Transferencia de Tecnología en la Universidad de Puerto Rico

Jose A. Medina Cruz, JD
Director, Oficina de Propiedad Intelectual y Transferencia de Tecnología

Fecha

Science offers a largely unexplored hinterland for the pioneer who has the tools for his task.

The rewards of such exploration both for the Nation and the individual are great.

Scientific progress is one essential key to our security as a nation, to our better health, to more jobs, to a higher standard of living, and to our cultural progress.

Science The Endless Frontier, A Report to the President by Vannevar Bush, Director of the Office of Scientific Research and Development, July 1945

https://www.nsf.gov/od/lpa/nsf50/vbush1945.htm

Transferencia de Tecnología

- Proceso mediante el cual
  - una entidad externa (sector público o privado) obtiene el acceso a los avances tecnológicos universitarios
  - a través del traslado de dichos desarrollos a empresas
  - para su transformación en nuevos bienes, procesos y servicios aprovechables económicamente

(M. Del Socorro, 2006)

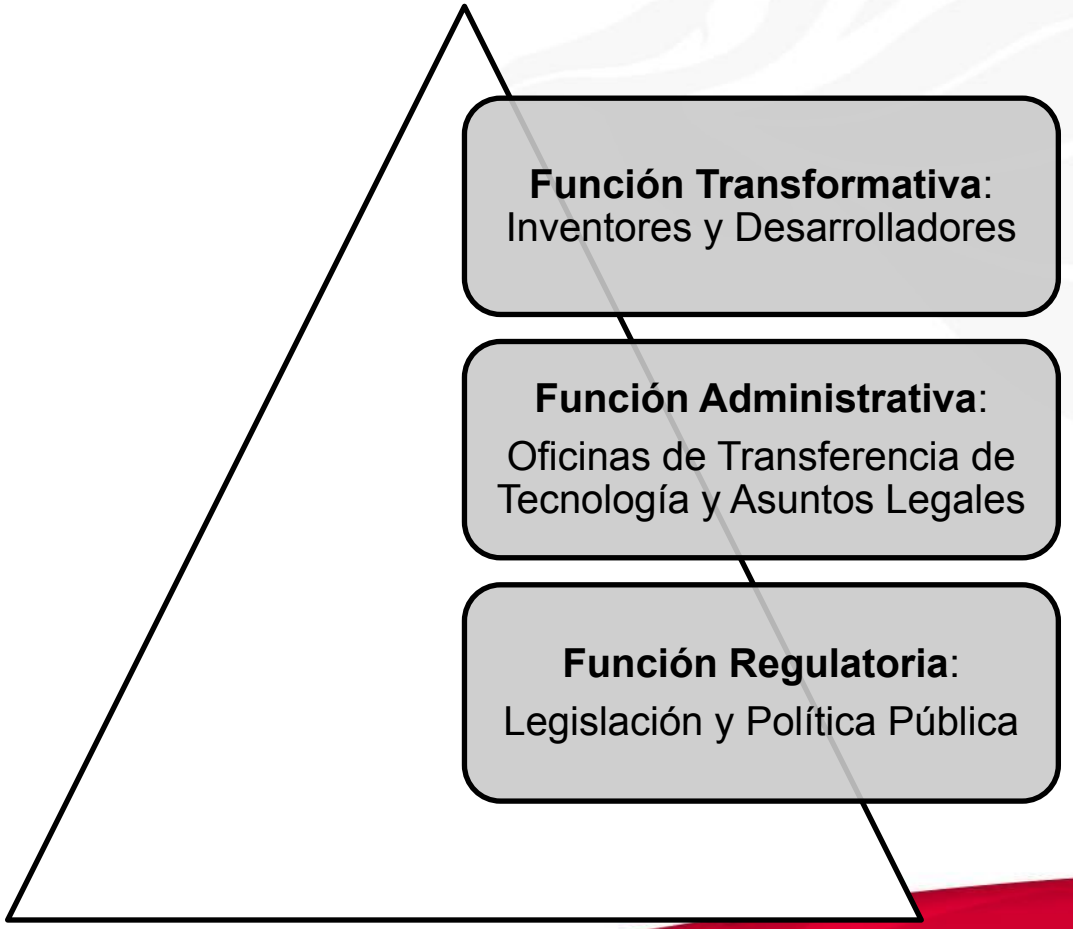
Propósito

- **<u>Posiciona a la UPR y sus miembros en una posición de influencia</u>**

- Nuevas fuentes de información que se materializan en desarrollo económico:
  - aumenta el valor reputacional
  - plantea nuevos cuestionamientos científicos
  - provee oportunidades para el desarrollo de nuevas destrezas y conocimientos (*workforce development)*
  - provee incentivos para obtención de fondos a través de acuerdos de investigación y otros
  - desarrollo de nuevos productos o servicios basados en portfolios de propiedad intelectual (licencias y regalías)

(M. Del Socorro, 2006)

¿Quiénes son parte del proceso?



