

Biomedical Sciences Graduate Program

School of Medicine - Medical Science Campus



Explore our Graduate School

Jennifer L. Barreto-Estrada, Ph.D.
Graduate Program Coordinator

Biomedical Sciences

Professor

Department of Anatomy and Neurobiology

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787-758-2525 exts. 1879; 1815, 7017



Programa

Casa Abierta de la Escuela Graduada de Ciencias Biomédicas

Viernes, 4 de noviembre de 2022 de 8:00 AM a 4:00 PM

Salón 545 A y B

8:00 - 8:45 am	Registro	Lisa Santos / Julia Prado
8:45 - 9:10 am	Bienvenida	Dra. Nivia L. Pérez Acevedo Dr. Carlos Ortiz Dr. Humberto M. Guiot
9:10- 9:30 am	Orientación General (Admisión Programas MS/PhD/MD-PhD)	Dra. Jennifer Barreto
9:30 - 9:45 am	Anatomía & Neurobiología	Dra. María A. Sosa Llorens
9:45 - 10:00 am	Microbiología & Zoología Médica	Dra. Filipa Godoy
10:00 - 10:15 am	Farmacología & Toxicología	Dr. Yamil Gerena
10:15 - 10:30 am	Merienda	
10:30 - 10:45 am	Bioquímica	Dr. José Rodríguez Medina
10:45 - 11:00 am	Fisiología	Dr. Jorge D. Miranda
11:00 - 12:30pm	Almuerzo / Intercambio con Estudiantes Graduados Salón A545 A y B	
12:30 - 3:00	Visita a las facilidades de cada Departamento	

	12:30-1:00 pm	1:00-1:30 pm	1:30-2:00 pm	2:00-2:30 pm	2:30-3:00 pm
Grupo 1	Microbiología	Farmacología	Anatomía	Fisiología	Bioquímica
Grupo 2	Farmacología	Anatomía	Fisiología	Bioquímica	Microbiología
Grupo 3	Anatomía	Fisiología	Bioquímica	Microbiología	Farmacología
Grupo 4	Fisiología	Bioquímica	Microbiología	Farmacología	Anatomía
Grupo 5	Bioquímica	Microbiología	Farmacología	Anatomía	Fisiología

Biomedical Sciences Graduate Program

School of Medicine - Medical Science Campus

<https://md.rcm.upr.edu/biomed/>

Biomedical Sciences apply basic science in different disciplines to human health.

Biology-study of life
Medical- medicine, prevention, diagnostic and treatment of disease.

Our **goal** is to educate individuals dedicated to pursue an exciting and rewarding career, in an academic environment leading to excellence in **research and teaching**.

@NLPA



Decanato Asociado de Ciencias Biomédicas
Programa de Estudios Graduados
ESCUELA DE MEDICINA UPR

CASA ABIERTA 2022

VIERNES 4 DE NOVIEMBRE **VIERNES 30 DE SEPTIEMBRE**
8:00am-3:30pm
RCM Salón 545

DONDE SE ORIENTARÁN SOBRE LOS PROGRAMAS GRADUADOS EN:

- Anatomía
- Bioquímica
- Farmacología
- Fisiología
- Microbiología

ESTUDIOS GRADUADOS CONDUCTORES A:

- Maestría en Ciencias (M.S.)
- Doctorado en Filosofía (Ph.D.)

Durante la mañana tendremos la orientación general y en la tarde las visitas guiadas a algunos laboratorios.

Para información adicional, puede comunicarse a nuestra oficina llamando al 787-758-4639 o al 787-758-2525 exts. 1831 ó 7017

