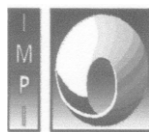


**WIPO/INV/MTY/02/8.a**

**ORIGINAL:**Spanish

**DATE:**April2002



MEXICANINSTITUTEOF  
INDUSTRIALPROPERTY



WORLDINTELLECTUAL  
PROPERTYORGANIZATION



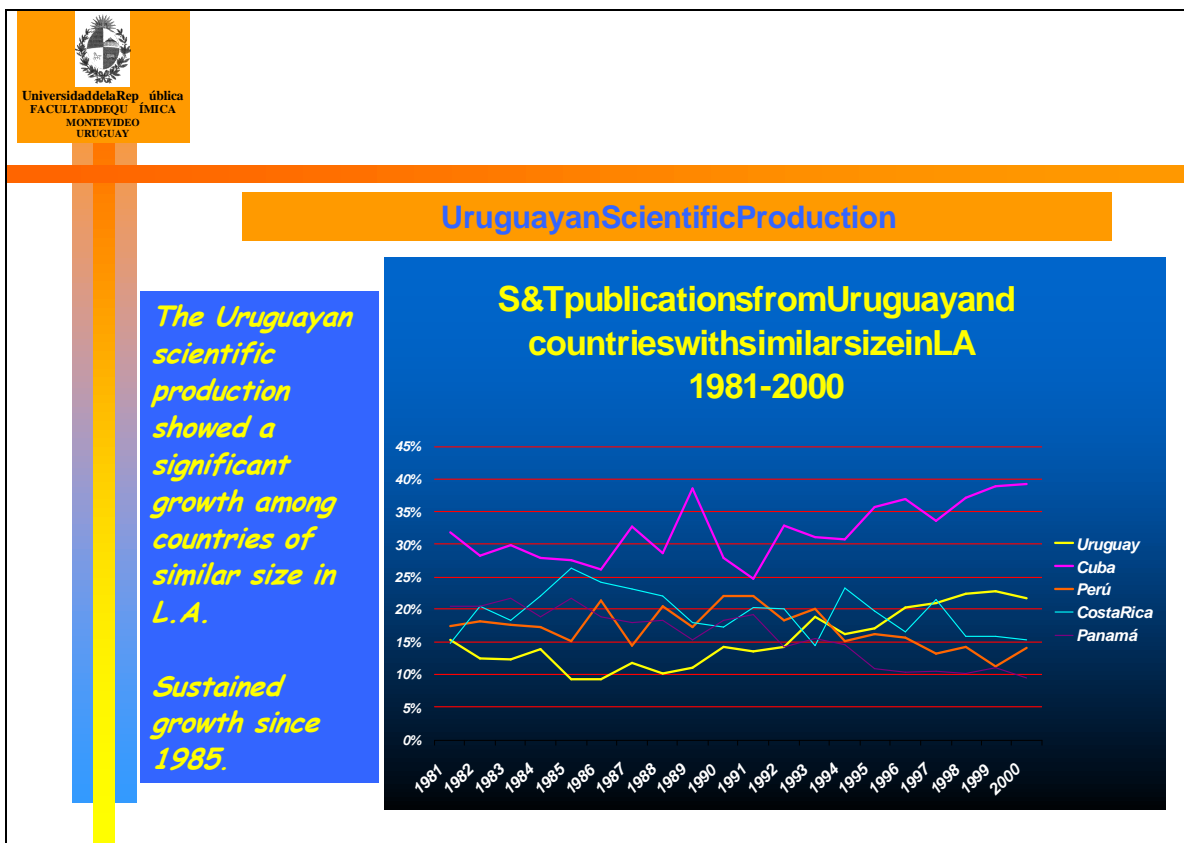
INSTITUTEOFTECHNOLOGYAND  
SUPERIORSTUDIESOFMONTERREY

**INTERNATIONALWORKSH OPON  
MANAGEMENTANDCOMME RCIALIZATIONOFINVEN TIONS  
ANDTECHNOLOGY**

organizedby  
theWorldIntellectualPropertyOrganization(WIPO)  
incooperationwith  
theMexicanInstituteofIndustrialProperty(IMPI)  
and  
theInstituteofTechnologyandSuperiorStudiesofMonterrey(ITESM)  
**Monterrey(Mexico),April17to19,2002**

