



“INNOVATIVE THERAPEUTIC CANCER VACCINES IN CUBA: AN UPDATE”

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Cancer remains as an unmet medical need

Estimated and Projected World Cancer Incidence by Selected Types of Cancer

Cancer Incidence (in thousands)												
Year	Lung	Breast	Colon	Stomach	Liver	Prostate	Cervical	Esophageal	Lymphoma	Pancreatic	Melanoma	
2005	1 352	1 200	1 025	935	627	680	492	463	364	233	160	
2020	1 700	1 400	1 300	1 150	680	1 280	530	480	380	264	177	
Percent Change (2005-2020)												
	1,5 %	1,0 %	1,6 %	1,4 %	0,5 %	4,3 %	0,5 %	0,2 %	0,3 %	0,8 %	0,7 %	

Estimated and Projected World Cancer Mortality by Selected Types of Cancer

Cancer Mortality (in thousands)												
Year	Lung	Breast	Colon	Stomach	Liver	Prostate	Cervical	Esophageal	Lymphoma	Pancreatic	Melanoma	
2005	1 180	410	529	700	598	222	274	386	195	227	41	
2020	1 100	400	620	730	632	245	190	395	200	243	43	
Percent Change (2005-2020)												
	-0,5 %	-0,2 %	1,1 %	0,3 %	0,4 %	0,7 %	-2,4 %	0,2 %	0,2 %	0,5 %	0,3 %	

Source: US Census Bureau , NCI, WHO

New Cases of Cancer (2006) and Mortality (2008) in Cuba (greatest frequency types)

Localization	Incidence	Mortality
Lung cancer	4 378	5 051
Prostate Cancer	2 527	2 509
Breast cancer	2 496	1 357
Colon cancer	1 683	1 869
Cervical cancer	1 271	457

Source: National Cancer Registry and Department of Statistics. Cuban Health Ministry

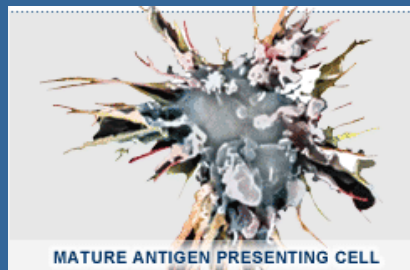


The first cancer vaccine is now available for patients

FDA Approves Prostate Cancer Treatment

NBC Nightly News (4/29, story 3, 2:00, Williams) reported that "the FDA has approved" Provenge (sipuleucel-T), "a vaccine for prostate cancer."