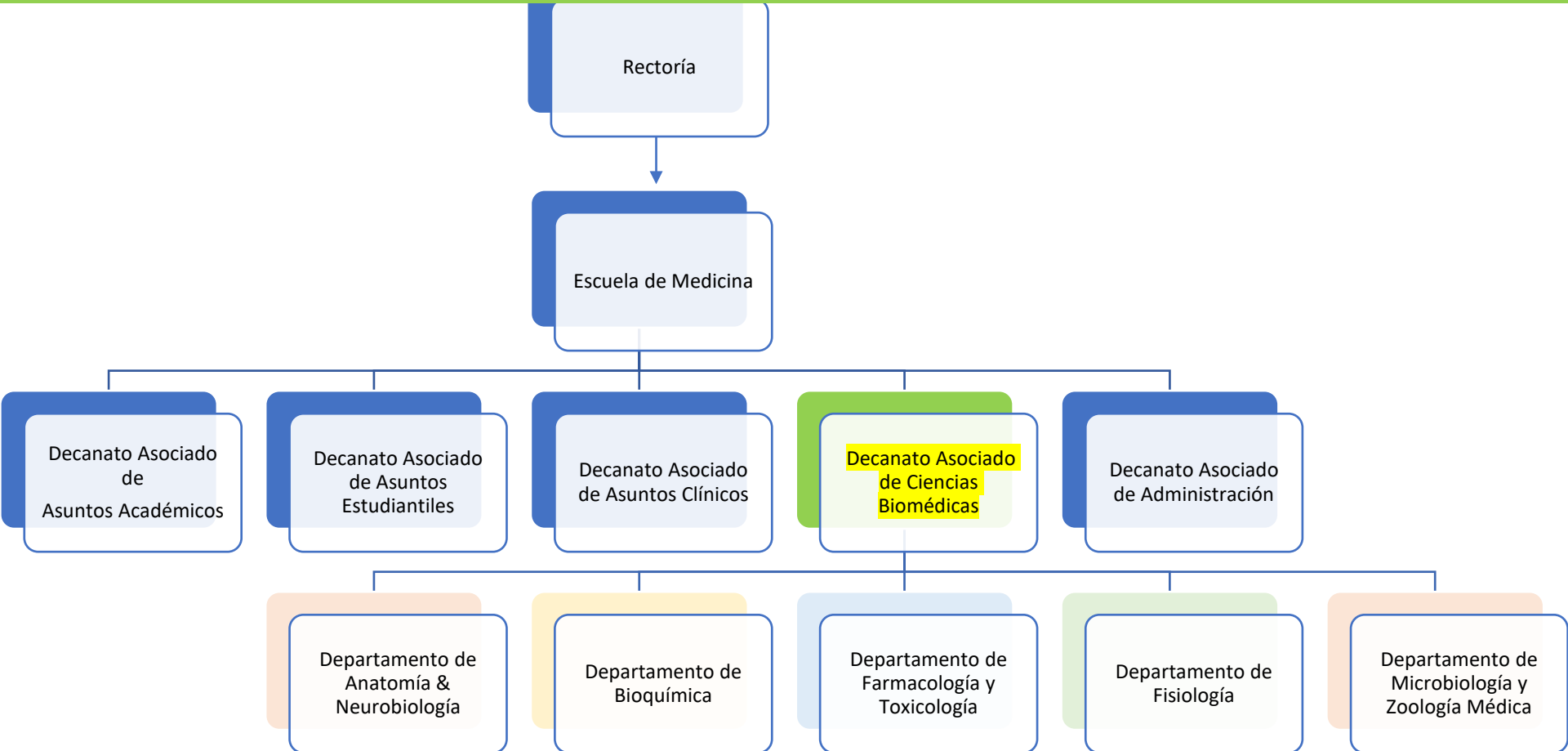
Biomedical Sciences Graduate Program

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- ❖ Our students receive outstanding scientific research training from scientist who are leading in their fields of study.
- ❖ Our graduate program emphasizes and supports collaborative interdisciplinary research.
- ❖ Being part in a medical school, our students may also receive research training in translational and clinical sciences, in addition to its basic science training.

UPR-MSC & Deanship of Biomedical Sciences



Biomedical Sciences Graduate Program

School of Medicine - Medical Science Campus

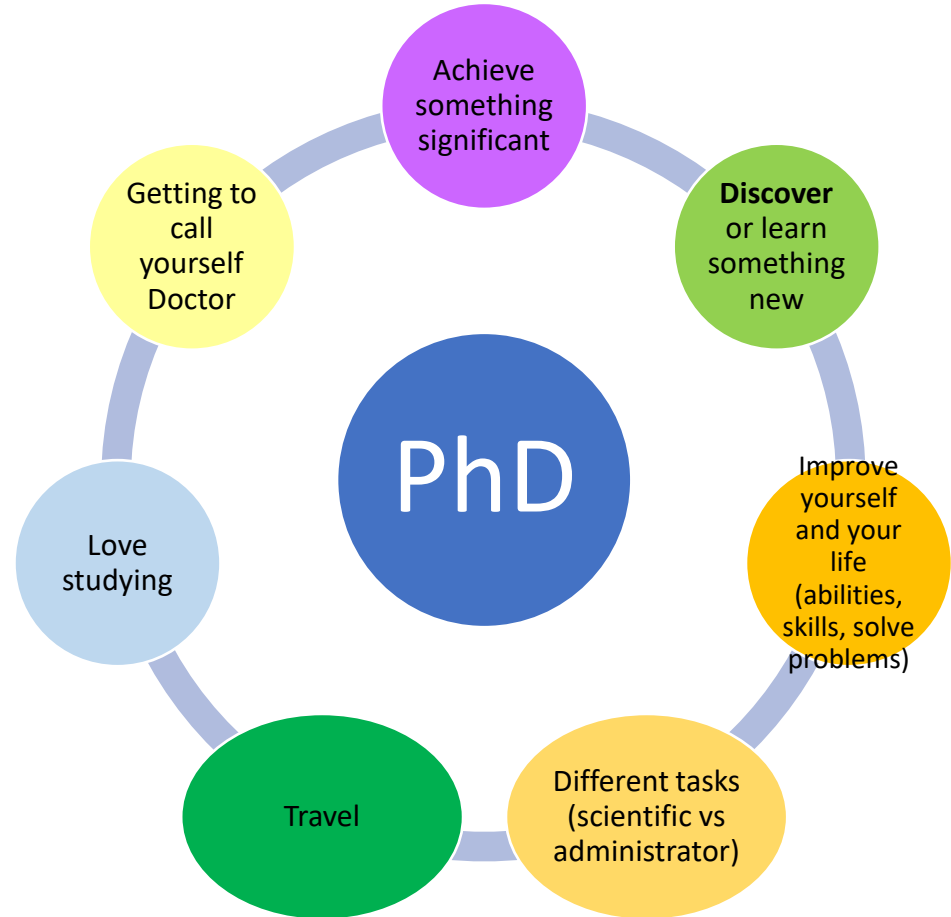
<https://md.rcm.upr.edu/biomed/>

We are the only academic institution in Puerto Rico that offers programs leading to a Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees with specialties in:

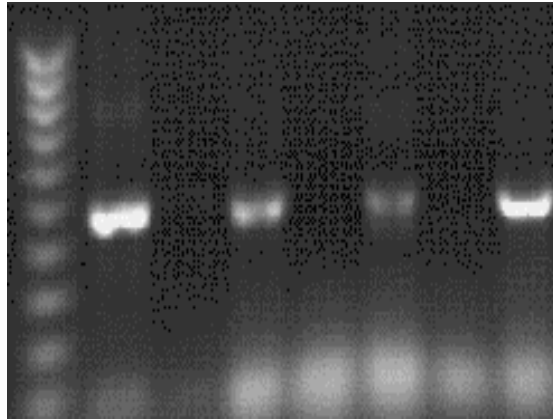
- ❖ Anatomy
- ❖ Biochemistry
- ❖ Microbiology
- ❖ Pharmacology
- ❖ Physiology

We support concurrent MD, PhD degrees programs in our academic institution. Candidates interested in this path, must apply to both programs simultaneously.

