

# Integration of Undergraduate, Graduate Students, and Undergraduate Programs' Faculty Members in a Mentored Research Experience: Enhancing Diversity and Retention

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Co-Coordinator Component 2 - Pilot Projects (PiP), Title V Project  
University of Puerto Rico, Medical Sciences Campus

**2024 HETS Best Practices Showcase**  
January 11, 2024



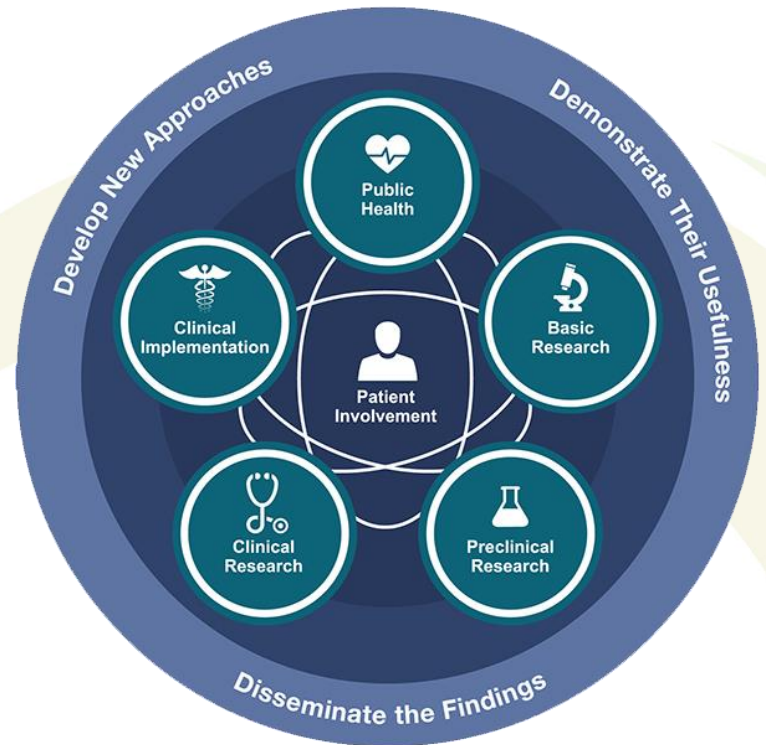
Grant #: P031S200104

# Brief Description of Title V Project

- Clinical and Translational Research with an Interdisciplinary and Entrepreneurial Approach for Students and Faculty from Undergraduate Programs in Puerto Rico
- UPR-Medical Sciences Campus
- Grantor: US Department of Education
- Grant Span: October 1, 2020 – September 30, 2025
- Total Budget: \$3 million
- Components: 2
- Grant #: P031S200104

# Aims

- Promote the development of Clinical and Translational Research (CTR) in Puerto Rico.
- Build up a cadre of students and faculty members with interest and skills in CTR that may allow their further development in the field.



Credit: National Center for Advancing Translational Sciences

# Additional Aims



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- Develop competencies in scientific entrepreneurship among students and faculty members.
- Review and develop faculty members' mentorship skills to respond better to their mentees and students.

# Aims (cont.)

- Develop online courses on scientific entrepreneurship.
- Improve the available resources of the Medical Sciences Campus Library.
- Enhance infrastructure.



# Collaborators



**Rubén García García, Ph.D.**  
Project Director  
Distinguished Professor  
UPR Medical Sciences Campus  
School of Health Professions

# Component 1

Center for Scientific Research, Entrepreneurship,  
and Scientific Collaborations (CRESCO)

Dr. Efraín Flores Rivera  
Dr. Lizbelle De Jesús Ojeda  
Co-Coordinator



**Lizbelle De Jesús Ojeda, M.A., Ed.D.**  
Co Director ,Co Coordinator Component  
1 – CRESCO, Academic Coordinator



**Efraín Flores Rivera, M.L.S., Ed.D.**  
Co Coordinator Component 1 – CRESCO



**Rodolfo Navarro Figueroa, B.S.**  
CRESCO's Information Technology Technician



# Component 2

Developmental Plan in Clinical and Translational Research (CTR)  
with an Interdisciplinary and Scientific Entrepreneurship Approach