Marco Regulatorio

- Bayh-Dole Act
  - Provee a la Universidad titularidad sobre las invenciones creadas en proyectos subvencionados por el gobierno federal
  - Habilita la función de transferencia de tecnología en agencias del gobierno federal
- Política sobre patentes, invenciones y su comercialización de la Universidad de Puerto Rico
  - Certificación 34 (2018-2019)
- Memorando de Entendimiento entre UPR and Puerto Rico Science, Technology & Research Trust
  https://prsciencetrust.org/techtransferoffice/

Políticas

Políticas sobre patentes, invenciones y su comercialización de la Universidad de Puerto Rico Certificación Núm. 34 (2018-2019)

Política sobre marcas y nombres de la Universidad de Puerto Rico Certificación Núm. 48 (2019-2020)

Política institucional sobre derechos de autor Certificación Núm. 140 (1992-1993)

Reproducción no autorizada de obras protegidas por la ley de derechos de autor Circular 95-01

Política Acceso Abierto Resultados Labor Creativa e Investigación Certificación Núm. 102 (2022-2023)

Policy and Guidelines Financial Conflicts Interests Commitments Research Sponsored Programs UPR Certificación Núm. 8 (2012-2013)

Modelo de Transferencia de Tecnología

Identificación de la invención

- Responsabilidad del investigador / inventor y su laboratorio
- Requiere conocimiento nominal sobre:
  - Tipos de Propiedad Intelectual (Derechos de Autor, Patentes, Marcas, Secretos de Negocio, etc.)
  - Estado del arte tecnológico
- Documentación mediante:
  - Cuadernos de investigación
  - Procesos de desarrollo (versión control)
  - Datos sometidos a agencias o colaboradores
  - Publicaciones

Modelo de Transferencia de Tecnología

Divulgación (Invention Disclosure)

- Responsabilidad del investigador / inventor y su laboratorio

https://prsciencetrust.org/techtransferoffice/

- Proceso sencillo que recoge los aspectos más generales junto con documentación que apoye la existencia de un avance tecnológico

Modelo de Transferencia de Tecnología

Evaluación del Invento

Puerto Rico Science, Technology & Research Trust | TT TECHNOLOGY TRANSFER OFFICE

CONFIDENTIAL

INVENTION STATUS

Category **Rating**

	Weight %	High	Medium High	Medium	Medium Low	Low
Scientific/Technical Review	20	X				
Development Stage	15			X		
Patentability	30			X		
Commercial Potential	20			X		
Inventor Factors	10	X				
Outstanding Issues Resolved	5	X				
Overall			X			

RECOMMENDATION

- Proceed to U.S. provisional patent
- Monitor progress for 10 months following provisional patent application

Modelo de Transferencia de Tecnología

Protección == Estrategia de Propiedad Intelectual

- Responsabilidad primaria: Gerente de Tecnología
- Equipo multidisciplinario
  - Investigación de mercados
  - Legal
  - Desarrollo Técnico
- En esta etapa se profundiza y ejecutan las estrategias identificadas en la evaluación del invento

Modelo de Transferencia de Tecnología

Promoción Tecnológica

- Plataformas Especializadas (inpart)
- Consultoría de Negocios
  - Estudios de Mercado
  - NSF i-Corps (Customer Discovery)
  - Trade Shows

Inhibitor of the Malarial GST for Overcoming Drug Resistance

Small antimalarial molecule for inhibiting Plasmodium parasite growth

Published: 14th March 2023

Source: Giovanni Cancemi, https://stock.adobe.com/uk/204394014, stock.adobe.com

Background

Malaria, caused by *Plasmodium* parasites, is one of the most critical public health challenges, representing a

Malaria, caused by *Plasmodium* parasites, is one of the most critical public health challenges, representing a problem for people residing in or traveling to warm countries with a high incidence of the disease. The Centers for Disease Control and Prevention estimates between 300 to 500 million new malaria cases and nearly 1 million deaths caused by the disease annually. Controlling the disease has been difficult due to the increasing resistance to insecticides of *Anopheles* mosquitoes, the malaria carriers. Moreover, **the increasing emergence of multidrug-resistant *Plasmodium* parasites is one of the greatest threats**.