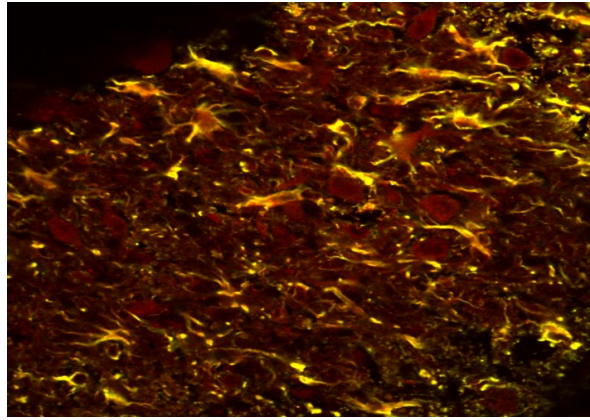
Our BSGP* cosponsor an intercampus Ph.D. program with the Department of Biology at the Río Piedras Campus.



Students have opportunities to learn cutting edge theoretical and practical skills, and performed research projects that may range:



From nucleic acids



To cells



To tissues

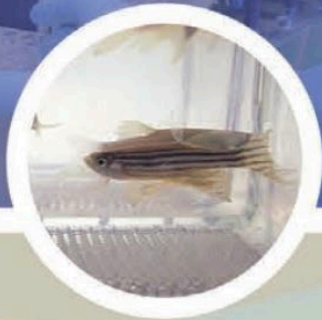


To whole animals

<https://md.rcm.upr.edu/biomed/>

You would have the opportunity to rotate in different laboratories and explore your research interest in order to find the potential mentor that will help you achieve

DEPARTAMENTO DE ANATOMIA & NEUROBIOLOGÍA



- Andrógenos durante la pubertad y el control neural de la reproducción.
- Desarrollo de regeneración neuronas sensoriales en pez sebra.
- Regeneración neural en sistema visual.
- Rol de interneuronas espinales en control de locomoción.
- Morfología, biomecánica y control neural de locomoción.
- Rol de receptores acoplados a proteínas G en tumores de retina.
- Neuroendocrinología del comportamiento; Intersexualidad.
- Estructura macromolecular de fibras musculares.
- Regulación neural de adicción al alcohol.
- Actividad rítmica en el sistema nervioso de modelos invertebrados.
- Diferencias sexuales en ansiedad y memoria emocional.
- Trauma cerebral y su efecto en la memoria.
- Bases neurales de comportamiento interactivo en modelos crustáceos.
- Tráfico de receptores neurales en membranas celulares.
- Rol de la amígdala y corteza prefrontal en el miedo.
- Desarrollo y plasticidad de la sinapsis en *Drosophila*.

DIRECTORA DEL DEPARTAMENTO
Dra. María Sosa
787-758-2525 exts. 1500, 1514
maria.sosa@upr.edu



Anatomy & Neurobiology

School of Medicine - Medical Science Campus

<https://md.rcm.upr.edu//anatomyneurobiology/>



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Professor & Chairman
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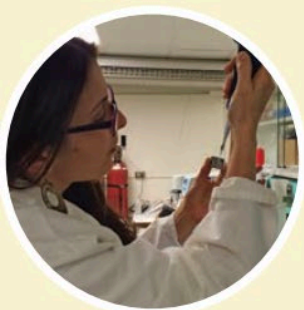


Mark W Miller, PhD
Professor
Coordinator
Graduate Program in Anatomy
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787-721-4149 x269

DEPARTAMENTO DE BIOQUÍMICA



- Bioquímica de Proteínas.
- Rol de oncogenes y micro RNAs en cancer
- Genética molecular humana y biología translacional de células madres.
- Genética humana, desórdenes genéticos que afectan a la población de PR, regulación y expresión genética.
- Relaciones Entre Estructura y Función de Proteínas.
- La transducción de señales en la metástasis del cáncer de mama, la terapia natural para el cáncer de mama.
- Biología Molecular y Celular
- Glucobiología
- Bioquímica Toxicológica
- Toxicología Molecular
- Proteómica



Biochemistry Department

<https://md.rcm.upr.edu/biochemistry/graduate-program/>



José R. Rodríguez Medina, Ph.D.
Professor and Chairman
jose.rodriguez123@upr.edu
(787) 758-2525 ext. 2299



Surangani Dharmawardhane, PhD
Professor
Coordinator – Graduate Program
in Biochemistry
su.d@upr.edu
Tel: 787-758-2525 exts: office
1630 – lab: 1610

DEPARTAMENTO DE FARMACOLOGÍA & TOXICOLOGÍA



- Expresión del receptor de insulina en diabetes y en HIV
- Farmacología del corazón: la comunicación intercelular del corazón del sistema renina-angiotensina
- La genética molecular, las características epidemiológicas y clínicas de cáncer de cabeza y cuello
- Propiedades neuroactivas de productos naturales.
- Carcinogénesis Química, Biomarcadores, Toxicología y Evaluación de Riesgos
- Neuroprotección contra el accidente cerebrovascular y el envenenamiento por organofosfato



Pharmacology & Toxicology Department

<https://md.rcm.upr.edu/pharmacology/>



Yamil Gerena, Ph.D.
Professor and Chairman
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Dr. Antonio H. Martins, Ph.D.
Professor
Coordinator – Graduate
Program in Pharmacology
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(787) 758-2525 ext. 1303

DEPARTAMENTO DE FISIOLOGÍA



- Desarrollo y Regeneración del sistema nervioso
- Fisiología celular y molecular
- Fisiología cardiovascular
- Neuroendocrinología de reproducción
- Células Gliales y Caveolinas
- Neurofisiología
- Fallo Cardíaco y Arteriosclerosis
- Fisiología del Ejercicio
- Genómica funcional
- Farmacología y Biología vascular

