009 - 2010).

Member, Chemistry Faculty Representative, Tuning USA Pilot Project. (March 2009 - December 2009).

Member, Chemistry Tenure-track Faculty Search Committee. (2009).

Member, Environmental Science Chair Search Committee. (2009).

Member, Forensic-Biology Lecturer Search Committee. (2009).

Member, Fund Raising Committee Project SEED Program. (2009).

Member, Recruitment Committee Women in Science program. (2009).

Member, Faculty Recruitment Committee. (2008 - 2009).

Member, Chemistry Department Chair Search Committee. (2007).

Member, Chemistry Lecturer Search Committee, (2007).

Panel Member, IUPUI Preparing Future Faculty Summer Institute. (2007).

Member, Research Committee. (2006 - 2007).

Member, Forensic Lecturer Faculty Search Committee. (2006).

Member, Forensic Tenure-Track Faculty Search Committee. (2006).

Graduate Student Recruitment Committee. (2005 - 2006).

32. *Community Activities*

Judge, 19th Hoosier State Science and Engineering Fair.
(2007)

Participant, ACS Project SEED.
(2008 - 2009)

Judge, Divine Savior Lutheran School Science Fair.
(2008)

Guest Speaker, IUPUI Center for Young Children.
(2008)

Guest Speaker, Interdisciplinary Relationships in Math and Science" organized by CIESC and Project SEAM.
(2008)

Guest Speaker, Nanoday at Patricia and Phillip Frost Science Museum.
(2013, 2014, 2015, 2016)

Guest Speaker, Project SEAM, Indianapolis, IN.
(2006)

Judge, Regional Science Fair.
(2009)

Guest Speaker, Science Demonstration Hoosier Road Elementary.
(2009)

Guest Speaker, The Central Indiana Educational Service Center (CIESC) and Project SEAM, Indianapolis, IN.
(2007)

Volunteer, The Central Indiana Educational Service Center (CIESC).
(2007)