

Life Sciences Symposium: Public Sector IP Management

IP Policy at the Cuban Biotechnology

Geneva, 15 December 2008



Cuba: Some Current Data

Population:	more than 11 millions
Literacy:	almost 100%
Primary education (up to 12 years old):	almost 100%
Secondary education (up to 15 years old):	99.7%
Students (all systems):	2.8 millions

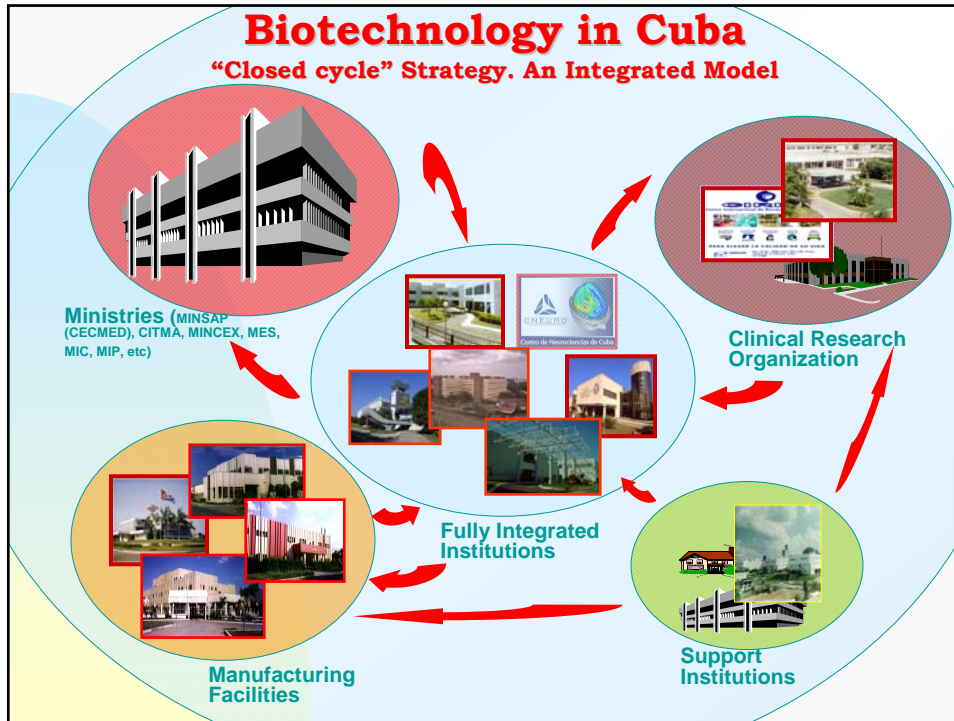
Doctors per inhabitant:	1:179
University centres:	59
Scientists:	>12,000 (15% PhD)
Research institutions:	210 (> 30,000 workers)
GNP expenditure:	1.9

Cuban biotech is supported by the high standard in health and education combined with the governmental priority to this sector

Strategy of Cuban Biotechnology

- **Cuban Government: a Huge Investment**
- **Biotechnology** is part of the Health Care System Program.
- **Based on Cuban scientists and professionals.**
- **Health Care System Program as first priority**
- **“Closed cycle” strategy: fully integrated institutions,** from research to post-marketing follow-up.
- **National collaboration instead of individual competition;** coordination between institutions doing R & D and institutions applying results.
- **“Spin off” companies** derived from scientific or production Institutions.
- **Gaining international competitiveness:** quality, production volumes, cost, novelty, joint ventures.
- **Intensive building capacity:** R & D, Production and Marketing.





Center for Genetic Engineering and Biotechnology

Founded in 1986, leadership of Cuban Biotechnology

Personnel: 1 371

Facilities: 70 000 m²

Installation qualified by WHO

A broad technological support: recombinant protein, synthetic polysaccharides, peptides, viral and DNA vectors, recombinant antibodies fragments, genomics, proteomics, and bioinformatics

Strong R+D pipeline, covered by patents, focused on infection diseases, cardiology, cancer, nutrition, autoimmunity, agbio, etc

Research Focus:
Vaccines, pharmaceuticals, diagnostics, plant and animal biotech

How to protect the investments for the Cuban biotech developing?

