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Industrial Liaison Program: An Introduction

Dr. José Meléndez
Industrial Liaison Officer
Special Assistant to the Chancellor
University of Puerto Rico Mayagüez

Are you a part of opportunities like these?



ARCI



CoE



E-Commerce
Mobile_Internet
Autonomous_Systems
Wearables
Vegan-
Artificial_Intelligence
Recycling
Ambient_Control
Machine_Learning
Internet_of_Things
Wireless_Power
Robotics
Social_Publishing
Drones
Digital_assistants
Water_generation
Soil_and_Water_Sensing
Sanitation
Blockchain
Mixed_Reality
E-Literature
Precision_Agriculture
Smart_materials
Linguistics
Fusion_&_Fission
Sustainable_Energy
Social_Genetics
Social-Mobile
Education_C3K-12
Vertical_Farming
Emotional_Intelligence
Language_Processing

Agenda

- Charter: The Case for an Industrial Liaison Office[r] (ILO)
- Your ILO
- Industrial Liaison Program (ILP) Vision & Mission
- Initial ILP Priorities
- Faculty, Student, and Staff Capabilities
- Industry Needs
- Faculty + Students + Industry = Engagement
- UPRM “Industrial” Ecosystem
- I am here for you!

Charter: The Case for an ILO

- UPRM Taskforce on Corporate Engagement
 - Formed by Interim Chancellor January 2018
 - Members selected from Industry, Government, and Academia
 - Co-Leader: David Bridges, Economic Development Lab of Georgia Tech
 - Co-Leader: Prof. Eduardo Juan, College Engineering (Only UPRM Member)
- Charter of Corporate Engagement Taskforce:
 - Assess state of UPRM corporate engagement
 - SWOT analysis of UPRM corporate collaborations
 - Identify recommendations for UPRM corporate engagement
 - ❖ Recommendations presented to Chancellor & Deans September 2018



Taskforce Topline SWOT Impressions

S Strength	W Weaknesses	O Opportunities	T Threats
<p>Quality & Reputation: Excellent track record of producing great employees for companies (8)</p> <p>Diversity: Diverse and bilingual students and faculty (7)</p> <p>Alumni: Massive and accomplished alumni network (6)</p> <p>Proximity to Industry: Geographically close to specific industry clusters (pharma, biotech, aerospace) in need of innovation to be more competitive in a global economy (5)</p>	<p>Slow/bureaucratic: Does not move at the speed of industry and too much bureaucracy (11)</p> <p>ILO: Missing dedicated staff with industry experience to take on industry liaison officer (ILO) (10)</p> <p>Teaching Loads: Difficulty adjusting teaching loads as UPRM transitions from a traditional undergraduate teaching institution to more R&D and graduate programs (4)</p> <p>Academic Alignment: Programs and curriculum not aligned with industry needs (4)</p> <p>Perception: Not viewed by industry as a place for research, development, and innovation (4)</p>	<p>Ecosystem: Better industry-university-government coordination and cooperation (11)</p> <p>Industry Needs Innovation: Manufacturing economy needs modernization, higher-value added jobs are desired, innovation is needed to solve biggest local and global problems (7)</p> <p>Students Desire Innovation: Growing demand by students for innovation experiences, entrepreneurship skills, industrial-relevant education, real-world projects, and practical internships (5)</p> <p>Alignment: Better alignment of university research, education, and philanthropy initiatives with industrial needs and government economic development priorities (5)</p>	<p>Fiscal & Political: Uncertainty about PR fiscal crisis and its impact on campus (tuition, hiring, labs, closure, etc.) (11)</p> <p>Migration: Top faculty, best students, high-paying technical jobs, and critical industry leaving the island for better conditions (9)</p> <p>Regulations and Bureaucracy: The increase of government regulations and institutional barriers are increasing administrative burdens on faculty and stifling industry-university collaboration (8)</p> <p>Competition: Other universities on the island and elsewhere (especially Florida & Texas) could erode the pool of top students, industrial relationships, and top faculty; and online education reduces the need to be on campus (5)</p>