Dendreon
Targeting Cancer, Transforming Lives™



DAY 1
LEUKAPHERESIS



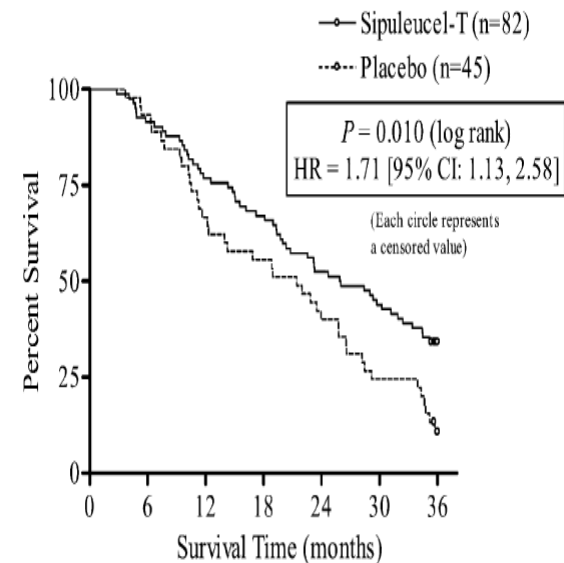
DAY 2 - 3
SIPULEUCEL-T IS
MANUFACTURED



DAY 3 - 4
PATIENT IS INFUSED



COMPLETE COURSE OF THERAPY:
3 CYCLES
In 4 weeks



Cuban Biotechnology in Cancer Vaccines

CIM



CIGB



I. FINLAY



CQB



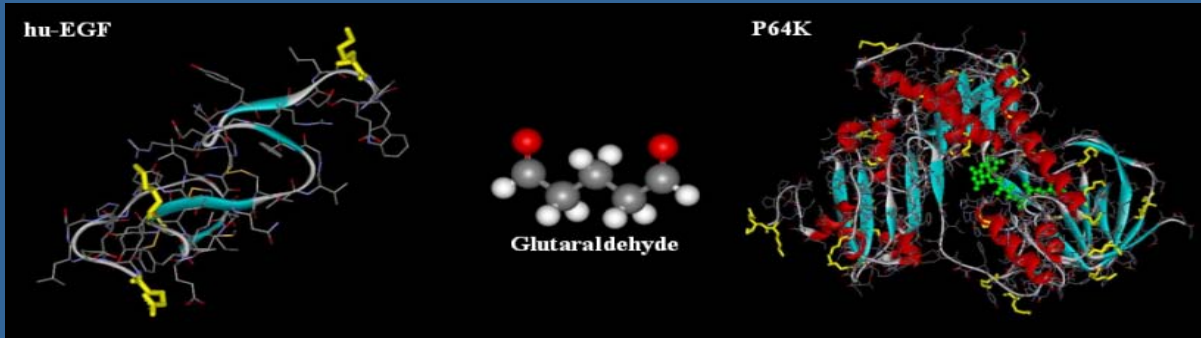
BioCen



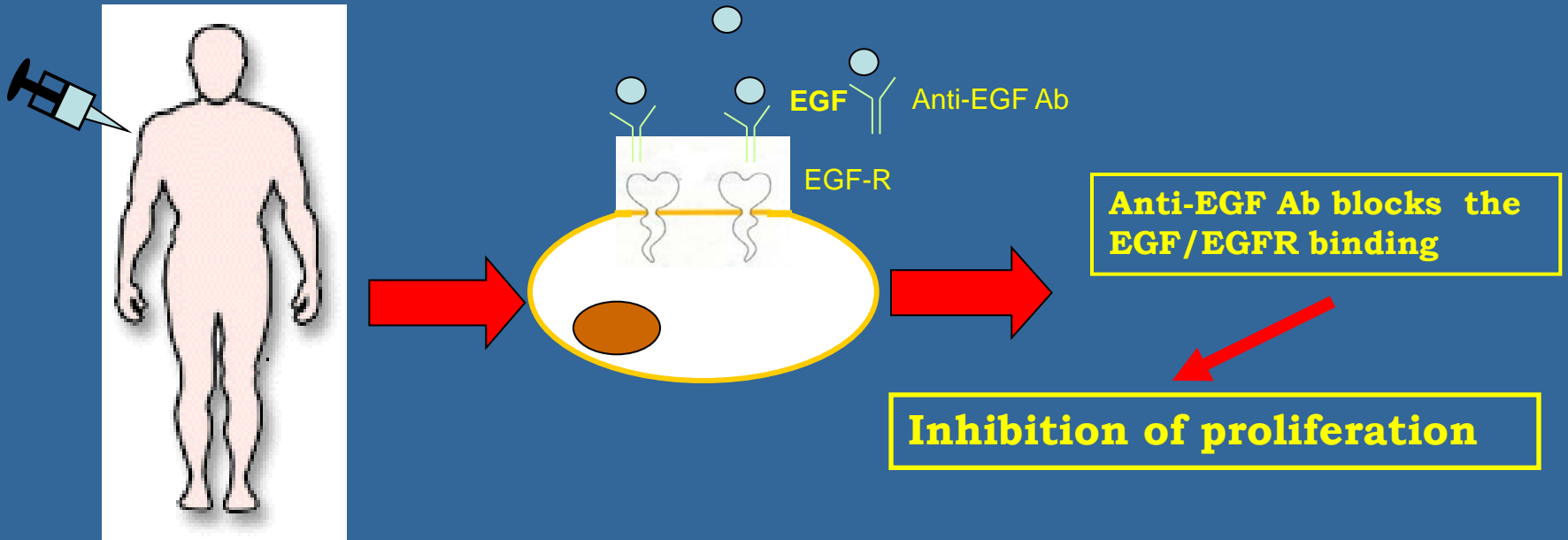
CENPALAB



NSCLC: The EGF-P64 Vaccine