TECHNOLOGYMANAGEMEN TEXPERIENCESANDLE SSONSLEARNED  
(RESPECTIVEPRACTICALCOUNTRYEXPERIENCE OFURUGUAY)

*DocumentpreparedbyDr.AlbertoNieto,Dean,FacultyofChemistry,  
UniversityoftheRepublic,Montevideo*





Universidad de la República  
FACULTAD DE ECONOMÍA  
MONTEVIDEO  
URUGUAY

### R&D FUNDING AND COUNTRY DEVELOPMENT

- ❖ Developed countries show a *larger participation of private sector both in R&D funding and activities*, as compared with L.A. countries.
- ❖ In those countries *the private demand for knowledge promotes the growth of R&D investment*, while in L.A. this process is driven by the public R&D sector.
- ❖ During the era of imports substitution, there was no private demand for knowledge in L.A.: *market protection and conception of "mature" technologies*.
- ❖ *Recent opening of national markets as well as current accelerated obsolescence of technologies did not promote so far L.A. companies to include R&D in their business strategies.*



Universidad de la República  
FACULTAD DE ECONOMÍA  
MONTEVIDEO  
URUGUAY

### GENERAL PROPOSAL

- ❖ In the *mid and long term* the educational system may promote new attitudes (entrepreneurship, risk assumption, cooperativity, transparency, professionalism) which may help to create socially responsible modern businessmen.
- ❖ In the *short term* the University may play an active role to facilitate the generation of private demand for knowledge, through strategic associations with the private sector.
- ❖ *Such a University R&D policy may promote both improved quality of life among citizens as well as an increased sustainability of University research activities and MSc & PhD programs linked to it.*



*A specific proposal from  
the University of the  
Republic in Uruguay: The  
School of Chemistry  
Promoting Entrepreneurship  
and Technology Innovation.*



SCHOOL OF CHEMISTRY-INITIATIVES-  
YEARS 2000-2001

- ❖ NEW CURRICULUM
- ❖ PROMOTING ENTREPRENEURSHIP
- ❖ CREATION OF A TECHNOLOGY-BASED BUSINESS INCUBATOR
- ❖ CREATION OF A TECHNOLOGY POLE



## SCHOOL OF CHEMISTRY - PROMOTING ENTREPRENEURSHIP


- \* In 1998, courses on "Development of Entrepreneurship Ability", given by Empretec Program.
- \* In 1999, courses on "Introduction to Technology Projects" and "Intellectual Property and Patents", given by the Office for Technology Management from the School of Chemistry.
- \* In 2000 and 2001, Workshops for technology-based entrepreneurs, given by the NGO Fundasol.
- \* In 2001 Entrepreneurship is included in the undergraduate curricula, through courses provided by Fundasol.
- \* In 2001 UNDP-funded workshop on R&D management for University scientists and managers from industry, given by a Spanish expert from Gaiker in Bilbao.



## SCHOOL OF CHEMISTRY - BUSINESS INCUBATOR

### *Characteristics:*

- *Facilitates: technology-based entrepreneurial activities*
- *Promotes spin off: staff & advanced students*
- *Virtual, although may provide location*
- *Funding partially through overheads from technology services*



Universidad de la República  
FACULTAD DE QUÍMICA  
MONTEVIDEO  
URUGUAY

**SCHOOL OF CHEMISTRY-BUSINESS INCUBATOR**

**ACTIVITIES PERFORMED**

- ❖ *Survey of potential supply of technol. services (Urutec)*
- ❖ *Survey of the market demand of those serv. (Urutec)*
- ❖ *Entrepreneurs training (Fundasol)*
- ❖ *Managerial help to entrepreneurs (Urutec)*
- ❖ *Cooperation from Propymes Network (several comp.)*
- ❖ *Ongoing creation of 13 companies (Entrepreneurs)*