Technology Overview

The Glutathione S-transferase (GST) enzyme is crucial for *Plasmodium* parasite survival, proliferation, and asexual reproduction. Thus it has become an attractive target for the development of therapeutic drugs against malaria. This technology offers an alternative for overcoming the challenges of multi-drug resistance in malaria treatment by the administration of the small molecule TCMDC124132, inhibitor of the *Plasmodium* GST. The compound binds to the H-site of the *Plasmodium* GST, and exhibits 50% of inhibitory activity against *Plasmodium* growth at 1.15 µM, tested in cultures of mice infected with the parasites (Figure 1).

Stage of Development

The technology readiness level (TRL) is estimated at 3.

Benefits

- Alternative method for overcoming antimalarial drug resistance
- Inhibitory activity against the Glutathione S-transferase (GST) enzyme
- More effective than standard GST inhibitors

Applications

- Malaria

Opportunity

- Exclusive license
- Non-exclusive license

Patents

- U.S. Patent 10,744,119 / Inhibitors of the Malaria GST

IP Status

- Patented

Seeking

- Development partner
- Licensing

The Business Model Canvas

Designed for:	Designed by:	Date:	Version:

Key Partners

Who are our Key Partners?
Who are our key suppliers?
Which Key Resources are we acquiring from partners?
Which Key Activities do partners perform?

MOTIVATIONS FOR PARTNERSHIPS
Optimization and economy
Reduction of risk and uncertainty
Acquisition of particular resources and activities

Key Activities

What Key Activities do our Value Propositions require?
Our Distribution Channels?
Customer Relationships?
Revenue streams?

CATEGORIES
Production
Problem Solving
Platform/Network

Key Resources

What Key Resources do our Value Propositions require?
Our Distribution Channels? Customer Relationships?
Revenue Streams?

TYPES OF RESOURCES
Physical
Intellectual (brand patents, copyrights, data)
Human
Financial

Value Propositions

What value do we deliver to the customer?
Which one of our customer's problems are we helping to solve?
What bundles of products and services are we offering to each Customer Segment?
Which customer needs are we satisfying?

CHARACTERISTICS
Newness
Performance
Customization
"Getting the Job Done"
Design
Brand/Status
Price
Cost Reduction
Risk Reduction
Accessibility
Convenience/Usability

Customer Relationships

What type of relationship does each of our Customer Segments expect us to establish and maintain with them?
Which ones have we established?
How are they integrated with the rest of our business model?
How costly are they?

EXAMPLES
Personal assistance
Dedicated Personal Assistance
Self-Service
Automated Services
Communities
Co-creation

Channels

Through which Channels do our Customer Segments want to be reached?
How are we reaching them now?
How are our Channels integrated?
Which ones work best?
Which ones are most cost-efficient?
How are we integrating them with customer routines?

CHANNEL PHASES
1. *Awareness*
   How do we raise awareness about our company's products and services?
2. *Evaluation*
   How do we help customers evaluate our organization's Value Proposition?
3. *Purchase*
   How do we allow customers to purchase specific products and services?
4. *Delivery*
   How do we deliver a Value Proposition to customers?
5. *After sales*
   How do we provide post-purchase customer support?

Customer Segments

For whom are we creating value?
Who are our most important customers?

Mass Market
Niche Market
Segmented
Diversified
Multi-sided Platform

Cost Structure

What are the most important costs inherent in our business model?
Which Key Resources are most expensive?
Which Key Activities are most expensive?

IS YOUR BUSINESS MORE
Cost Driven (leanest cost structure, low price value proposition, maximum automation, extensive outsourcing)
Value Driven (focused on value creation, premium value proposition)

SAMPLE CHARACTERISTICS
Fixed Costs (salaries, rents, utilities)
Variable costs
Economies of scale
Economies of scope

Revenue Streams

For what value are our customers really willing to pay?
For what do they currently pay?
How are they currently paying?
How would they prefer to pay?
How much does each Revenue Stream contribute to overall revenues?

TYPES
Asset sale
Usage fee
Subscription Fees
Lending/Renting/Leasing
Licensing
Brokerage fees
Advertising

FIXED PRICING
List Price
Product feature dependent
Customer segment dependent
Volume dependent

DYNAMIC PRICING
Negotiation (bargaining)
Yield Management
Real-time-Market

Modelo de Transferencia de Tecnología

Formalización de Acuerdos de Licencia

- Responsabilidad primaria: Gerente de Tecnología
- Cualquier acuerdo debe quedar en un marco:
  - Que cumpla con las certificaciones universitarias
  - Que encuentre apoyo en el

DRAFT DATED_____

FOR DISCUSSION PURPOSES ONLY

EXCLUSIVE PATENT LICENSE AGREEMENT

This agreement (hereinafter "Agreement"), effective as of this ____ day of _____, 20____ (hereinafter the "Effective Date"), is by and between the University of Rochester, an educational institution chartered by the State of New York and having its principal place of business at 601 Elmwood Avenue, Box OTT, Rochester, New York 14642 ("University") and _____, a corporation organized and existing under the laws of the State of _____ and having a place of business located at _____ _____ (hereinafter "Licensee").