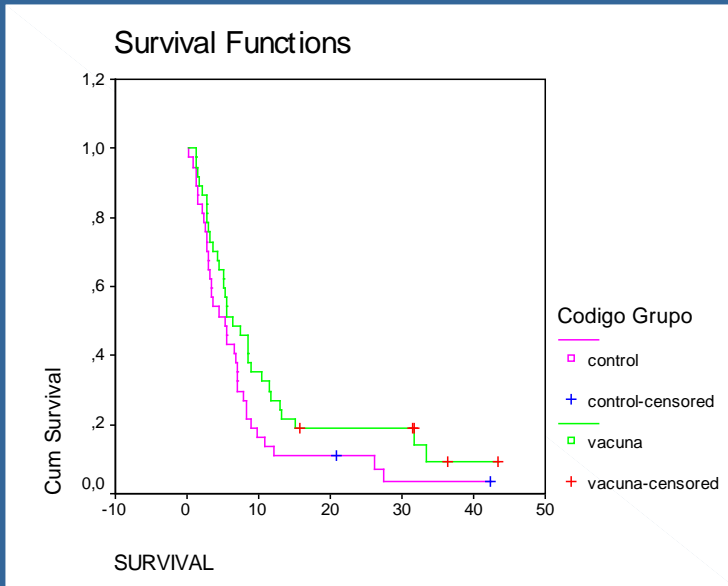


EGF Vaccine



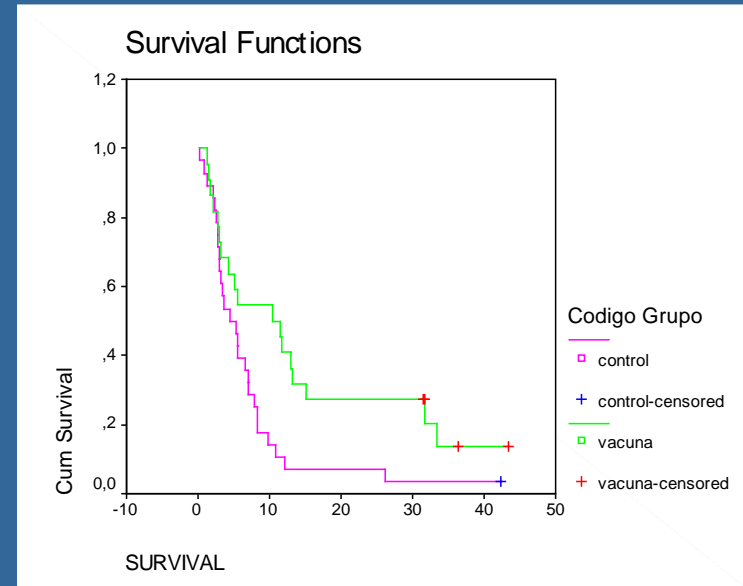
NSCLC: The EGF-P64 Vaccine

Randomized POC Phase II CT in 80 NSCLC patients



ITT (OS)

<i>Group</i>	<i>Median (months)</i>
<i>Vaccine</i>	<i>6,47</i>
<i>Control</i>	<i>5,33</i>



Younger than 60 (OS)

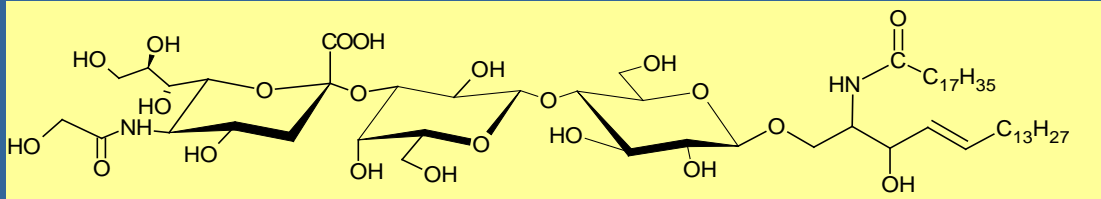
<i>Group</i>	<i>Median (months)</i>
<i>Vaccine</i>	<i>11,47</i>
<i>Control</i>	<i>5,33</i>