Universidad de la República  
FACULTAD DE QUÍMICA  
MONTEVIDEO  
URUGUAY

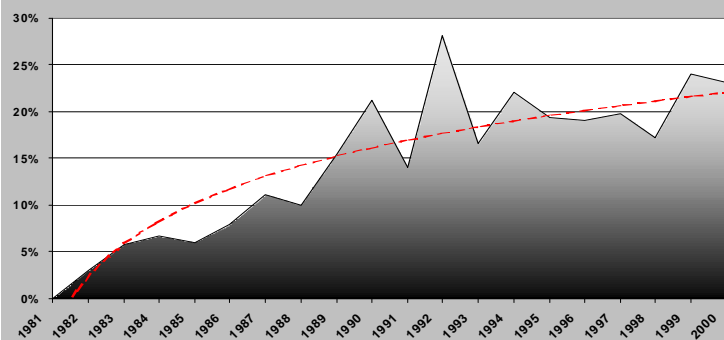
**Academic  
and Economic  
Resources**



Universidad de la República  
FACULTAD DE QUÍMICA  
MONTEVIDEO  
URUGUAY

## SCIENTIFIC PRODUCTION IN CHEMISTRY

**% of publications in Chemistry among all the scientific papers from Uruguay per year**

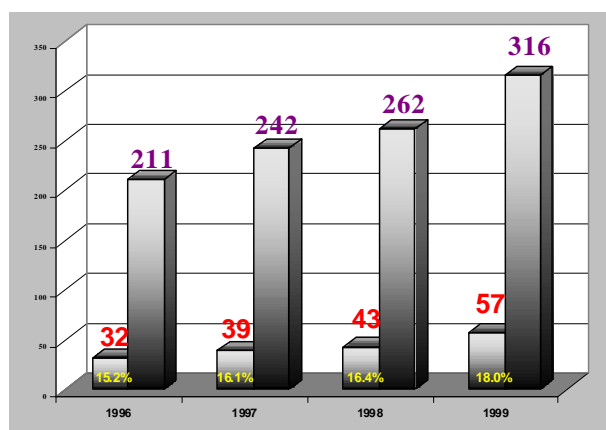


*Evolution of the number of publications in Chemistry exhibits a steady state trend, showing that 1 out of 4 scientific papers from Uruguay is related to Chemistry*