1. Developing of Human Resources based on Cuban scientists and professionals
2. Fully integrated institutions from research to post-marketing follow-up
3. Clearly defined objectives
4. Combines off-patent product (Hepatitis B vaccine, interferons) and innovative compounds (streptokinase, synthetic Hib vaccine)
5. **Strong IP policy that allow the protection of the innovative results and developing of a solid technological platform**



Why an IP policy?

1. 1995. Foundation of WTO. TRIPS Agreements
2. New IP policies from Free Trade Agreements
3. High levels of international competitiveness
4. Monopoly of the market by a few and powerful biotech and pharmaceuticals companies
5. Necessity of protection of the national market



TRIPS Agreements

- ❖ Patents for any inventions, whether products or processes, in all fields of technology
- ❖ The minimum rights must be conferred by a patent include offering for sale and importing the patented product
- ❖ Burden of proof for Process Patents
- ❖ The available term of protection must expire no earlier than 20 years from the date of filing the patent application



For what purpose an IP policy?

1. Protection of the national market
2. Protection of the Cuban Science developing
3. Protection of the foreign market for Cuban biotech products
4. Guarantee of legal protection to offer competitive projects safe of infringements



More relevant items of the CIGB IP policy

1. IP Strategies for each research project
2. Frequently patentability analysis for all R+D results and before any publication
3. No sell patents. Looking for another forms to patent negotiations
4. Using of patent information as important part of the State of the Art
5. Know how as an important form of IP protection



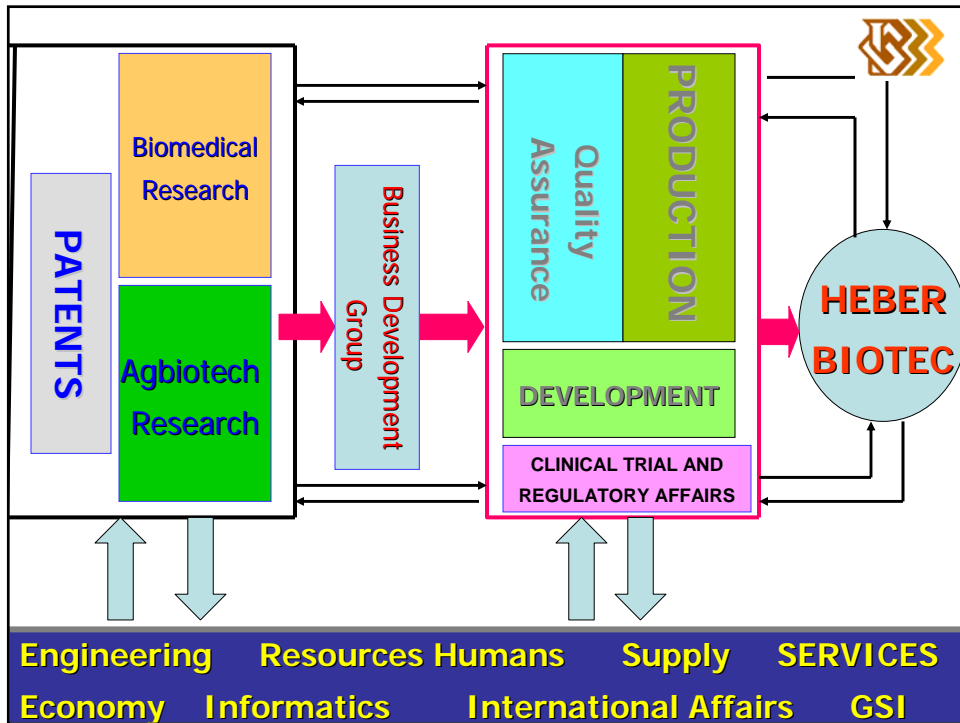
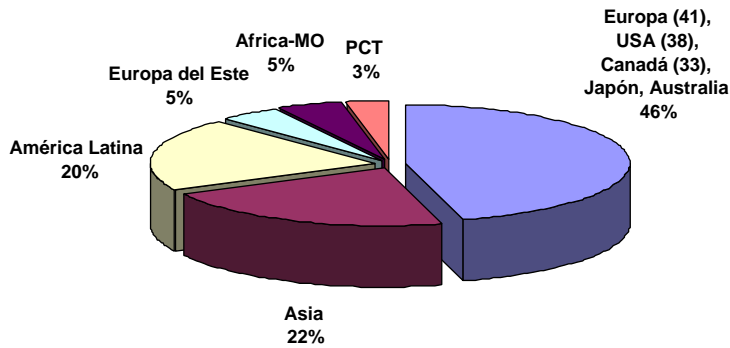
Where are focusing our IP?