OTRAS ÁREAS DE INVESTIGACIÓN ESTÁN
DISPONIBLES A TRAVÉS DE COLABORACIONES CON EL
RECINTO DE RÍO PIEDRAS, CENTRO DE PRIMATES DEL
CARIBE Y EL CENTRO CARDIOVASCULAR



Physiology and Biophysics

School of Medicine - Medical Science Campus

<https://md.rcm.upr.edu/physiology/>



Annabell C. Segarra, Ph.D.
Professor and Chairman
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Jorge Miranda, Ph.D.
Professor
Coordinator – Graduate
Program in Physiology
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(787) 758-2525 ext. 1631

DEPARTAMENTO DE MICROBIOLOGÍA & ZOOLOGÍA MÉDICA



- Bacteriología Médica
- Inmunología (Patogénesis VIH)
- Inmunología
- Parasitología Molecular e Inmunología
- Parasitología Médica
- Micología Médica
- Bacteriología Molecular y Médica
- Virología



Microbiology and Medical Zoology

School of Medicine - Medical Science Campus

<https://md.rcm.upr.edu/micro/>



Filipa Godoy Vitorino, Ph.D.
Associate Professor and
Chairman

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7069, 1361



Ana Espino, Ph.D.
Professor
Coordinator – Graduate
Program in Microbiology
ana.espino1@upr.edu
(787) 758-2525 ext. 1318

Departments

- **ANATOMY & NEUROBIOLOGY**

- locomotion, hormones, behavior, etc
- 5th floor

- **BIOCHEMISTRY**

- cell division, angiogenesis, genetics, etc
- 6th floor

- **MICROBIOLOGY & ZOOLOGY**

- virology, immunology, etc
- 3rd floor

- **PHARMACOLOGY & TOXICOLOGY**

- cancer, toxicology, heart disease, etc
- 3rd floor

- **PHYSIOLOGY**

- drug addiction, heart failure, DNA repair, etc
- 6th floor



UPR-MSU: Dr Guillermo Arbona (main building)

(Degree requirements may vary between departments. Check this carefully!)

Graduate School Application

Online application must be submitted by **February 1, 2023.**

A non-refundable application fee is payable at the time of application. You may apply up to three (3) programs.

Official decisions regarding the application for admission are communicated directly by the BSGP.



<https://sistemas.rcm.upr.edu/admisiones/>

Minimum Requirements for Admission

- ☒ BS or BA degree from an accredited institution
 - ☒ 3.0 minimum grade point average in Science (GPS)
 - ☒ 3.0 minimum general grade point average (GPA)
(on a 4.00 scale)

- ☒ Official Transcripts (3)

APPLY NOW

- ☒ A working knowledge of both English and Spanish

NEW -Graduate Record Examination (GRE) will **NOT be required**

Minimum Requirements for Admission

- ☒ Three (3) letters of recommendation
 - ✓ Two (2) from professors in the major field
 - ✓ One (1) from a professor in another department
- Form for recommendation letters submission:

[English version](#)

[Spanish version](#)

- ☒ An Essay
 - ✓ in English with a maximum of 250 words or an interest letter with a brief description of your interest in the field.

- ☒ Submission of complete application on time (online)

- ☒ Interview(s)

- ☒ Evidence of previous research experience, if any (abstracts, papers, etc.)



General Admission Requirements Checklist

- ☐ BS or BA degree from an accredited institution
- ☐ 3.0 minimum grade point average in Science (GPS)
- ☐ 3.0 minimum general grade point average (GPA)
- ☐ Three (3) letters of recommendation
- ☐ An Essay (250 words in English)
- ☐ Official Transcripts (3)
- ☐ Submission of complete application (online)
- ☐ Interview(s)
- ☐ Evidence of previous research experience, if any (abstracts, papers, etc.)
- ☐ [Additional information form](#)

Admission Formula

$$[(\text{GPA}/4.0)*30] + [(\text{GPS}/4.0)*30] + [(\text{RL}/66)*10] + [(\text{I}/20)*30] = \text{SCORE} + (\text{RE Bonus}/40)*10] = \text{Final Score}$$

Formula legend:

GPA – grade point average

GPS – grade point science

RL – Recommendation Letters

I – Interview

We evaluate all students on an equal terms, regardless of race, sex or religion. Each one of these requirements will be incorporated to the admission formula.

Each Department generates a descending order of interested students in each program and sets the maximum number of students that could be admitted according to the order of merit and availability of positions.

BASIC SCIENCE REQUIRED COURSES BY ALL DEPARTMENTS

- General Biology
- General Chemistry
- General Physics
- Organic Chemistry
- Calculus

Each department may have additional requirements, please check!!!

Recommended Courses

- Analytical Chemistry (required for some depts.)
- Biochemistry
- Cell & Molecular Biology
- Genetics
- Anatomy & Physiology
- Microbiology & Immunology