Currently ongoing a Phase III pivotal trial in 579 NSCLC patients



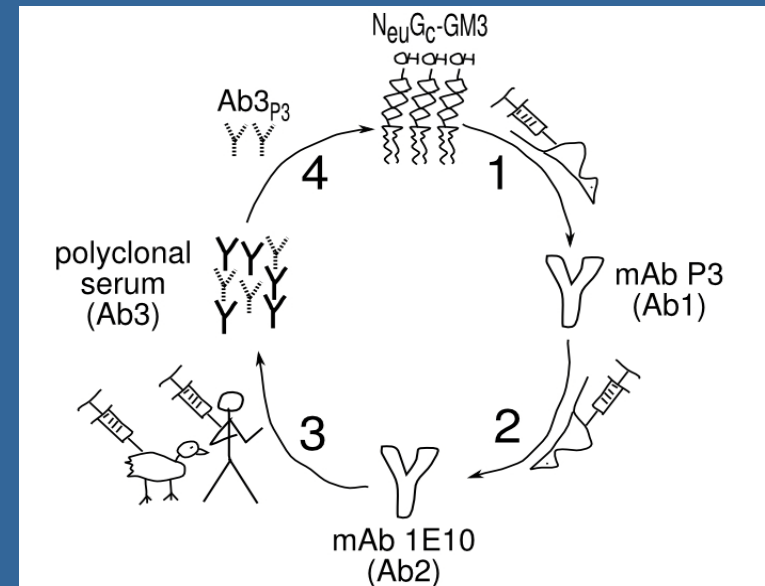
NSCLC: Racotumomab (1E10) Idiotypic Vaccine

An Unique Target: N-Glycolylated Mono Sialyl Lactosyl Ceramide



- Initially reported by us in human breast tumours in the early nineties
- Also expressed in other types of cancers: NSCLC, Colon, Stomach, Ovarian, Melanomas etc
- Almost absent in human normal tissues
- A potent immunosuppressor, mainly for CD4⁺ T cells
- Available from horse erythrocytes and fully synthetic

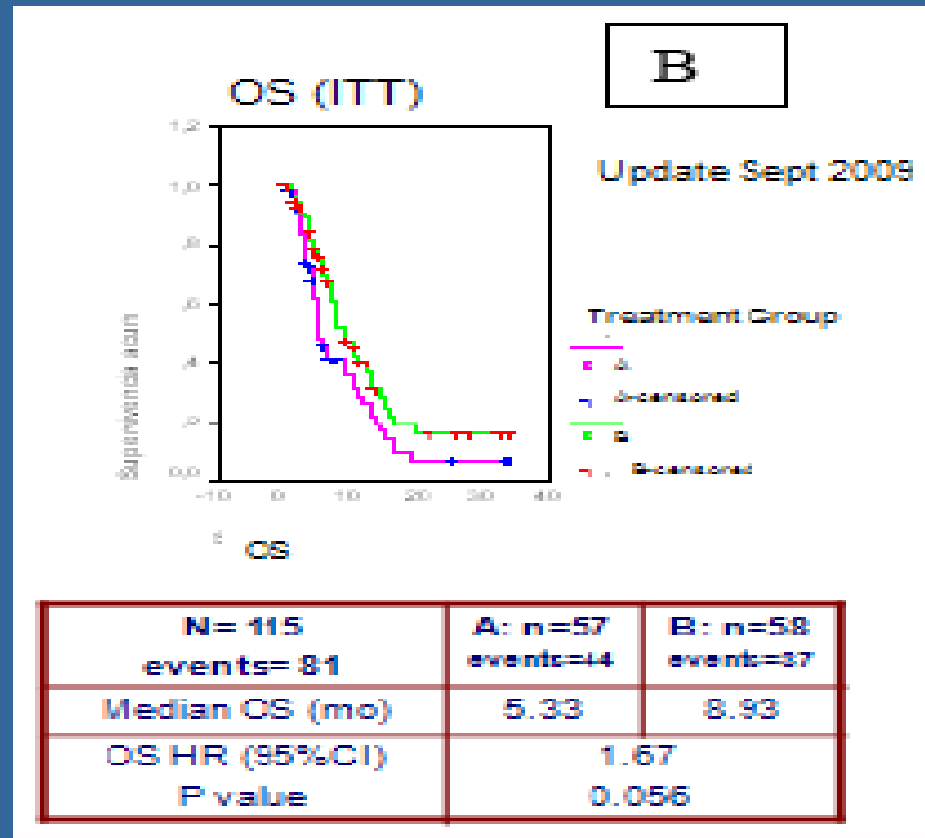
Vaccine formulation: 1E10 mAb in Al(OH)₃



