



## MEMORANDUM

**To:** Julio Frenk, President

**From:** Tomás A. Salerno  
Chair, Faculty Senate

**Date:** January 31, 2019

**Subject:** Faculty Senate Legislation #2018-36(B) – Creation of a New Master of Science in Biochemistry and Molecular Biology, Miller School of Medicine

[Reference 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]

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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 new Master of Science (MS) in Biochemistry and Molecular Biology (BMB). The new degree will require the completion of 30 credit hours and will operate as part of the sequential degree program with Masters of Business Administration (MBA) at the Business School.

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

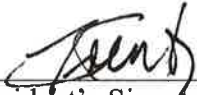
This legislation is now forwarded to you for your action.

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  
Sapna Deo, Director of Graduate Studies, Biochemistry and Molecular Biology

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

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

OFFICE OR INDIVIDUAL TO IMPLEMENT: 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): \_\_\_\_\_



# 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](mailto: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

Sapna

Last Name

Deo

Proponent's Title

MS in Biochemistry and Molecular  
Biology

Department, if applicable

Biochemistry and Molecular Biology

School/College

Miller School of Medicine

E-mail

sdeo@med.miami.edu

Phone

305-243-4421

Title of Proposal

MS in Biochemistry and Molecular Biology

(-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.

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

Yes     No

If no, explain why:

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### 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:

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### 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

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**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

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End form.

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MILLER SCHOOL  
of MEDICINE

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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  
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

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 15<sup>th</sup> 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 14<sup>th</sup> Street | Suite 360R (R95)  
Miami, FL 33136 | Tel: (305) 243-5677 | Fax: (305) 243-1698*





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,

A handwritten signature in blue ink, appearing to read 'Henri R. Ford'.

Henri R. Ford, MD, MHA



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,

A handwritten signature in black ink, appearing to be 'CS', written over a white background.

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

University of Miami  
Leonard M. Miller School of Medicine  
Don Soffer Clinical Research Center  
Suite 723  
Miami, Florida 33136

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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

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**Friday, October 26, 2018 at 3:51:32 PM Eastern Daylight Time**

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**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](mailto:Dlee@miami.edu)



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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

**SYLVIA DAUNERT**  
**PROFESSOR AND LUCILLE P. MARKEY CHAIR**



**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,

A handwritten signature in blue ink that reads "Sylvia Daunert". The signature is written in a cursive style and is underlined with a single horizontal line.

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



**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](mailto: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: December 21, 2018

TO: Tomas Salerno  
Chair, Faculty Senate

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

SUBJECT: Proposal – MS in Biochemistry and Molecular Biology

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The department of Biochemistry and Molecular Biology submitted a proposal to create a new Master's degree program in Biochemistry and Molecular Biology. The proposal was discussed at the meeting of the Graduate Council on Tuesday, September 18, 2018, and was approved by the council members.

cc: Sapna Deo, Graduate Program Director, Department of Biochemistry and  
Molecular Biology  
Shanta Dhar, Associate Professor, Department of Biochemistry and Molecular  
Biology  
Patty Murphy, Executive Director, Office of Assessment and Accreditation

Proposal to establish a new  
**MS in Biochemistry and Molecular Biology**

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

July 2018

## **TITLE OF THE DEGREE. MS in BMB.**

### **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 MS degree program. The master's degree in BMB will emphasize on laboratory-based or industrial research training, 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 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. 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. This program will also emphasize on skills necessary to enter biotechnology, pharmaceutical, and healthcare workforce. 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. 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. A high demand for Masters level trained personnel 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.

## **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.

#### **Recruitment**

The department of Biochemistry and Molecular Biology will be 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.

## **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-director of the program. The MSPD and the co-director with 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.

### **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.

## **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.



## **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.pdf](https://grad.miami.edu/_assets/pdf/bylaws-of-the-graduate-school.pdf) Additional 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.

#### **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 MSPD 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 maintain a contact with our Masters alumni and get their feedback about the program at specific intervals.

## **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.

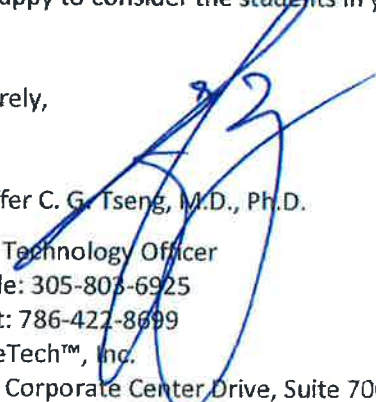


Dr. Sapna Deo, PhD  
Professor & Graduate Program Director  
Department of Biochemistry and Molecular Biology  
University of Miami Miller School of Medicine  
Email: [SDeo@med.miami.edu](mailto:SDeo@med.miami.edu)

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  
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**B E R G™**

**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](mailto: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](mailto: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

## 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- 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 researchers 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 participate 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.