Improve the CTR and Technological Infrastructure

Dr. Margarita Irizarry Ramírez

Dr. Maribel Campos Rivera

Co-Coordinator

# Component 2



**Maribel Campos Rivera, M.D., M.Sc., M.B.A.**  
Co-Director Component 2 - Scientific Entrepreneurship

**Margarita Irizarry Ramírez Ph.D., Master on Ethics**  
Co-Coordinator Component 1- Pilot Projects (PiP)



# Component 2 (cont.)



**Edgardo L. Rosado Santiago, R.T., M.P.H.**  
School of Health Professions Liaison  
Courses and Infrastructure



**Juan C. Soto Santiago, R.N., M.N.S., Ed.D.**  
School of Nursing Liaison  
Courses and Infrastructure

# Background (2016 – 2020)

- A previous Title V Cooperative Project between the Universidad Central del Caribe and the UPR - Medical Sciences Campus built the foundation for the current Title V Project.
  1. We had trained 16 faculty members in CTR who needed a venue to engage in research.
  2. We had trained students who also needed research projects to continue their development in CTR.
  3. New students were asking for training and research opportunities.
- Thus, in the current project, we designed the Pilot Project program (PiP) to offer CTR research opportunities.

# Pilot Project Program (PiP)

- Ample evidence that the early exposure of students to research opportunities enhances the probability of focusing their careers to be professional researchers.
- Main focus
  - Offer opportunities to health professionals and students for their development as CTR researchers in their fields, mainly focusing on health problems of the Hispanic populations.
- PiP provides resources to design and implement a pilot research project to be completed in 12-16 months.

# PiP – Participants

1. Faculty members that were previously trained in the 2016-20 Title V project (FG)
  - The PiP offers the FG resources for a research project, the organization of a research team with **students**, and the benefit of an established researcher as a mentor.
  - The FG, students, and the mentor (RM) are the team members.
2. Established researchers (ER)
  - Faculty members from any post-secondary institution in Puerto Rico that are willing to engage in CTR while also serving as team directors and mentors to:
    - a. An undergraduate program faculty member (UgF)
    - b. **Students**

# Participants (cont.)

3. A faculty member of any undergraduate program (FMUg) in any post-secondary institution in Puerto Rico
  - Team: the FMUg, **students**, and another faculty member of an undergraduate program. They may also have a mentor.
  - Develop a proposal using CTR to address health problems in the Hispanic population.

# Inclusion and Diversity

**Inclusion** across Puerto Rico of multiple

- Institutions where the FG, FMUg, or ER work.
- Institutions where the students study.
- Institutions where the UF works.

## **Diversity of**

- Research topics.
- Health professions represented in students and faculty members.
- Developmental stage as a researcher (early, mid-career, established researcher; graduate or undergraduate, student, postdoc).



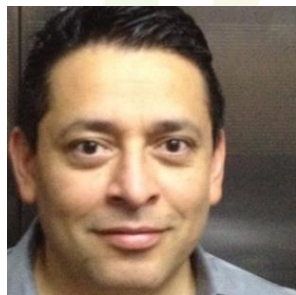
# Established Researcher (ER)

- Dr. Carlos Torres Ramos, professor at the Department of Physiology of the School of **Medicine of the Medical Sciences Campus**, is the **ER** on a project titled: **Role of Mitochondrial DNA Repair in the Maintenance of Mitochondrial Dynamics in a Human Hepatoma Cell Line**.
- This project will be developed with a team composed of Prof. Moraima Sosa Porrata, professor in the **Department of Technology in Chemical Engineering, an undergraduate program at the Technical Institute of Puerto Rico at Manatí**; Ms. Sabrina Correa Rivera, a doctoral student in the **Department of Physiology**, and Ms. Paula Barreto Ortiz, an undergraduate student from the **Department of Biology, University of Puerto Rico, Río Piedras Campus**.