Degrees Offered

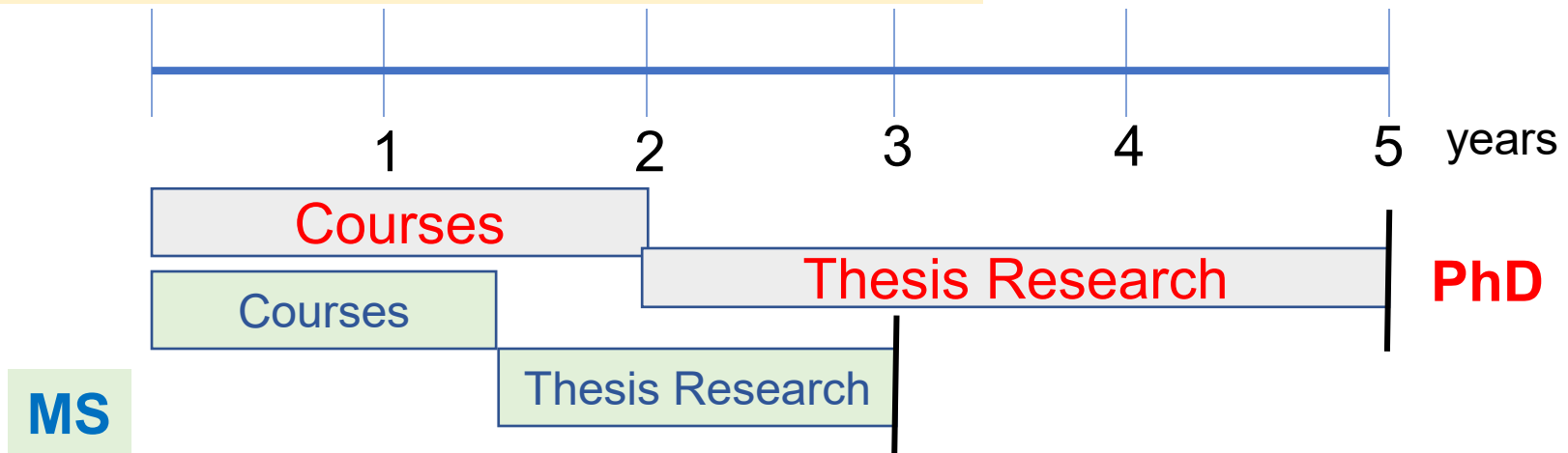
Master in Science (M.S.)

- 25-29 Credits in Courses
- 6 Credits in Thesis Research
- Total 31 - 35 credits

* Doctor in Philosophy (Ph.D.)

- 45 - 50 Credits in Courses
- 15 Credits in Thesis Research
- Total 60 - 65 credits
- Comprehensive/Qualifying Exam

Suggested timeline for MS and PhD Program



MD, PhD Program

In our Institution, the candidate applies to both program **simultaneously** and **must** be accepted on both Programs (Concurrent/Combined)

- **Years 1-2: Medical School Curriculum**
 - Summer: research activities
 - USMLE step I: medical licensure examination
- **Years 3-7: Ph.D. Curriculum**
 - Basic science courses & thesis research)
 - Summer: clinical research experiences
- **Years 7-8: Medical School Curriculum**
 - USMLE step II: medical licensure examination



Financial Assistance

The student may receive financial support from assistantships and available funds through their mentors or any other external funding.

If awarded, the student must remain in good academic standing.



- *Programa de Ayudantía de Cátedra e Investigación, UPR-RCM*
- Funds from Investigator's Grants
- Loans and Part-time Employment

Students must submit the Free Application for Federal Student Aid (FAFSA).

External Funds

Students are strongly encouraged to seek external funding from sources outside the Biomedical Sciences Program and the School of Medicine to support their research and dissertation writing, such as:

- RISE Minority Program UPR-MSU
(now transitioning to G-RISE/T-32)
- Federal Research Fellowships, i.e. pre-doctoral
- Foundations and Scientific Societies Fellowships

Scholarship Finder

The Scholarship Finder is a web site that allows you to narrow your fellowship options and opportunities by using test scores, location, type of award and school type.

Additional Research Facilities

- Individual Research Laboratories
- Molecular Sciences Building
- RCMI Facilities
- Caribbean Primate Center
- Neurobiology Institute (San Juan)
- RCMI Clinical Research Center
- Cancer Research Center





UNIVERSITY OF PUERTO RICO, MEDICAL SCIENCES CAMPUS,
SCHOOL OF MEDICINE

**Office of the Associate Dean for Biomedical
Sciences & Director of Graduate Studies**

COURSE TITLE: *Introduction to Biomedical Research*

COURSE NUMBER: **CBIO 5990** (suggested)

CREDITS: 1-3 credits

CONTACT HOURS: 18 – 126

COURSE COORDINATOR: **Dr. Nivia L. Pérez-Acevedo**

Office: A-556
Office Phone: Extension 1512 (MSC, 787-758
Office Fax: 1-787-767-0788
E-mail address: nivia.perez@upr.edu
Office Hours: By appointment

PREREQUISITES: None (Courses)

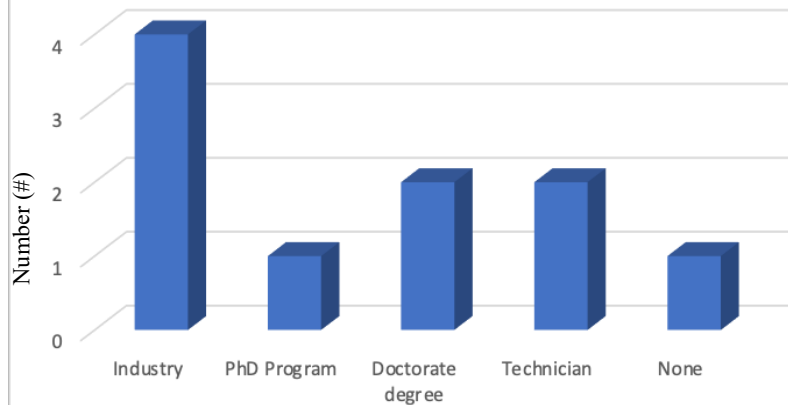
**Authorization of the Course Coordinator and the approval of the Associate Dean of
Biomedical Sciences is required.**