Universidad de la República  
FACULTAD DE QUÍMICA  
MONTEVIDEO  
URUGUAY

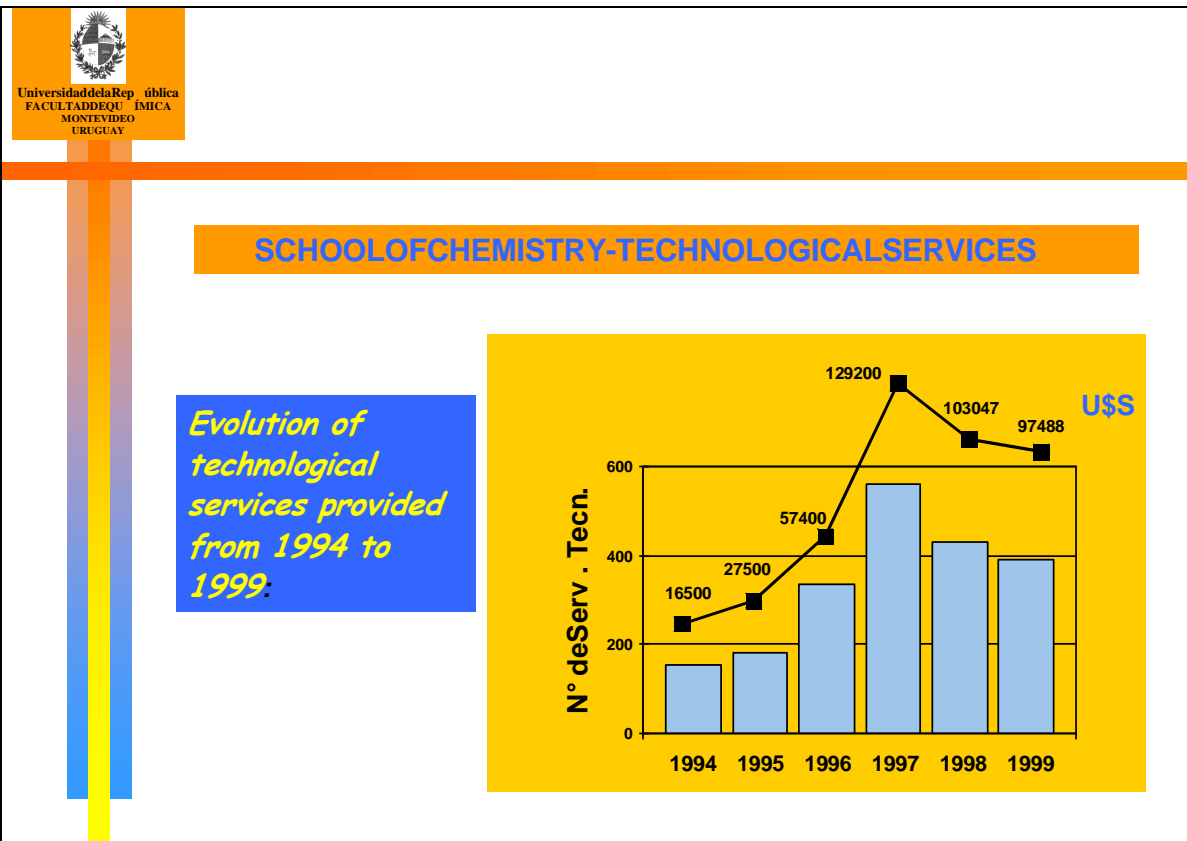
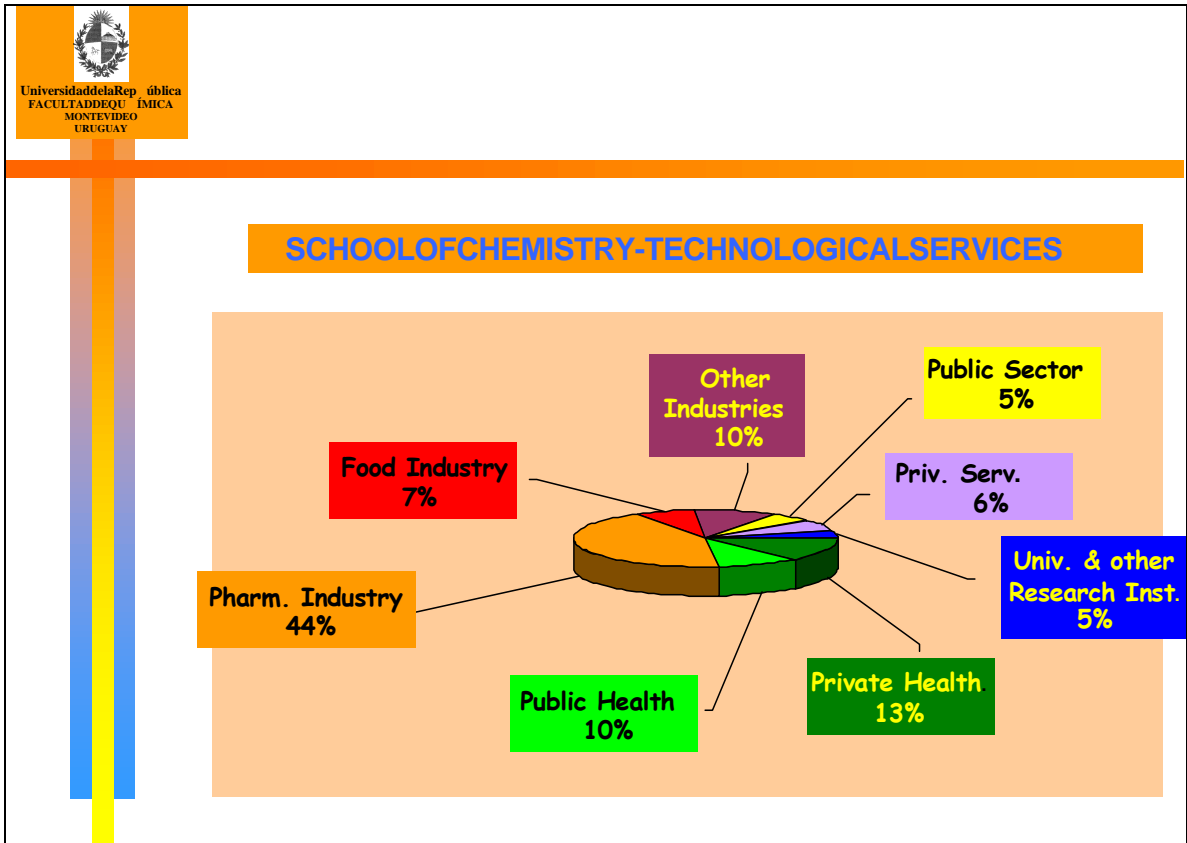
## SCHOOL OF CHEMISTRY-SCIENTIFIC PRODUCTION



*The School of Chemistry produces:*

*❖ One out of 5 Uruguayan scientific papers indexed in international data bases, with 1/50 university budget.*