# Established Researcher (ER)

- Dr. Pablo Vivas Mejías is an Associate Professor at the Department of Biochemistry of the **School of Medicine at the UPR Medical Sciences Campus** and the established researcher (ER) that will guide a team composed of Dr. Claudia Ospina Millán from Interamerican University, Bayamón Campus, Ms. Annelys Sánchez, a post-doctoral fellow at the **Puerto Rico Comprehensive Cancer Center**, and Ms. Coral Salgado Méndez, an undergraduate student at **Interamerican University at Bayamón**.
- They are developing a project titled **Genomic and Proteomic Alterations Following Treatment of Breast Cancer Cells with Simalikalactone-D**.



# Faculty Graduate (FG)

- Prof Juan Pérez Ocasio, Assistant Professor in the Radiology Technology Program at **Universidad Central del Caribe(UCC)**, submitted as a Faculty Graduate a PiP– FG titled: **“Features of Brain Magnetic Resonance Imaging (MRI) with Sucking and Swallowing Disorders in Newborns with Neonatal Encephalopathy Admitted to the Neonatal Intensive Care Unit”** .
- This project is developed by a team composed of (from left to right) Prof. Juan Pérez Ocasio; Dr. Lourdes García Tormos as Mentor; Dr. Lourdes García Fragoso, both at **University Pediatric Hospital and Dr Tormos** as undergraduate program faculty; Dr. Karla Colón Romero as a biostatistician, and Ms. Natalia Borges, an **undergraduate student at UCC**.



# Established Researcher (ER)

- Dr. Elsa Orellano Colón, professor at the Occupational Therapy Program in the **School of Health Professions at the UPR Medical Sciences Campus**. In addition to Dr. Orellano Colón, this PiP team is composed of Prof. Wency Bonilla Díaz, an instructor of Occupational Therapy at **Huertas Junior College**, and the students Mr. Jesús Mejía Castro (**UPR Humacao**) and Mr. Radamés Revilla Orellano (**UPR MSC School of Medicine**).
- They will be working on a project titled **Usability and Acceptability of an Assistive Technology WebApp for the Management of Older Adult Function**.



# Established Researcher (ER)

- Dr. Juan Carlos Jorge Rivera is a professor in the Department of Anatomy and Neurobiology, School of Medicine, University of Puerto Rico, Medical Sciences Campus.
- **Project: Clinical, Translational, and Science Education Research on Sexual Differentiation**
- **Undergraduate program faculty member:** Dr. María Inés De Jesús Burgos (UPR-Cayey)
- **Students:**
  - Frances Ortiz López, Aryana Vélez Fraguada **UPR-RP**
  - Lizbeth Vázquez Casul, **Dept Anatomy, PhD student** School of Medicine
  - Jennyvete Trinidad, Gisette Rodríguez Cintrón, Leidy Valerio Pérez **School of Medicine**

# Faculty Graduate (FG)



- Dr. Edna E. Aquino Piñero, Professor **Dept. of Microbiology and Medical Zoology, School of Medicine, University of Puerto Rico, Medical Sciences Campus**
- **Project: Characterization of Microbiota and Identification of Associated ARGs in Human Breast Milk**
- **UgF Astrid Seguí Rodríguez, School of Nursing**
- Collaborators/Mentors: Dr. Maribel Campos Rivera, **School of Dental Medicine**, and Dr. Filipa Godoy Vitorino, Interim Director **Department of Microbiology and Zoology**, School of Medicine, University of Puerto Rico, Medical Sciences Campus.
- Students: Melisa Cabrera Ruiz, **UPR - MSC School of Medicine**; Andrés Torres Ramón, **Intercampus Master in Biology MSC UPR-RP G**; Adriana Lorenzo Meléndez, School of Pharmacy; Andrea Torres Crespo, Andrea Lorenzo Meléndez, Ayton Morales Goss, **UPR - RP Biology Ug**

# Established Researcher(ER)

- Dr. Josué Pérez Santiago, Associate Researcher of Computational Biology and Bioinformatics at the **Puerto Rico Comprehensive Cancer Center** submitted a proposal to the PiP-ER program titled **The Impact of Short Chain Fatty Acids Treatment in Oral and Breast Cancers**.
- Members of this research team, besides Dr. Pérez Santiago, are Dr. Esther Peterson Reguero, **Assistant Professor of the undergraduate program of the Department of Biology, University of Puerto Rico, Río Piedras Campus**, and Felipe Soto López, **Ana G. Méndez University**, Ms. Liah Román and Mr. Angel Amaral Maisonet, **UPR-RP**.