- Most important markets of the subject matter
- Countries of high level biotech and pharmaceuticals technology



CIGB Patents 2008

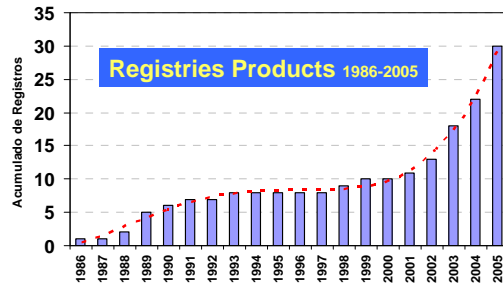
130 patents filed in Cuba and 80 inventions in other countries with more than 1,000 patent applications



Commercial Products CIGB

131 Registers in 57 countries

Exportations to 45 countries (2007)



1981-1990

1. Leuferon
2. Hebertrans
3. Heberon alfa R
4. Hebermin
5. Diagnostics
6. Heberbiovac HB

1991-2000

1. Heberkinasa
2. GAVAC
3. Heberon GammaR
4. Heberon alfaR

2001-2007

1. Heberbiovac HB w/o tiomersal
2. Heberbiovac HB Uniject
3. Quimi-Hib
4. Trivac HB (DPT+HB)
5. Heberon alfaR Liq. w/o Alb.
6. Heberon alfaR Lio. w/o Alb.
7. Heberviron
8. Heberviron Lio.
9. Heberkinasa w/o Alb.
10. Hebervital (GCSF)
11. Heberitro (EPO)
12. Acuabio I
13. Hebervis
14. Bivalent-Vaccine HB-Hib
15. Penta-Vaccine DPT-HB+Hib
16. Heberprot-P
17. IFN in Gel
18. HeberNem. Bionematicide



The CIGB's Biomedical pipeline

Project	Area	Lab	PI	Preclin.	Phase I	Phase II	Phase III	Approval
Heberprot-P	Wound healing							
HBV vaccine NASVAC	Infectious							
HCV vaccine CIGB-230	Infectious							
CIGB-500 Cytoprot. agent	Cardiovascular							
CEA recombinant antibody fragment CIGB-M3	Cancer							
HPV vaccine	Cancer							
Prostate cancer vaccine	Cancer							
CIGB-370 (anti-tumor agent)	Cancer							
CIGB-166 (anti-VEGF antibody)	Cancer							
CIGB-247 (VEGF vaccine)	Cancer							
CIGB-552 (anti-tumor peptide)	Cancer							
Dengue vaccine	Infectious							
Dengue anti-viral molecules	Infectious							
CIGB-845 (neuro-protective agent)	Neurology							
Peptide for Rheumatoid Arthritis	Autoimmunity							

The CIGB's Agriculture pipeline

Project	Area	Research	PI	Development Pilot Scale	Parcel	National Extension
Acuabio 1	Aquiculture					
Monosex Tilapia	Aquiculture					
Hebernem	Agriculture					
Biopharming	Agriculture					
Swine classical fever vaccine	Agriculture					
Rabbit hemorrhagic disease vaccine	Agriculture					
FOS	Functional food					
Acuabio 3	Aquiculture					



How are we negotiating the IP?

WHAT ARE WE

LOOKING FOR!

- ❖ Project specific alliances
- ❖ Booster ongoing projects
- ❖ Risk capital
- ❖ Access to “North” Markets
- ❖ Sharing rights to use patents