NSCLC: Racotumomab (1E10) Idiotypic Vaccine

Randomized POC Phase II CT in 174 NSCLC patients

Interim analysis at 81 events

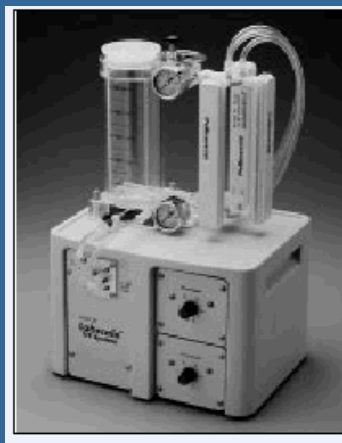
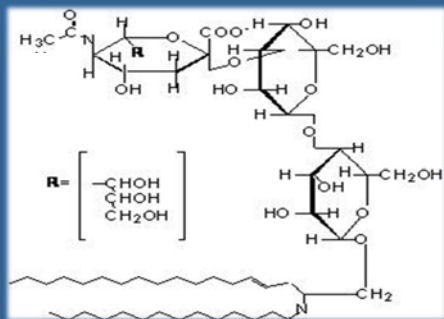


Starting a Multinational Phase III pivotal trial in 1 084 NSCLC patients

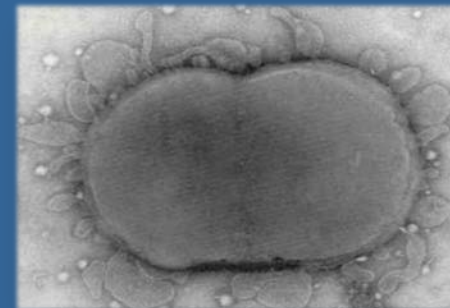


Very Small Sized Proteoliposomes: the Common Fact

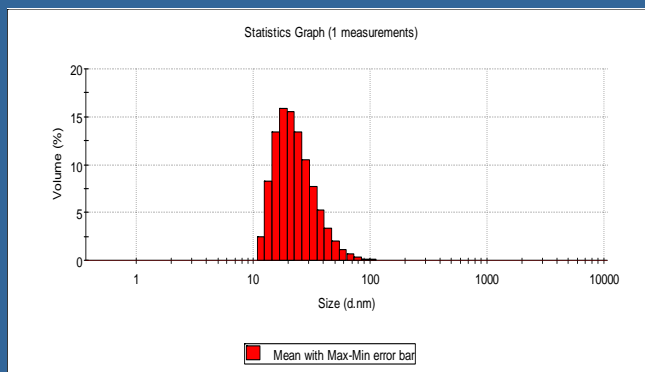
GM3



OMVs *Neisseria meningitidis*



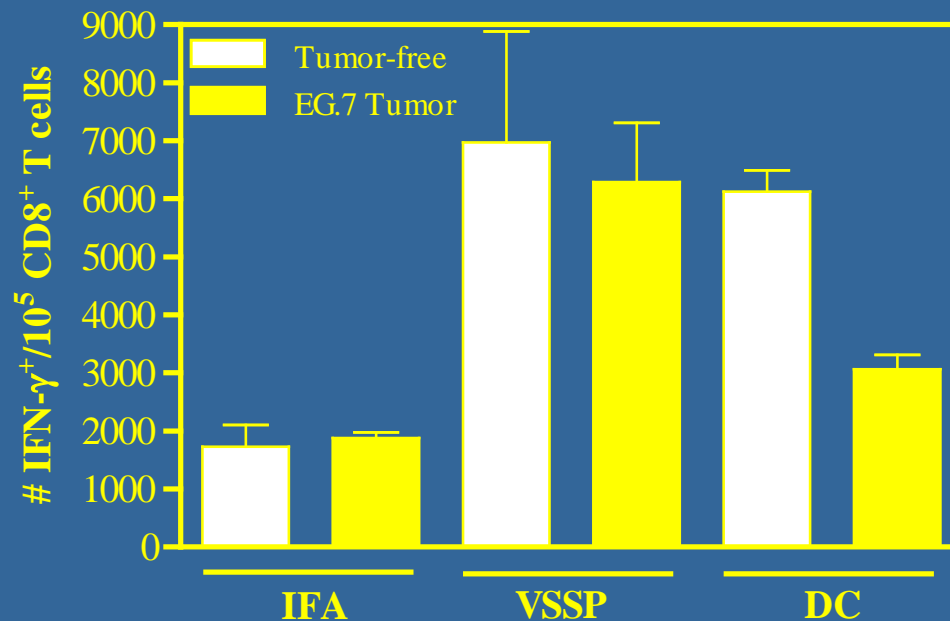
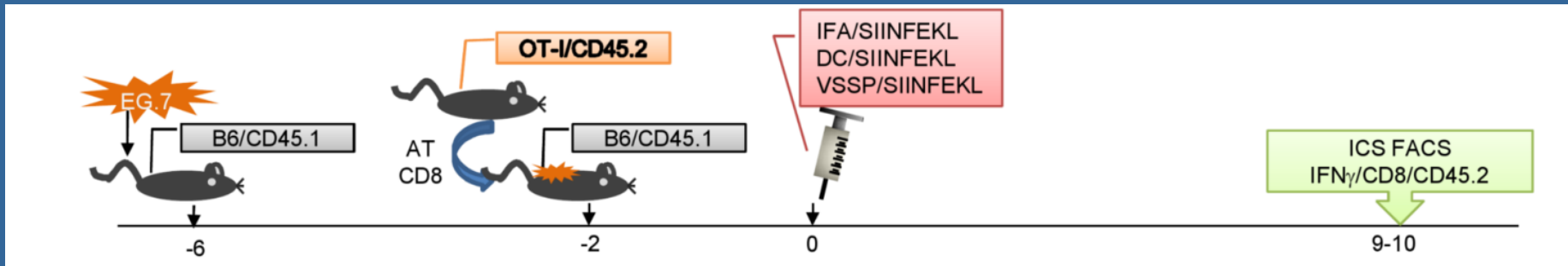
VSSP