# Faculty Graduate(FG)

- Dr. Bárbara Riestra Candelaria, Assistant Professor, Department of Anatomy and Cell Biology, **Universidad Central del Caribe**, School of Medicine, Bayamón, PR
- **Project: Sonography Evaluation of Liver Health among Pediatric Population in Puerto Rico**
- **Mentor:** Dr. Loida A. González Rodríguez, Associate Program Director – Endocrinology Training Program of **UPR School of Medicine**





# Established Researcher (ER)

- Dr. Demetrio Sierra Maldonado, Associate Professor of the **Department of Anatomy and Neurobiology of the School of Medicine at the University of Puerto Rico Medical Sciences Campus**, submitted a proposal titled **Effects of Environmental Contaminants on the Neurobiology of Avoidance Pain-like Behaviors**.
- This work will be carried out by a research team composed of Dr. Sierra Maldonado, Dr. Laura Vicente Rodríguez, UgF, **Department of Biology at UPR Cayey**, and two students from **UPR Cayey**: Paulette Vázquez Martínez and Diego Nazario Martínez.



# Faculty Member of an Undergraduate Program (FMUg)

- Dr. Maria Danet Lapiz Bluhm is a full professor nurse researcher at the **School of Nursing UT Health San Antonio, Texas**. She is the main researcher of this PiP-FMUg developing the project titled **Addressing the Physical Activity Needs of Older Adults through a Community-based Program Can Improve the Health and Metabolic Outcomes of Older Hispanic Adults and their Quality of Life**.
- The research project will be developed with a team composed of Dr. Félix Hernández Román, Assistant Professor at the **School of Nursing of UPR MSC**, and the students Wilnelis M. Montalvo Caraballo, undergraduate student, and Abdiel Gómez Santos, graduate student, both from the **School of Nursing**.