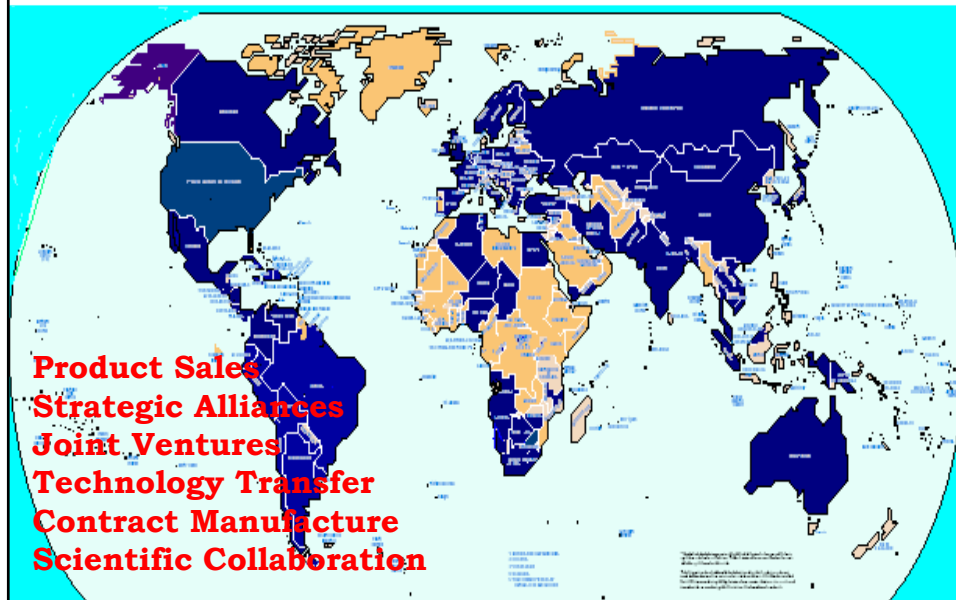
NOT LOOKING FOR!

- ❖ Broad unspecific alliances
- ❖ Offer scientific capacity
- ❖ Money loans
- ❖ Sharing our current Markets
- ❖ Selling patents

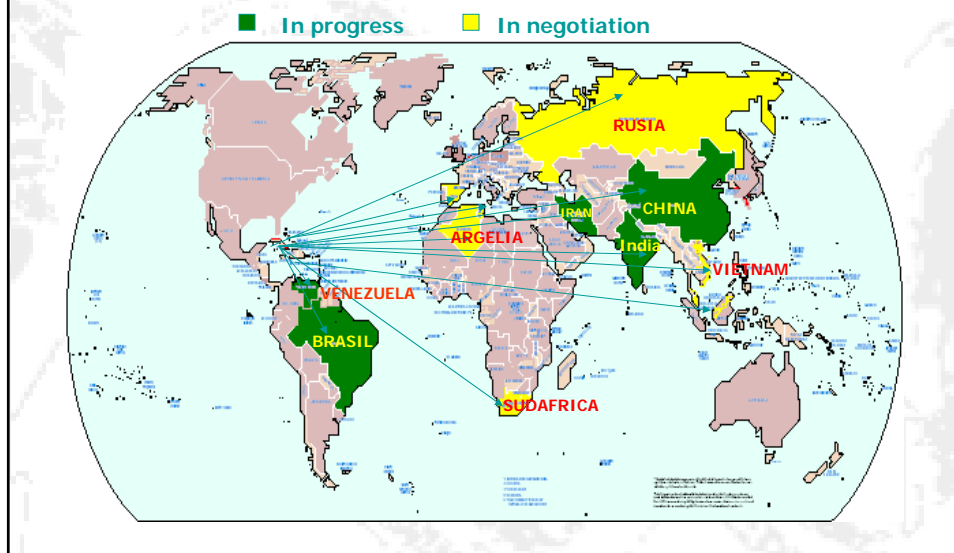
The CIGB's Project Negotiation Policy

1. Each project will be the subject of a separate negotiation.
2. After statement of willingness of a potential partner to start discussions; a secrecy agreement will be signed and then additional information could be disclosed about the product.
3. A negotiation team will be set up in order to discuss in detail the status of the technology, the patent situation, the financial requirements, the competition, the market estimations, the time schedule and the risks.
4. In general, the partner will share development costs according to a structure of up-front fees, R&D funding and milestone payments to be discussed, and will receive in exchange marketing rights for a given territory and period of time.
5. Neither equity purchase nor sharing of Cuban tangible asset property will be included in the agreement.
6. Except for the above-mentioned statement, negotiations should be flexible and innovative enough to accommodate very diverse business structures.