Taskforce Conclusions & Recommendations

- Develop Industry Liaison Program (ILP)
 - Appoint ILO Reporting to the UPRM Chancellor
 - A value-added point-of-contact for Industry with Faculty, Students, and Staff
 - A value-added point-of-contact for Faculty, Students, and Staff with Industry
 - Forward facing and proactive to facilitate value creation for UPRM and Industry
 - Remove barriers for growth of UPRM industrial relationships
 - Address long term need for less UPRM dependence upon government funds
- Recommended ILO Characteristics
 - Combination of academic and industry experience inside/outside of PR
 - Entrepreneurial mindset for creative solutions
 - Program knowledge and functional skills
 - Facilitator and not owner of industrial relationships
 - ❖ Most industrial collaborations occur at the Faculty, Student, and/or Department level

Your ILO: Dr. José Meléndez

- Mom from Moca, Dad from Bayamon, Born in NJ
- Lived in NJ, PR (Moca/Mayagüez), FL, "PI", CA, MA, TX, NV
- Degrees in Electrical Engineering & Computer Science
- BS/MS @ MIT + PhD @ Stanford
- Inventor of 28 U.S. Patents
- Former Research Laboratory Director at Texas Instruments
- Former GM Wireless Infrastructure at Texas Instruments
- Founder of Commoca, Spectral MD, and Patent Calls
- *Ad Honorem* UPRM appointment (aka – Not Paid)
- Married to Dr. Beatriz Lopez – Graduate of UPRM in Biology

Commoca OpenTouch



Spectral MD DeepView



Industrial Liaison Program (ILP) Vision & Mission

Vision

To establish UPRM as a “go to” public university for companies seeking collaborations that improve their innovation capabilities and competitiveness by leveraging top notch multi-disciplinary research, development, education, and advisory professionals.

Mission

The ILP shall foster corporate driven development benefiting the university community through innovative business-oriented endeavors. The ILP seeks to provide creative faculty members, students, and staff with new opportunities to achieve career success, while accelerating the growth of the greater Puerto Rican innovation economy.

Initial ILP Priorities

- Identify, strengthen, and grow existing industry university relationships
- Identify and engage company “decision makers” and select alumni
- Identify and promote motivated university stakeholder capabilities and interests
- Match company stakeholders with university stakeholder champion(s) for Dialog



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Faculty, Student, and Staff Capabilities

○ How companies find students can be straightforward

- Placement Office
- COOP Program
- Department Programs

ACADEMIC MAJORS

**Please identify desired majors*

Agricultural Science

- | | | | |
|---|--|--|---|
| <input type="checkbox"/> Agricultural Education | <input type="checkbox"/> Agribusiness | <input type="checkbox"/> Animal Science | <input type="checkbox"/> Agricultural Extension |
| <input type="checkbox"/> Horticulture | <input type="checkbox"/> Soils | <input type="checkbox"/> Agronomy | <input type="checkbox"/> General Agriculture |
| <input type="checkbox"/> Agricultural | <input type="checkbox"/> Crop Protection | <input type="checkbox"/> Mechanical-Agricultural Tech. | <input type="checkbox"/> Food Technology |

Economics

Business Administration

- | | | | |
|-------------------------------------|---|--|--|
| <input type="checkbox"/> Accounting | <input type="checkbox"/> Marketing | <input type="checkbox"/> Computer Information System | <input type="checkbox"/> Office Administrators |
| <input type="checkbox"/> Finance | <input type="checkbox"/> Operations Mgmt. | <input type="checkbox"/> Human Resources Mgmt. | <input type="checkbox"/> MBA |

Engineering

- | | | | |
|--|-------------------------------------|-------------------------------------|--|
| <input type="checkbox"/> Civil | <input type="checkbox"/> Mechanical | <input type="checkbox"/> Electrical | <input type="checkbox"/> Surveying & Topo. |
| <input type="checkbox"/> Chemical | <input type="checkbox"/> Computer | <input type="checkbox"/> Industrial | <input type="checkbox"/> Bioengineering |
| <input type="checkbox"/> Software Eng. | | | <input type="checkbox"/> Computer Science and Eng. |

Liberal Arts

- | | | | |
|---|--|---|--|
| <input type="checkbox"/> English | <input type="checkbox"/> Theory of Art | <input type="checkbox"/> Sociology | <input type="checkbox"/> Kinesiology |
| <input type="checkbox"/> French | <input type="checkbox"/> History | <input type="checkbox"/> Social Sciences | <input type="checkbox"/> Political Science |
| <input type="checkbox"/> Hispanic Studies | <input type="checkbox"/> Economics | <input type="checkbox"/> Psychology | |
| <input type="checkbox"/> Plastic Arts | <input type="checkbox"/> Philosophy | <input type="checkbox"/> Comparative Literature | |