# Established Researcher (ER)

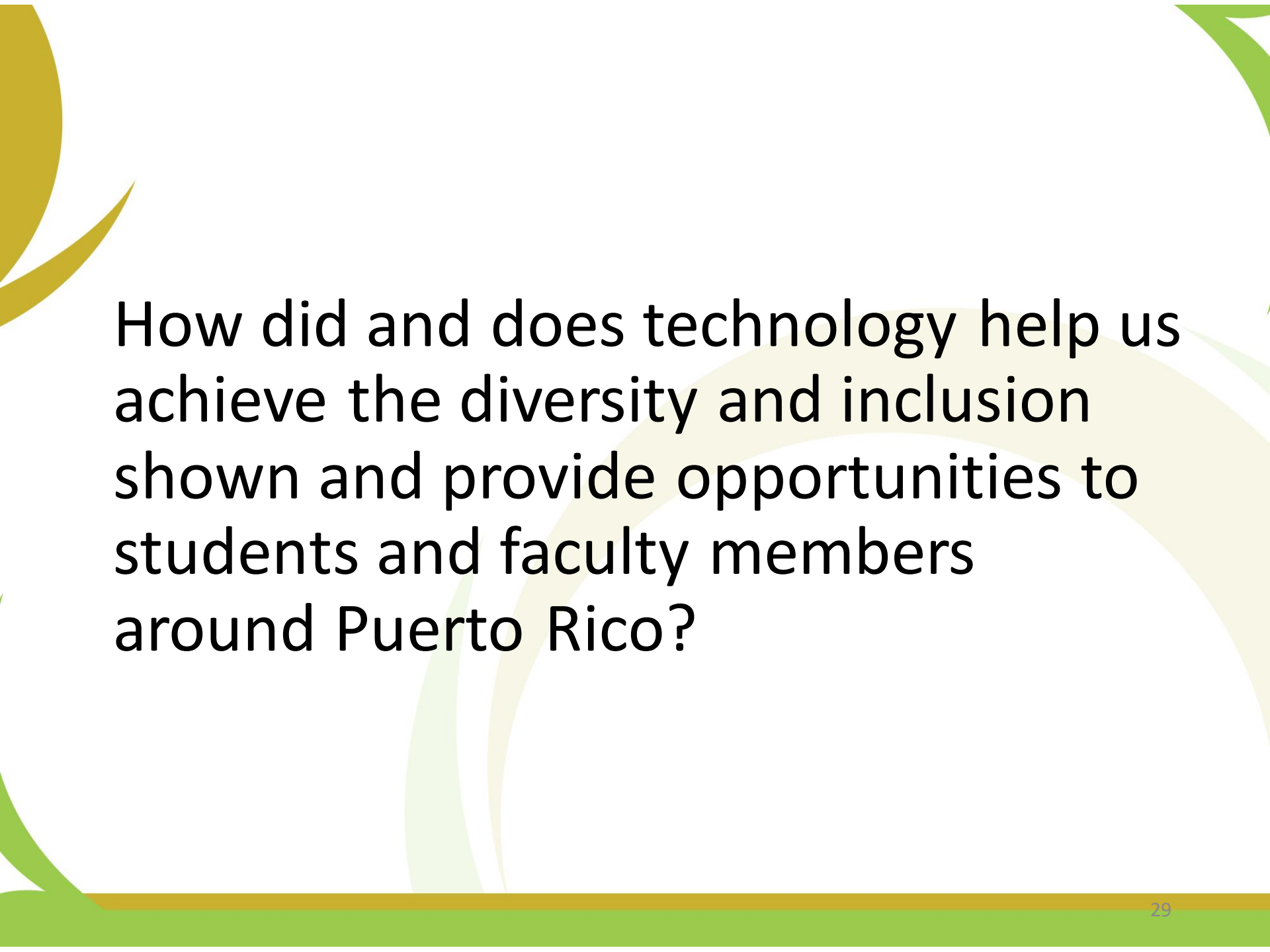
- **Training Students in Translational Research by Developing Wearable Biosensors**
- Dr. Lisandro Cunci was at the **Ana G. Méndez University** Gurabo Campus when his PiP proposal was approved. Presently, he teaches at **UPR RP Chemistry Department**.
- Dr. Catalina Dávila Auger is still at **Ana G. Méndez University**.
- Students: Yolimar Vázquez, biology student, and Antonio Espinosa, Ph.D. student at the **Ana G. Méndez University, Environmental Sciences Program**.



# Faculty Graduate (FG)

- **Closing the Gap between Reproductive Biology and Environmental Health Data: The Introduction of an In Vitro System to Study the Impact of Lead on Male Sexual Differentiation**
- **Coriness Piñeyro Ruiz, PhD, Universidad Central del Caribe, Principal Investigator (FG), Eric Miranda Valentín, MPH, DrPH, Ana G. Méndez University (UgF), Juan Carlos Jorge, PhD, UPR Medical Sciences Campus, Kelvin Omar Rodríguez Rivera, Ricardo A. Schriels Soto UPR Río Piedras Campus, Lizbeth Vázquez Cazul, UPR MSC.**





How did and does technology help us achieve the diversity and inclusion shown and provide opportunities to students and faculty members around Puerto Rico?

# COVID-19 lockdown a “blessing in disguise”

## **Solution**

- Migrate to Microsoft Teams; engage and train students and collaborators on the platform.
- Re-engineer the proposal’s programs to an online format and use a combination of Teams to adjust to comfort levels with the platforms of collaborators, lecturers, mentors, and participants.

## **Strategy**

- Continuous communication with those involved and much patience.

## **Success**

- All the participants embraced the use of the Teams platform as the primary communication venue as well as the repository for necessary documentation, progress reports, etc.