CO-REQUISITES: None

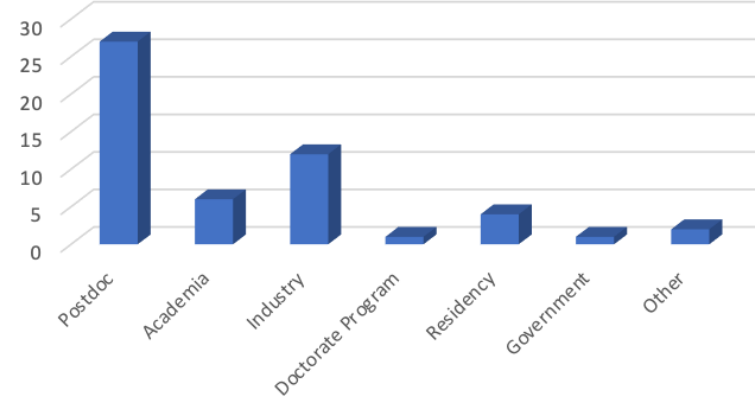
New
Course

Outcomes after Graduation

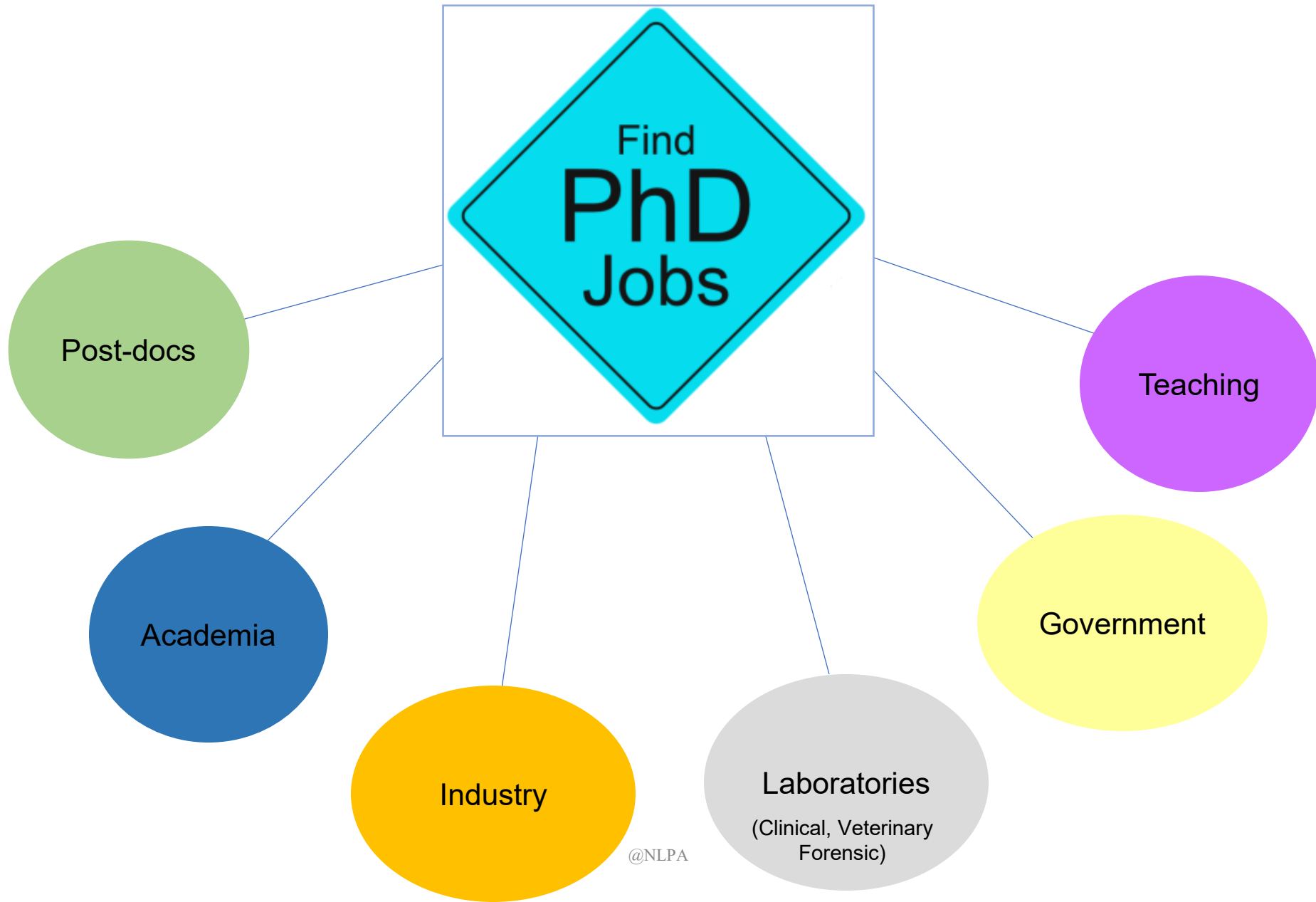
MS: Positions after graduation



PhD: Positions after graduation



Career Opportunities



Examples of Institutes and Universities where graduates are doing a Postdoctoral training during 2016-17 to 2020-21.

Scripps Research Institute, West Palm Beach, Florida

NHGRI

National Institute of Mental Health (NIH)

UPR – MSC

University of California at San Francisco

National Cancer Institute (NCI)

University of Texas Austin

University of Florida

National Institute of Neurological Disorder and Stroke

Universidad Central del Caribe

Marine Biological Laboratory (MBL) at Woods Hole

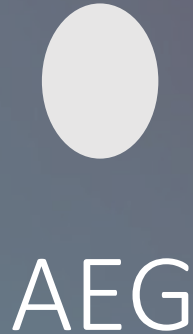
Temple University

NIH Clinical Center

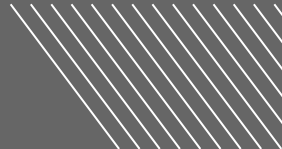
Loma Linda University Health

Yale University

Asociaciones Estudiantiles



Somos una organización estudiantil sin fines de lucro que representa y lucha por los intereses académicos y derechos de todos los estudiantes del programa graduado de Ciencias Biomédicas del Recinto de Ciencias Médicas.