*❖ 50% of the patent applications from the whole University*

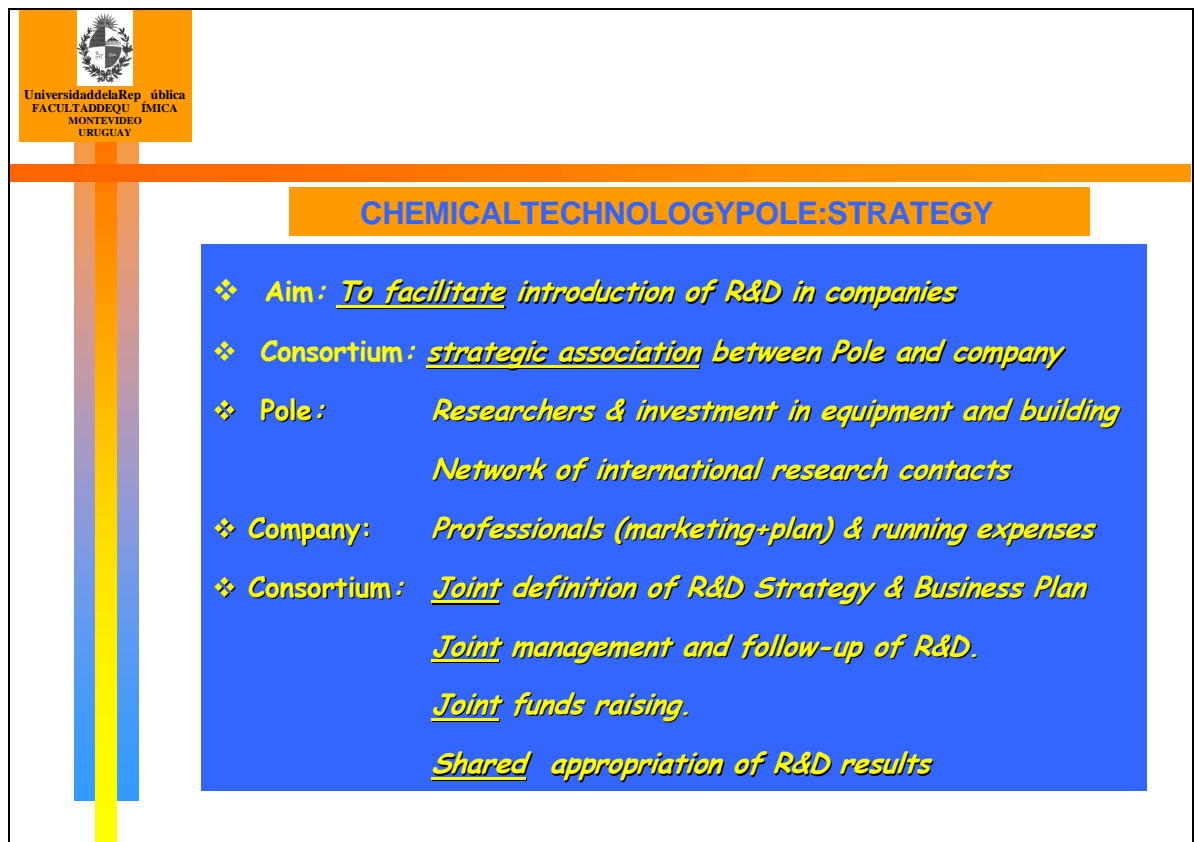
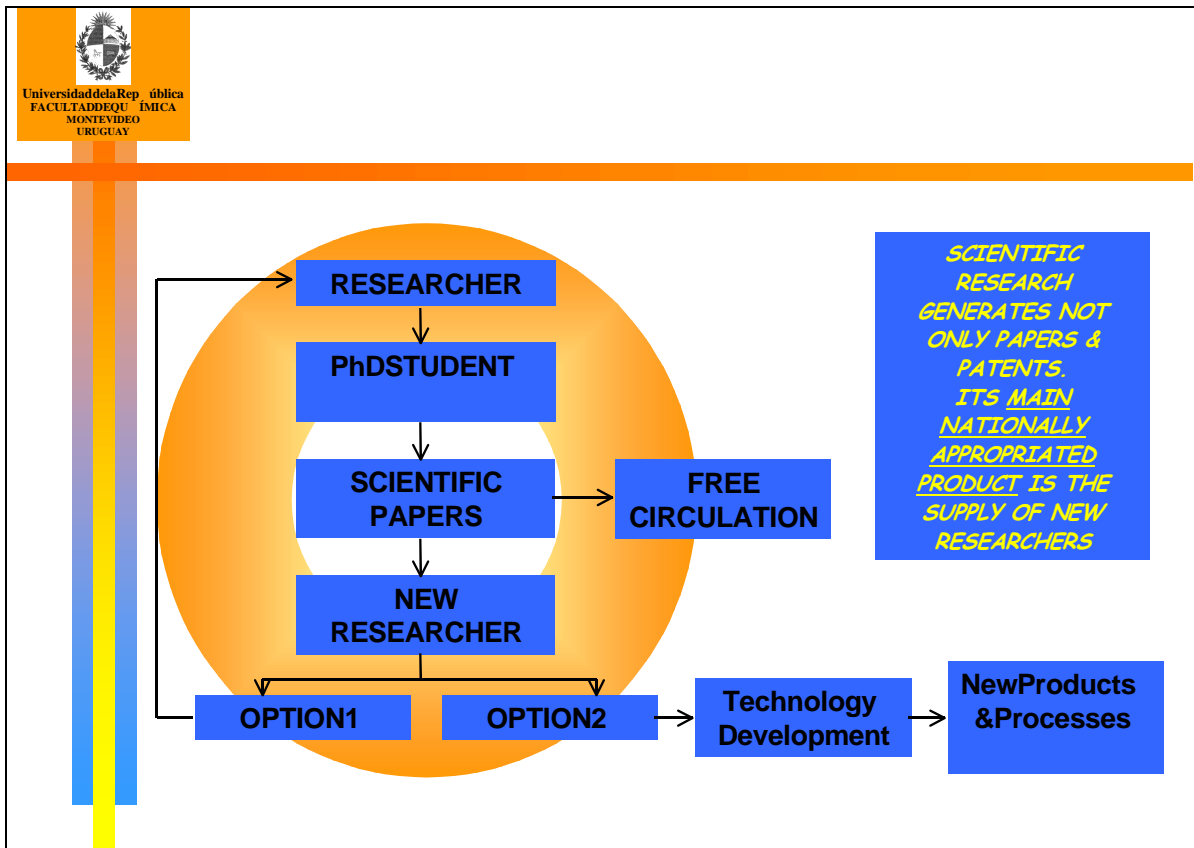