West Havana Scientific Pole International Activities

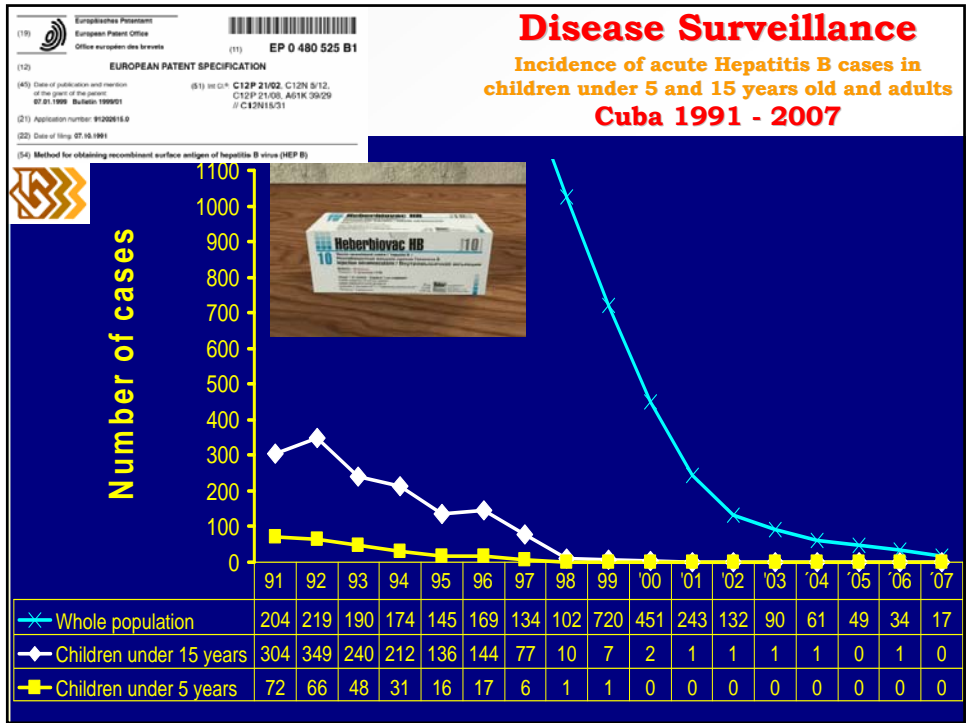


Technology Transfer Projects of the Cuban Biotechnology



TRANSFER TECHNOLOGY





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TERIMA-2: National Extension of Thrombolytic Treatment with Recombinant Streptokinase in Acute Myocardial Infarct in Cuba

Group of Investigators

HEBERKINASA

•Product developed at CIGB, with IP.

•Used in more than 35 000 patients with acute myocardial infarct (AMI) since 1992.

•28% AMI mortality reduction. 200 – 400 lives saved per year.

•Since 2003, pre-hospital use has increased its coverage and prompt use, thus improving its impact.

Science GLYCOBIOLOGY **Synthetic Vaccine Is a Sweet Victory for Cuban Science**

(19) Organización Mundial de la Propiedad Intelectual Oficina internacional (43) Fecha de publicación internacional 8 de Marzo de 2001 (08.03.2001) (10) Número de Publicación Internacional WO 01/16146 A1

Quimi – Hib®

Advantages:

- Product obtained by chemical synthesis
- Only in class worldwide
- Support by a Canadian and Cuban patent

...an in-...
...En-...
...l this...
...inally...
...gener-...
...ater an antibody response comparable to that...
...of existing vaccines. The potentially cheaper...
...uban vaccine could help the World Health...
...rganization reach its goal of vaccinating all...
...hildren against Hib, notes Roy.

Cuba is working on other synthetic vaccines, including one against the *pneumococcus* bacteria that cause pneumonia, Hernández-Santana says. Indeed, the Hib example will spur "a major move in the entire area of carbohydrate-conjugate vaccines" for diseases ranging from staph infections to malaria and AIDS, predicts chemist Peter Aeberger of the Swiss Federal Institute of Technology in Zürich.

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...uban can-...
...ugh," says...
...ences Inc...
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...for a biological product, according to Allan.

Biotech experts say they expect much more from Cuba in the coming years. "Their pipeline is very, very deep now," says James Larrick, a biotechnology entrepreneur in Palo Alto, California. "It's gone into an adolescence and it's looking pretty good."

—JOCELYN KAISER

...gasp, teamed up with chemist René Roy of the University of Quebec in Canada and spent 2 years streamlining the synthesis of Hib sugars—for example, making an eight-unit oligomer in a single reaction rather than in 16 steps.