Science

- | | | | |
|------------------------------------|----------------------------------|---|--|
| <input type="checkbox"/> Chemistry | <input type="checkbox"/> Biology | <input type="checkbox"/> Physical Science | <input type="checkbox"/> Biotechnology |
| <input type="checkbox"/> Pre-Med | <input type="checkbox"/> Physics | <input type="checkbox"/> Computer Science | <input type="checkbox"/> Industrial Microbiology |
| <input type="checkbox"/> Nursing | <input type="checkbox"/> Geology | <input type="checkbox"/> Marine Science | <input type="checkbox"/> Math |

How Companies Find Faculty: Areas of Expertise

Pertinent Faculty may be found by Department Majors and Websites, but not necessarily efficiently:

ACADEMIC MAJORS

**Please identify desired majors*

Agricultural Science

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| <input type="checkbox"/> Pre-Med | <input type="checkbox"/> Physics | <input type="checkbox"/> Computer Science | <input type="checkbox"/> Industrial Microbiology |
| <input type="checkbox"/> Nursing | <input type="checkbox"/> Geology | <input type="checkbox"/> Marine Science | <input type="checkbox"/> Math |

EXEMPLARY AREAS OF EXPERTISE:

- Wearables
- E-Commerce
- Sustainable Energy
- Autonomous Systems
- Emotional Intelligence
- Robotics
- Internet of Things (IoT)
- Artificial Intelligence & Machine Learning
- Precision Agriculture
- Recycling
- Ambient Control
- Natural Language Processing
- Education (K-12)
- Mobile
- Mobile Internet
- Social Media
- E-Literature
- Linguistics
- Sanitation
- Smart materials
- Digital assistants
- Soil and Water Sensing
- Vertical Farming
- Water generation and distribution
- Drones
- Blockchain
- Mixed Reality (virtual or augmented)
- Wireless Power
- Fusion and Fission
- Social Genetics
- Social Publishing
- Vegan "Meats"

How Companies Find Faculty

- Companies seek motivated Faculty by “Areas of Expertise”
- Faculty profiles – **URGENT**
 - Department Pages
 - Vivo
 - LinkedIn
 - Google Scholar

Ph.D en Ecología de Ciliados, Universidad de Guelph

Horas de Oficina (1er semestre 2019-2020)

- Martes y Jueves, 2:00-4:00pm
- Viernes, 10:00am-12:00pm
- B-321

Áreas de Interés/Especialidad

- Ecología
- Protistología
- Biodiversidad

Cursos

- BIOL 3125 (*Ecología*)
- BIOL 4025 (*El hombre y el Ecosistema*)
- BIOL 4901 (*Problemas Especiales en Biología I*)
- BIOL 4902 (*Problemas Especiales en Biología II*)
- BIOL 6689 (*Métodos de Investigación Biológica*)
- BIOL 6990 (*Tesis*)



COMPANIES EXPECT TO EASILY FIND BASIC INFORMATION OF FACULTY ON UPRM WEBSITE

Motivated Faculty Profiles are Essential

- Faculty Profiles
 - Harvard University

CATHERINE DULAC

Higgins Professor of Molecular and Cellular Biology
Lee and Ezpeleta Professor of Arts and Sciences
Howard Hughes Medical Institute Investigator



[← BACK TO FACULTY PROFILES](#)

CONTACT

► dulac@fas.harvard.edu

☎ 617-495-7893

**BL 4017 The Biological Labs 16 Divinity Ave
Cambridge, MA 02138**

[Dulac Lab Website](#)

COURSES

- **MCB 125. Molecular Basis of Behavior**
- **MCB 141. Molecular and Cellular Biology of the Senses and their Disorders**
- **MCB 344. Molecular and Developmental**

RESEARCH

Peering Into the Social Brain

Our group is using molecular, genetic and electrophysiological techniques to explore the molecular and neuronal basis of innate social behaviors in the mouse. Two major lines of research are currently being pursued in the laboratory:

We are pursuing several projects at the molecular, cellular and systems levels in order to investigate the architecture and functional logic of neuronal circuits underlying social behaviors. The key questions we are addressing are: What are the sensory signals that trigger specific social behaviors? What are the brain areas involved in processing these signals and generating species- and sex-specific behaviors such as aggression, mating, parental behavior, defensive behavior? What is the molecular identity of the neurons involved, how are they connected to each other, and how are they modulated by the animal physiological state and its previous social experience? And finally, how do circuits underlying sex-specific behaviors differ in the male and female brains?