## SCHOOL OF CHEMISTRY - FUNDING

CURRENCY		U\$S			
		1998	1999	2000	TOTAL
BASIC BUDGET		2.109.931	2.109.168	1.981.414	6.200.513
<b>SUBTOTAL</b>		<b>2.109.931</b>	<b>2.109.168</b>	<b>1.981.414</b>	<b>6.200.513</b>
EXTERNAL INCOME	ABROAD	91.401	45.594	99.679	236.674
	PRIVATENAT .	167.475	237.016	147.638	552.129
	PUBLICNAT .	330.930	270.109	268.308	869.347
<b>SUBTOTAL EXTERNAL INCOME</b>		<b>589.806</b>	<b>552.719</b>	<b>515.625</b>	<b>1.658.150</b>
<b>TOTAL</b>		<b>2.699.737</b>	<b>2.661.887</b>	<b>2.497.040</b>	<b>7.858.663</b>
		22%	21%	21%	

## CHEMICAL TECHNOLOGY POLE



## STRUCTURE OF CHEMICAL TECHNOLOGY POLE

- ❖ *Technological Department of the School of Chemistry*
- ❖ *Business Incubator*
- ❖ *Center for Technology Services*
- ❖ *Consortium for Technology Strategy & Innovation (CESTI)*
  - CESTI # Private management (Fundaquim & Urutec)*
  - # Advisory Board*
  - # Executive Board (Exec. & Oper. Managers)*

## COMPOSITION OF THE ADVISORY BOARD

- ❖ *Q.F. Enrique Birenbaum (Pharmaceutical Industry)*
- ❖ *I.Q. Dante Irurtia (Wine Industry)*
- ❖ *I.Q. Andrés Lalanne (Urutec)*
- ❖ *Sr. Antonio Mallarino (Dairy Industry)*
- ❖ *Dr. Eduardo Manta (Fundaquim)*
- ❖ *I.Q. Jacinto Muxí (Resins & Paint Industry)*
- ❖ *Dr. Alberto Nieto (Fundaquim)*
- ❖ *I.Q. Ruben Ordoqui (Beer Industry)*
- ❖ *Cr. Ricardo Pascale (Financial Sector)*
- ❖ *Cr. Ricardo Zerbino (Paper Industry)*