# Microsoft Teams



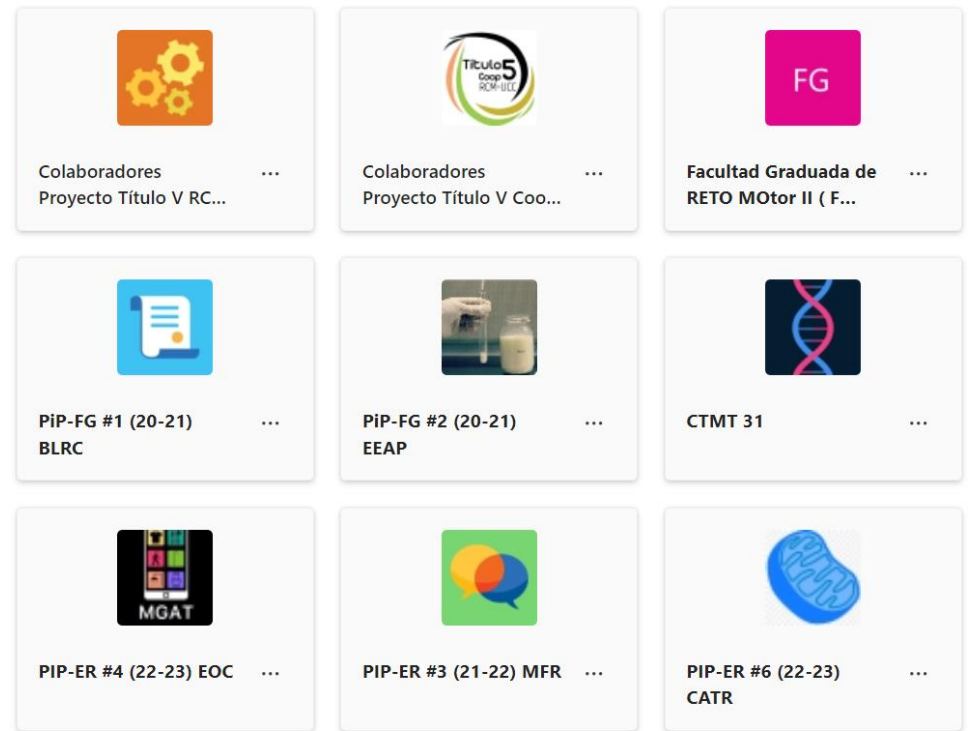
- Main communication, documentation, and general meeting place.

# Microsoft Teams










- Document repository
- Intra-team meetings
- Team members' continuous communication
- Title V project meetings
- Administration of the research teams' budgets.

## Teams

Teams



The screenshot displays a grid of nine Microsoft Teams cards. Each card features a unique icon, a team name, and a truncated description. The teams are arranged in three rows and three columns. The first row includes 'Colaboradores Proyecto Título V RC...', 'Colaboradores Proyecto Título V Coo...', and 'Facultad Graduada de RETO MOrtor II (F...'. The second row includes 'PiP-FG #1 (20-21) BLRC', 'PiP-FG #2 (20-21) EEAP', and 'CTMT 31'. The third row includes 'PIP-ER #4 (22-23) EOC', 'PIP-ER #3 (21-22) MFR', and 'PIP-ER #6 (22-23) CATR'. Each card has a three-dot menu icon to its right.

 Colaboradores Proyecto Título V RC...	 Colaboradores Proyecto Título V Coo...	 Facultad Graduada de RETO MOrtor II (F...
 PiP-FG #1 (20-21) BLRC	 PiP-FG #2 (20-21) EEAP	 CTMT 31
 PIP-ER #4 (22-23) EOC	 PIP-ER #3 (21-22) MFR	 PIP-ER #6 (22-23) CATR