HEBERPROT-P. An alternative to enhance diabetic ulcers healing and to reduce limb amputations

(12) SOLICITUD INTERNACIONAL PUBLICADA EN VIRTUD DEL TRATADO DE COOPERACIÓN EN MATERIA DE PATENTES (PCT)

(19) Organización Mundial de la Propiedad Intelectual Oficina internacional (43) Fecha de publicación internacional 3 de Julio de 2003 (03.07.2003) (10) Número de Publicación Internacional WO 03/053458 A1

(54) Title: USE OF A PHARMACEUTICAL COMPOSITION CONTAINING EPIDERMAL GROWTH FACTOR (EGF) FOR DIABETIC FOOT AMPUTATION PREVENTION

Group	75 ug/dose	25 ug/dose
N	23	18
Limbs preserved	21 (91.3%)	13 (72.2%)
Unresponsiveness	2 (8.7%)	5 (27.7%)

Time 0 (before) 5 weeks 3 months follow-up



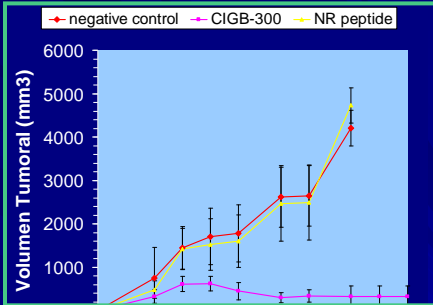



CIGB-300: Antitumoral Peptide



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 (43) Fecha de publicación internacional 11 de Julio de 2002 (11.07.2002) PCT (10) Número de Publicación Internacional WO 02/052934 A2

- Relevant target for treating cancer with potential application on solid tumors
- Phase I on going

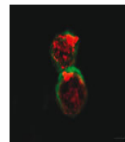


Cancer Research Highlights Selected Articles from the October 1, 2004 Issue

1. CIGB-300 is the first inhibitor substrate (CK2) with potential application in solid tumors
2. Highlight the CK2 pathway as a relevant target for treating cancer

Proapoptotic Antitumor Peptide Impairs CK2 Phosphorylation

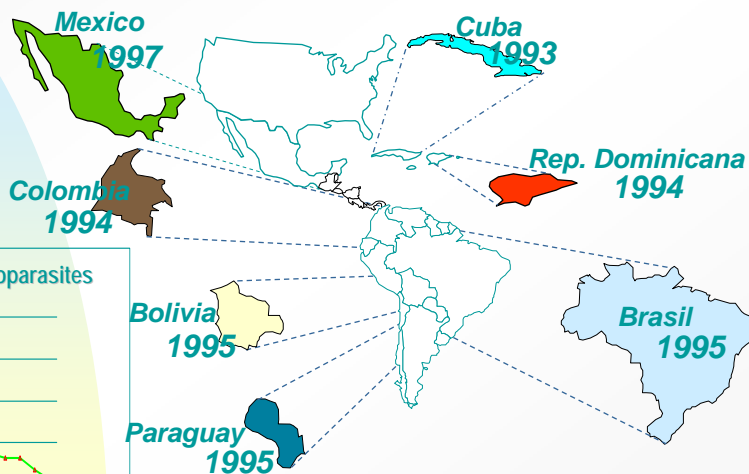
Perea et al. Page 7127



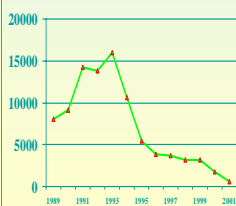
Protein kinase CK2 counteracts with apoptosis and is frequently dysregulated in human tumors. Perea et al. provide a proof-of-concept that a peptide which blocks CK2 phosphorylation by targeting the substrate exhibits anti-tumor properties. The novel peptide, which was identified by screening a cyclic peptide phage display library, induced rapid caspase activation, cytotoxicity in various tumor cells, and a vigorous antitumor effect in an animal model. Their research identifies the first CK2 substrate inhibitor that could be successfully used to treat solid tumors and highlights the CK2 pathway as a target for cancer intervention.

Rec. tick vaccine GAVAC

Patent CU 56/91. "Procedimiento para la obtención de un antígeno de garrapata en la levadura de *Pichia pastoris* y preparado vacunal obtenido"



Mortality by Hemoparasites



Bionematicide HeberNem

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PCT

(10) Número de Publicación Internacional
WO 02/052934 A2



HeberNem

Basamid

Non treated



**THANK VERY MUCH
FOR YOUR ATTENTION**

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