1.0 Preamble

1.1 University is the owner by assignment of the Patent Rights as defined below.

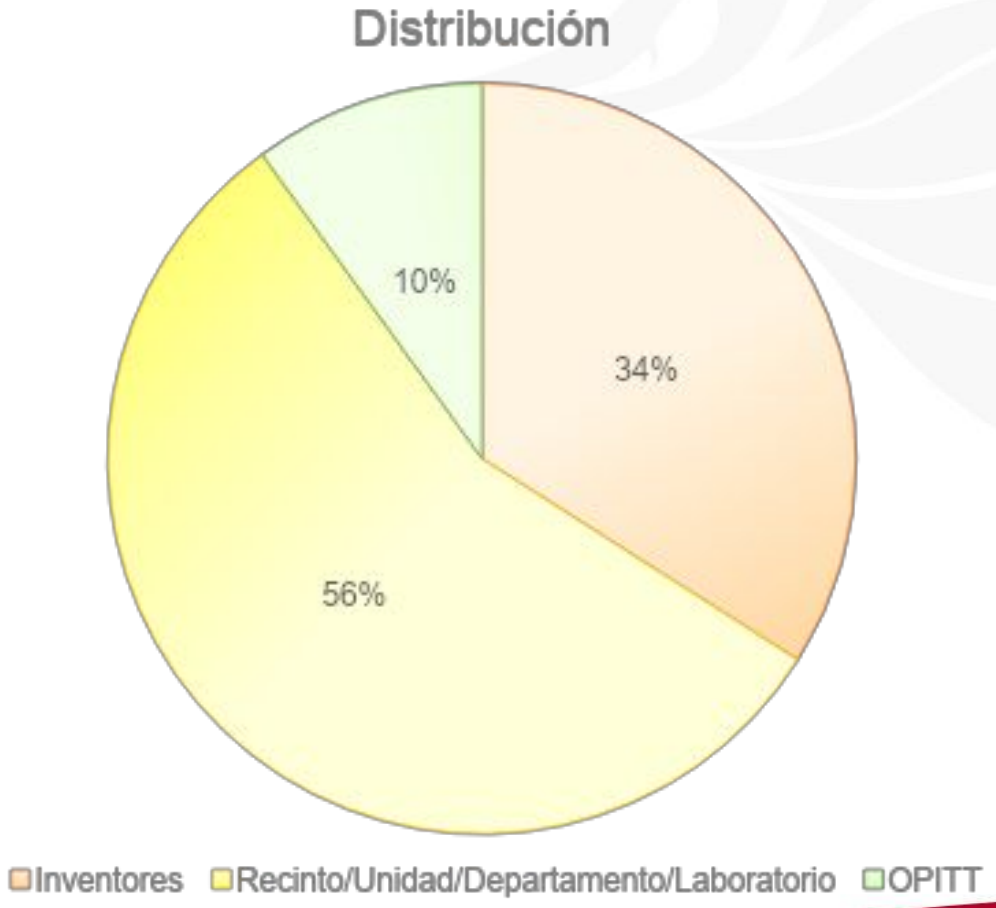
1.2 University desires that the Patent Rights be used as soon as possible for the development of products and processes for public use and benefit, and to this end desires to license the Patent Rights to a company capable of such development.

1.3 Licensee desires to acquire a license to the Patent Rights so that it can develop products and processes for public use and benefit. Licensee is under no contractual or other obligation that encumbers, restricts, or limits any of the rights granted by University under this Agreement.

2.0 Definitions

2.1 Terms defined in this Article 2.0, and parenthetically defined elsewhere in this Agreement, will throughout this Agreement have the meaning here or there provided. Defined

Distribución de Regalías (Certificación 34)



Información de Contacto

José A. Medina Cruz
Director
Oficina de Propiedad Intelectual y Transferencia de Tecnología

787-250-0000 ext 3100, 3110

jose.medina17@upr.edu

Referencias

Robert Grosse, International Technology Transfer in Services, Journal of International Business Studies (Diciembre 1996)

María del Socorro López G., Juan Carlos Mejía C. y Rodolfo Schmal S., Un Acercamiento al Concepto de la Transferencia de Tecnología en las Universidades y sus Diferentes Manifestaciones, Panorama Socioeconómico Año 24, No 32, p. 70-81 (enero-Junio 2006)

Science The Endless Frontier, A Report to the President by Vannevar Bush, Director of the Office of Scientific Research and Development, July 1945

https://www.autm.net/AUTMMain/media/About/Documents/RochesterModelExclusiveLicenseAgreement.pdf