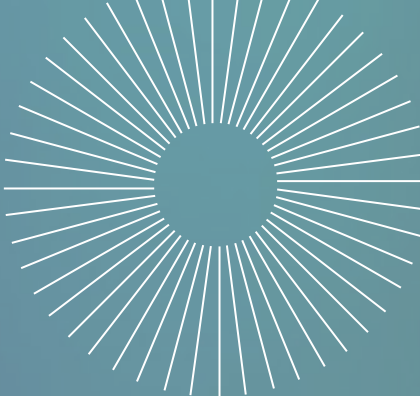


OUR TEAM



Presidencia

Yesenia M. Acevedo Rivera
PhD Bioquímica



Vicepresidencia

Christopher Ayala
PhD Farmacología



Secretaría

Rachell Martínez
PhD Bioquímica

OUR TEAM



Anatomía

Marcell González
MS Anatomía



Bioquímica

Jessica Colón
PhD Bioquímica



Farmacología

Lorivette Ortiz
PhD Farmacología



Fisiología

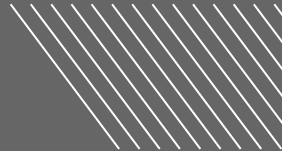
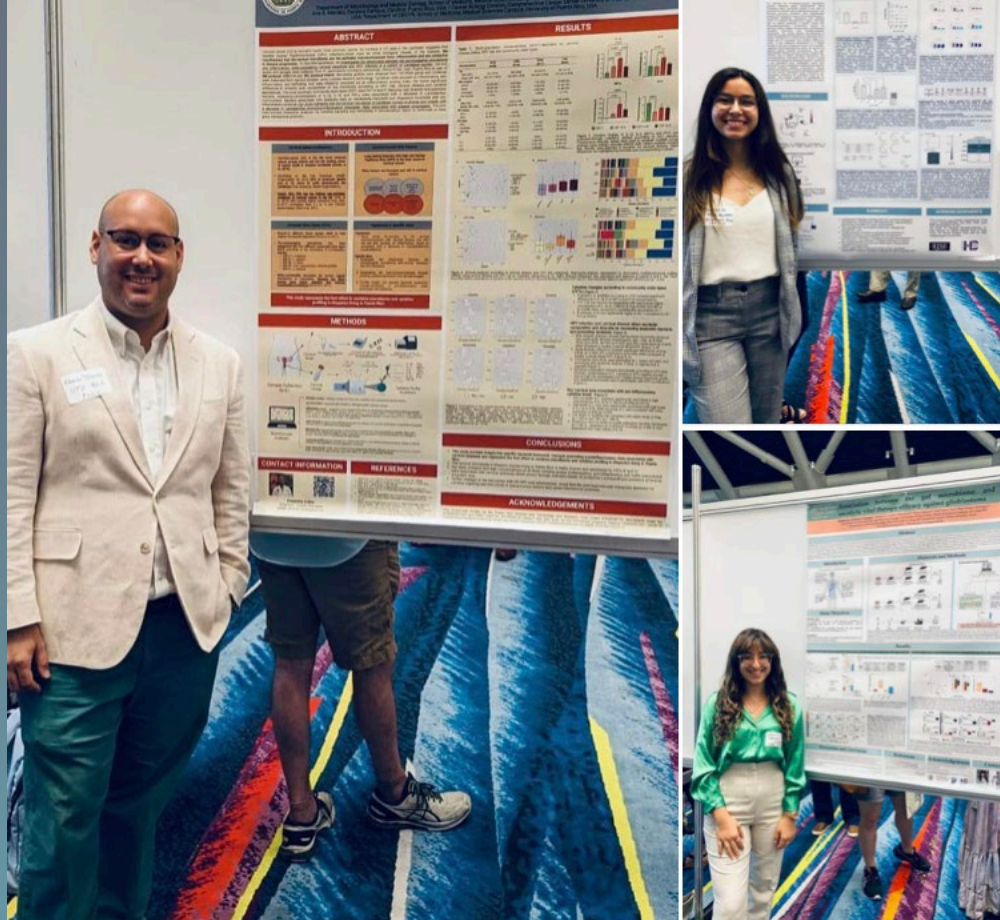
Joseph Capella
PhD Fisiología