Size: $24,7 \pm 1,1$ nm

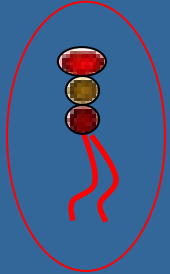
Zeta potential: $- 25.5 \pm 2.54$ mV

Very Small Sized Proteoliposomes: the Common Fact



Breast Cancer: The GlycovaxGM3 Vaccine

NGcGM3



+



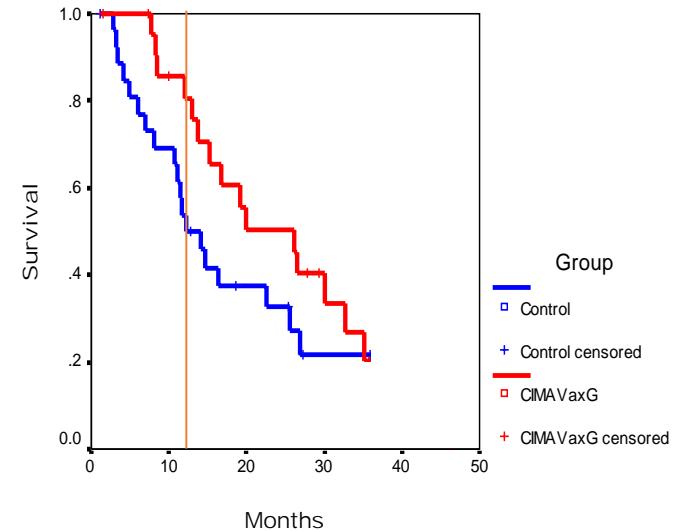
+ Montanide ISA 51

Randomized POC Phase II CT in 79 MBC patients

Survival Analysis for Non Visceral Patients (ITT, n = 50/79)

OS	GlycoVaxGM3 N = 23	Control N = 27	Log Rank (p)	Breslow (p)
Median	26,17	12,17	0,269	0,049

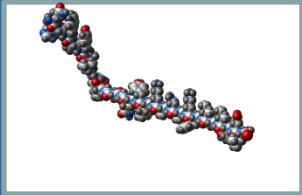
Patients with Non Visceral Metastasis



Currently ongoing two Phase III pivotal trials, one in 776 MBC patients, other in 512 stage IIa, III patients