Universidad de la República  
FACULTAD DE QUÍMICA  
MONTEVIDEO  
URUGUAY

## CHEMICAL TECHNOLOGY POLE (PANDO)



Universidad de la República  
FACULTAD DE QUÍMICA  
MONTEVIDEO  
URUGUAY

*R&D funding during the  
last 15 years in Uruguay:  
A short story*

## WHO FUNDED WHICH R&D BETWEEN 1986 & 2001?

- ❖ **INTERNAT. AGENCIES & PEDECIBA (UNDP)**
- ❖ **UDELAR:** *CSIC* Excellency-based allocation  
Support to Productive Sector  
*Agreements Policy*
- ❖ **CONICYT-IDB:** *Infrastructure, R&D and Fintec*
- ❖ **DECREASE OF EXTERNAL FUNDING**
- ❖ **EXTERNAL EVALUATION CONICYT-IDB:** *very low technology transfer*

## SCHOOL OF CHEMISTRY-STAFF STRUCTURE

Teaching staff	N° MSc	N° PhD	N° Full time	Total
Jun. Lecturers	5 (9%)	37 (64%)	16 (28%)	58 (58%)
Lecturers	1 (4%)	11 (46%)	8 (33%)	24 (24%)
Professors	0	9 (47%)	11 (58%)	19 (18%)
<b>Total</b>	<b>6 (6%)</b>	<b>57 (57%)</b>	<b>35 (35%)</b>	<b>101</b>

Universidad de la República  
FACULTAD DE QUÍMICA  
MONTEVIDEO  
URUGUAY

### SCHOOL OF CHEMISTRY-ASSISTANCE

Assistants	MSc Stud.	PhD Stud.	N° MSc	N° PhD	N° F-T	Total
Junior As.	8(8%)	0	8(8%)	0	0	106(55%)
Assistants	0	42(48%)	11(13%)	6(7%)	11(13%)	88(45%)
<b>TOTAL</b>	<b>8(4%)</b>	<b>42(22%)</b>	<b>19(10%)</b>	<b>6(3%)</b>	<b>11(6%)</b>	<b>194</b>

Universidad de la República  
FACULTAD DE QUÍMICA  
MONTEVIDEO  
URUGUAY

### SCHOOL OF CHEMISTRY-FUNDAQUIM


**Creation of Fundaquim**

Was created, as a non-profit organization, in May 1990 by the initiative of a group of researchers from the School of Chemistry

**Aims of Fundaquim**

- 1) To stimulate research, teaching, and diffusion of Chemistry and its applications
- 2) To promote the organization of activities related to such aim. As courses, seminars, research projects, etc.

FUNDACIÓ



**SCHOOL OF CHEMISTRY-FUNDAQUIM**

Agreement with Univ .

In June 1998 Fundaquim & University (School of Chemistry) signed a cooperation agreement

Agreement with URUTEC

In July 1999, Fundaquim and the consulting firm URUTEC signed an agreement to create and manage collaboratively a *Business Incubator*. In February 2000, they collaboratively obtained funding from CONICYT. to start the incubator



**FIRST ENTREPRENEURIAL INITIATIVES**

TYPE OF BUSINESS	CURRENT SITUATION	ENTREPREN. PROFILE	TYPE OF COMPANY
Citric juices	Technology development	Entrepreneur/Inventor	Unipersonal
Disposal hospital waste	Process improvement	Entrepreneur/Pharm.Chem.	Limited
PE Recycling	Project development	PhD in Chemistry	Project
Pharm. Biotech	Company development	PhD in Biochem.	Limited
Plague control	Protocol improvement	Veterinarian	Limited
Dispos. Indust. waste	Service development	Chem. Eng.	Limited
Mushroom products	Creation company	University students	Project
Diagnostic kits (Mol. Biol.)	Company development	PhD in Biochem.	Limited
Oil recycling	Adding value to waste	Chem. Eng.	Unipersonal
Services to Pharm. Comp.	Improvement of services	Pharm. Chem. & Assoc.	Project
Didactic materials prod.	Product improvement	Entrepreneur	Limited
Diagnostic kits (immun )	Project development	Biochem & Pharm. Chem	Project