Microbiología

Riseilly Ramos
PhD Microbiología

Capítulo de Microbiología-RCM



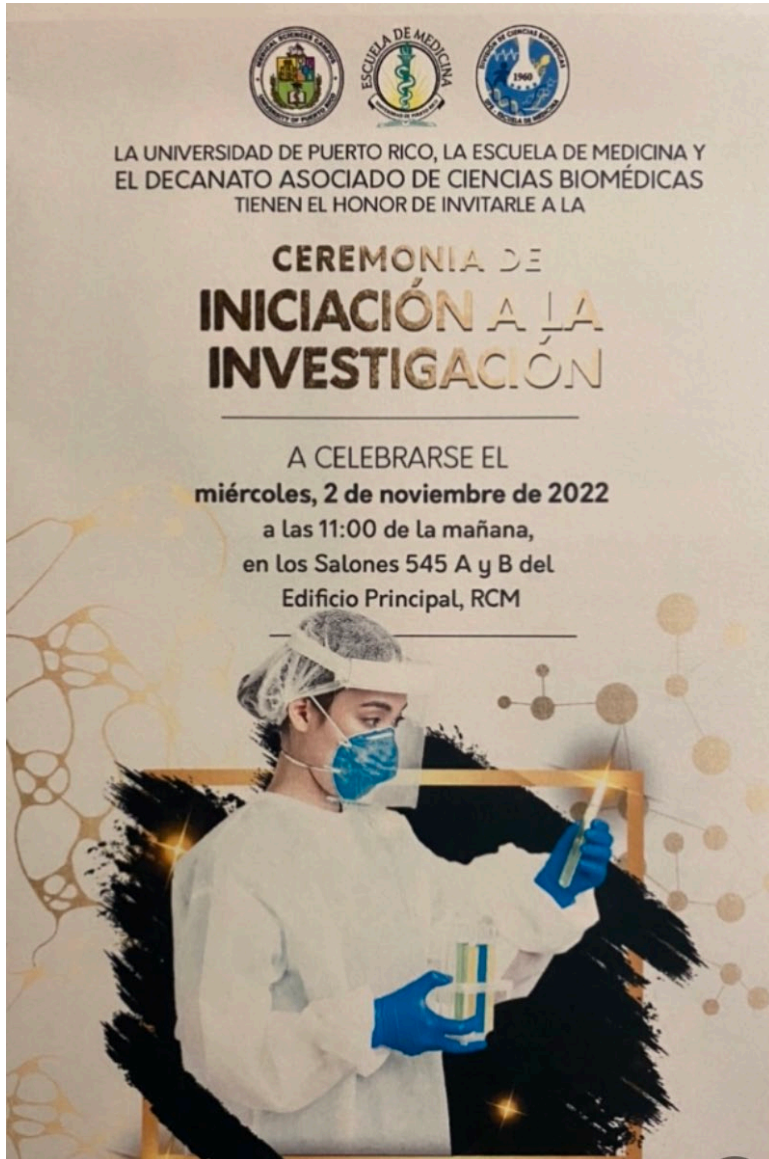
Other Activities



Nobel Prize, (Medicine/Physiology,1998)-Louis Ignarro, PhD

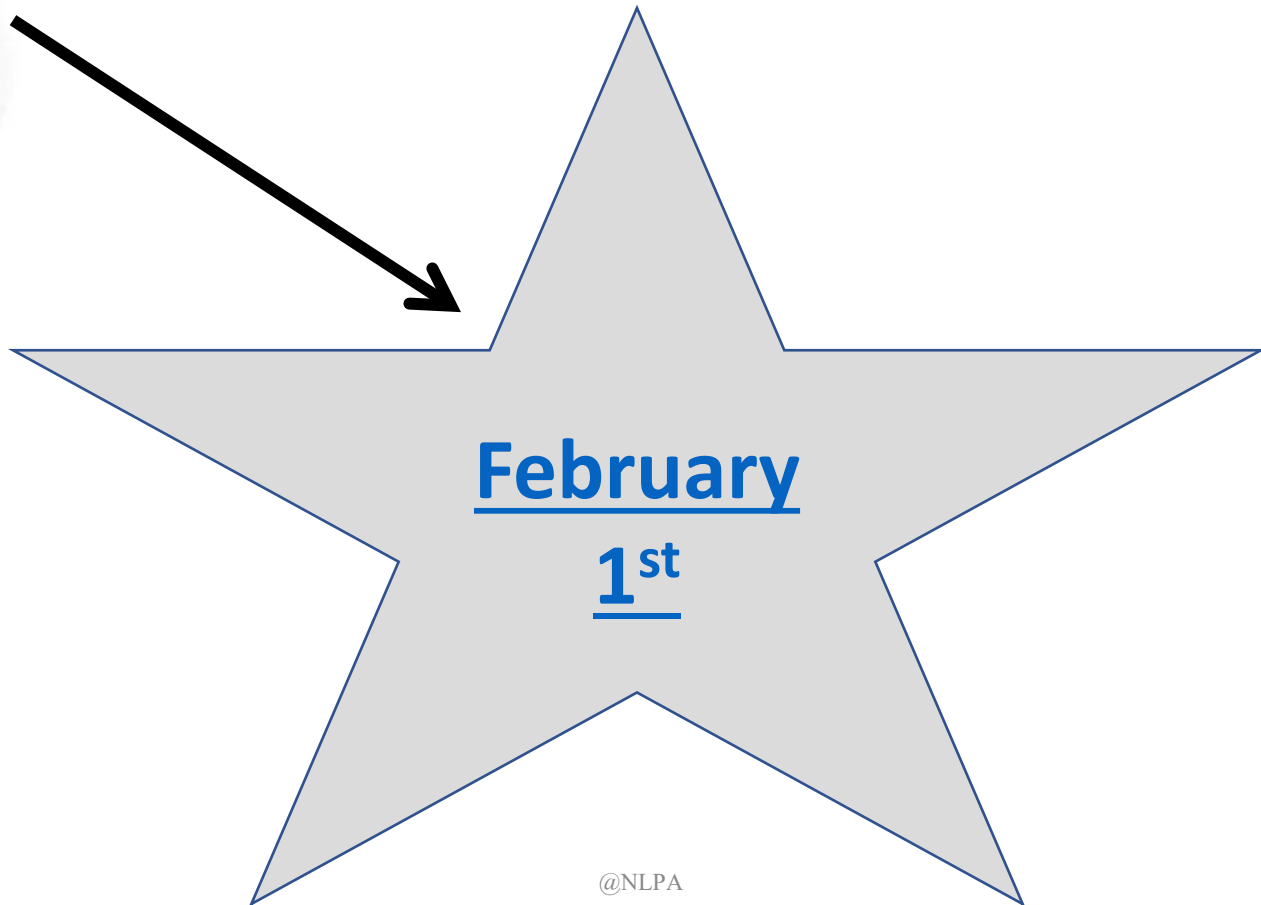


White Coat Ceremony (Biomedical Sciences)





**Submit your application
by**





Nivia L. Pérez-Acevedo, Ph.D.

Interim Associate Dean

Biomedical Science

Professor

Dept. of Anatomy and Neurobiology

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Jennifer L. Barreto-Estrada, Ph.D.

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md.rcm.upr.edu/biomed

Contact Us

Information regarding admission process please
contact Ms. Lisa Santos.



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Ms. Lisa Santos

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@NLPA



¡Hope to see you soon enrolled in our program!