# REDCap platform

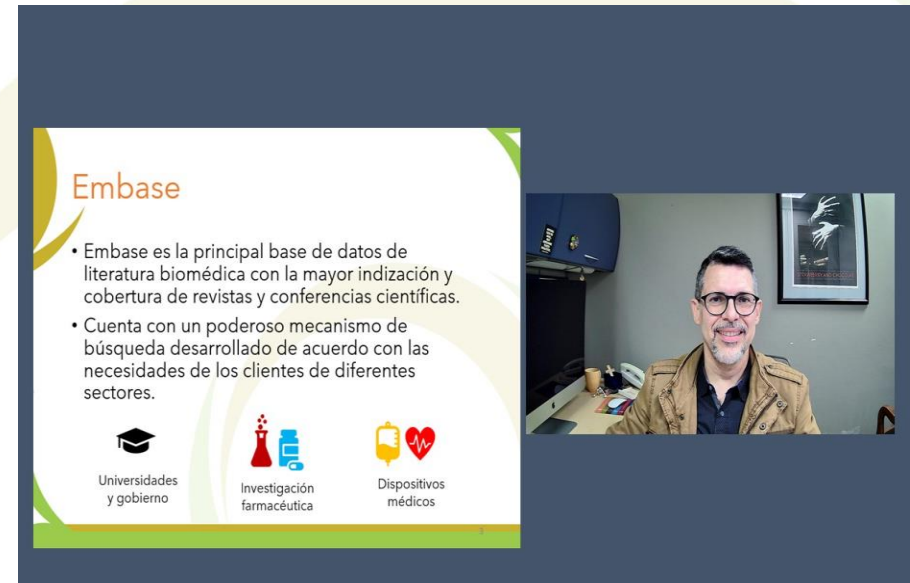
- Developed at Vanderbilt University
- PiP proposals' submission
- PiP proposals' evaluation
- Database repository and data cruncher



Research Electronic Data Capture

# CRESCO Trainings Hand in Hand with PiPs

- Workshops and tutorials:
  - a) Databases
  - b) Statistics and Intellectus Statistics
  - c) One-on-one statistics consultation online
  - d) Improvement of writing skills
    - Grammarly
    - Writefull
    - Turnitin
    - One-on-one scientific writing consultation online

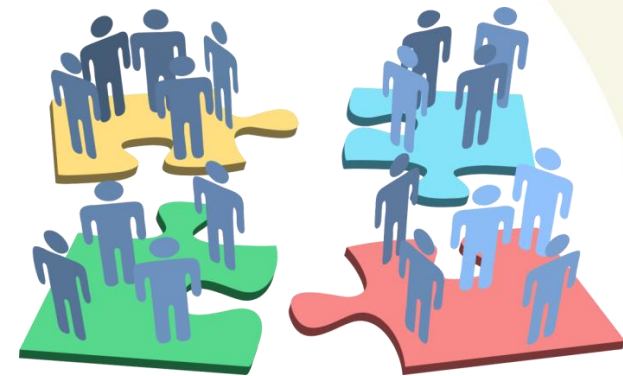


The image shows a presentation slide for Embase and a video call inset. The slide has a white background with a green and yellow decorative border. The title 'Embase' is in orange. Below the title, there are two bullet points in Spanish: 'Embase es la principal base de datos de literatura biomédica con la mayor indización y cobertura de revistas y conferencias científicas.' and 'Cuenta con un poderoso mecanismo de búsqueda desarrollado de acuerdo con las necesidades de los clientes de diferentes sectores.' At the bottom, there are three icons with labels: a graduation cap for 'Universidades y gobierno', a flask and beaker for 'Investigación farmacéutica', and a mobile phone and heart for 'Dispositivos médicos'. The video call inset shows a man with glasses and a brown jacket sitting in an office.

(Friday's session at 11:40AM in Room A4)

# PiPs by the Numbers

- Twelve (12) Research teams
- Seventeen (17) Undergraduate Students
- Twelve (12) Undergraduate Faculty Members
- Four (4) Medical Students
- Nine (9) Graduate Students
- Twelve (12 ) Primary Researchers
- Eight (8) Different Post Secondary Institutions Participating
- Zero (0) nonfunctional teams



# Conclusion

Given the tools and the opportunities, Hispanic students and faculty members will engage in productive ventures and embrace professional development activities conducive to career development and promoting persistence and continuity in their academic development.



Questions?  
¿Preguntas?