The second set of projects explores the phenomenon of genomic imprinting in the brain, and the role of this mode of epigenetic modification in brain development and adult brain function. Genomic imprinting results

Motivated Faculty Profiles are Essential

- Faculty Profiles
 - Lehigh University



Biological Sciences

Faculty



Jennifer Swann, Ph.D.
Professor

[Director of Student Success](#)
(Arts & Sciences)
[Council for Equity and Community](#)
(Co-Chair)

Research Interest:
Behavioral Neuroscience

Iacocca Hall
111 Research Drive, D215
Bethlehem, PA 18015

610-758-5484

RESEARCH

My lab uses hormones and sex differences to tease out the secrets of the brain. Simply put if the brain regulates behavior than differences in the behavior should be reflected by differences in the brain. Males and females in a number of species display very different, sex specific behaviors, this implies that their brains are also different. Similarly hormones, particularly steroids have dramatic effects on the expression of a number of behaviors. In general, these effects take days to emerge and last for days allowing us to study the brain during the development and expression of the behavior. And steroids have two different effects in the regulation of sex specific behaviors. They “organize” the brain during development casting it as male or female, and they “activate” the brain in adulthood to allow the expression of the behavior.

Our lab has been examining the MPN mag, a small nucleus in the caudal lateral aspects of the preoptic area, that plays a critical role in male sex behavior by integrating hormonal and pheromonal signals. We have mapped the connections of the nucleus, identified subtle sex differences in neuronal cell type, and are working to determine the biochemical and sub cellular events that mediate steroidal regulation of male sex behavior. At present we are exploring the role of growth factors in mediating sex specific hormone effects on connectivity. We are also exploring the role of the olfactory system in providing efficiency that follows sexual experience.

Mv background includes studies in circadian rhythms. We have found circadian influences on adult

The Magnocellular Medial Preoptic Nucleus



Fig. 1. (A) A Cresyl Violet stained coronal section through the medial preoptic nucleus (MPN mag) of the adult Syrian hamster. (B) Schematic drawing of preoptic area of a male hamster indicating the position of the MPN mag in (A). The Cresyl Violet-stained section (A) corresponds to the boxed portion of the schematic diagram (B). The arrows in Fig. 1A mark the position of the MPN mag. (Govek et al., 2003)

PUBLICATIONS

OUTREACH

LAB MEMBERS

UPRM “Industrial” Ecosystem and Other Considerations

- Motivating Internal Perceptions / Realities
 - Departmental Diversity (Agriculture, Arts, Business, Engineering, and Science)
 - Excellent Alumni (highly sought after)
 - Excellent Faculty (smart, committed, and resourceful)
 - Plentiful & Excellent Undergraduate Students (agents of change)
 - High Educational Return on Investment
- Limiting External Perceptions / Realities
 - Rampant Violence
 - Poor Economy
 - Devastating Hurricanes

Longer Term Ecosystem Development

○ Ecosystem Needs

- More Graduate Students – RAs and TAs
- Local “Global” Companies and especially Startups
- Competitive Local Infrastructure including the City
- Level Playing Field
- Diversity?



○ Ecosystem Development

- Educate and engage students early on focused Graduate Program Tracks
- Encourage, strengthen, and grow with global companies of local origin
- Realize “real” value-based long term industrial investments (e.g. STREAM).
- Engage exported, experienced, and motivated alumni
- Utility Infrastructure: > 99.9% Water, Power, and Internet Availability
- Transportation Infrastructure: < 1h to/from Mayaguez/San Juan



Photo by [Ian Schneider](#) on [Unsplash](#).



Industrial Liaison Program: A Journey Together

Dr. José Meléndez
Industrial Liaison Officer
Special Assistant to the Chancellor
University of Puerto Rico Mayagüez

jose.melendez37@upr.edu

787-832-4040 x6570 (Office/Voice)

214-686-8896 (Text/WhatsApp)

Rectoría, Edificio José de Diego, 203A