HeberProvac might be an innovative solution for prostate cancer

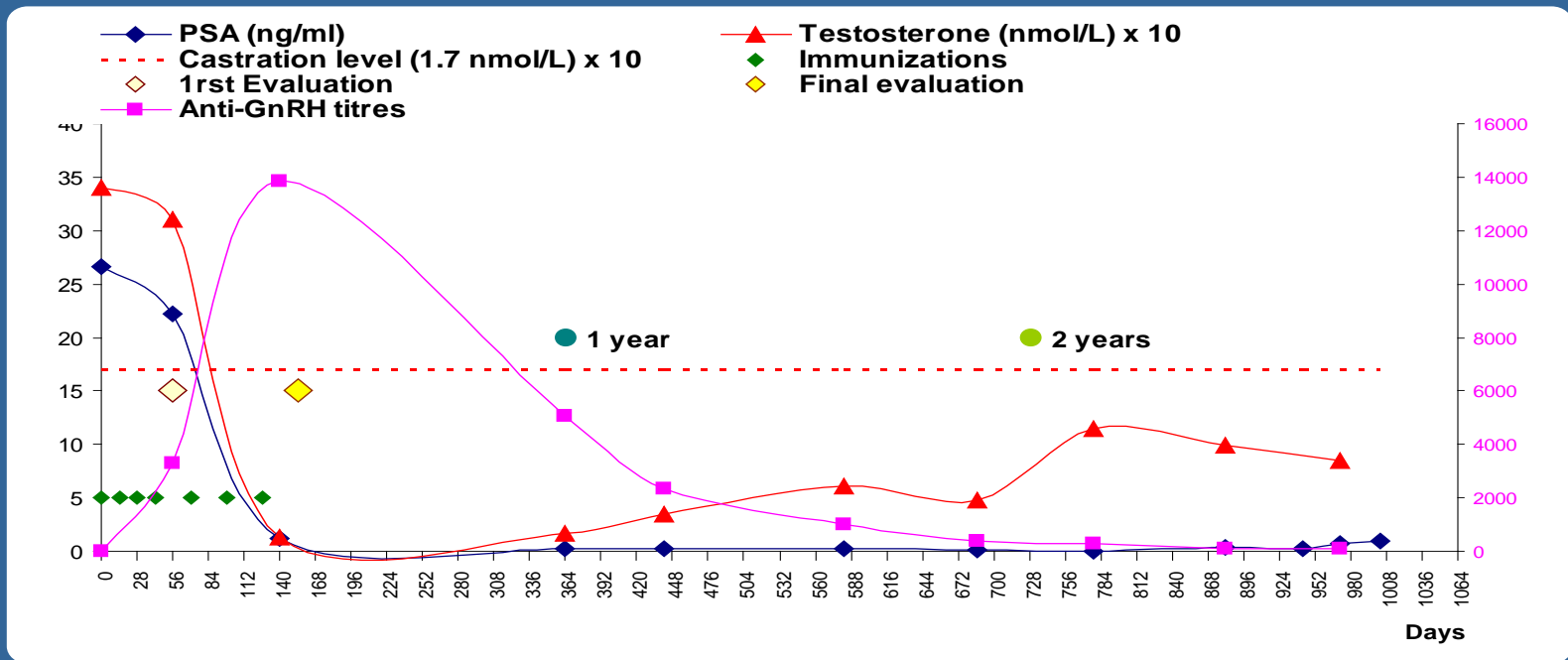


HeberProvac

- Synthetic peptide GnRHm1-TT (3mg)
- VSSP (245 µg)
- Montanide ISA-51 (350 µL)

Phase I Study: 8 hormone-sensitive metastatic prostate cancer patients

Biochemical and Immunological Findings



Clinical Update

- 5 patients with normalized prostate gland
- 1 patient with grade I prostate gland

POC Phase II study starting in 2010



CIGB 228 might be an innovative solution for cervical cancer

CIGB 228: HPV E7 peptide for HLA-A*02 restricción in VSSP, SC injection

Phase I Clinical trial

- ☀ 7 patients with High Grade Cervical Dysplasia / HPV 16/ HLA-A*02 , 4 doses of the vaccine
- ☀ End points: safety, colposcopy and histopathologic analysis, immunogenicity

- The vaccine was safe and well tolerated
- High-grade cervical dysplasias were resolved in 57% of patients
- Partial responses were obtained in 29% of patients
- Complete and partial responses observed in 86% of cases

Patient No	Colposcopy	Histology	Immunogenicity
01	CR	CR	+++
02	SD	SD	++
03	PR	PR	++
04	CR	CR	+++
05	CR	CR	++
06	CR	CR	+++
07	SD	SD	+

POC Phase II study starting in 2010



Concluding Remarks

- **Eight innovative therapeutic cancer vaccines are in development in Cuba as a consequence of the existence of the Cuban Biotech System**
- **Vaccine candidates are focused in the more frequent types of cancer affecting people in Cuba**
- **VSSP vaccine technology is the common fact present in the majority of these projects**



Thanks for your attention!

