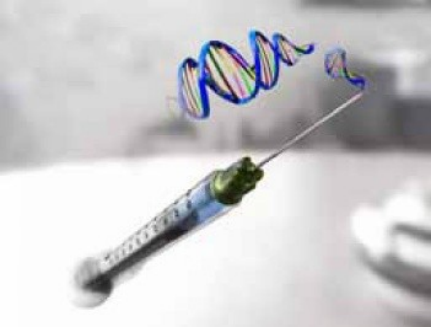


"Le nuove sfide della ricerca oncologica: verso una partnership tra Enti Pubblici e Industria nella regione Lazio"
17 Maggio 2017

I Vaccini genetici contro il Cancro: l'Innovazione che nasce dal Lazio

Luigi Aurisicchio, PhD
Chief Executive and Scientific Officer
Rome, Italy

a Takis Company

Takis Biotech

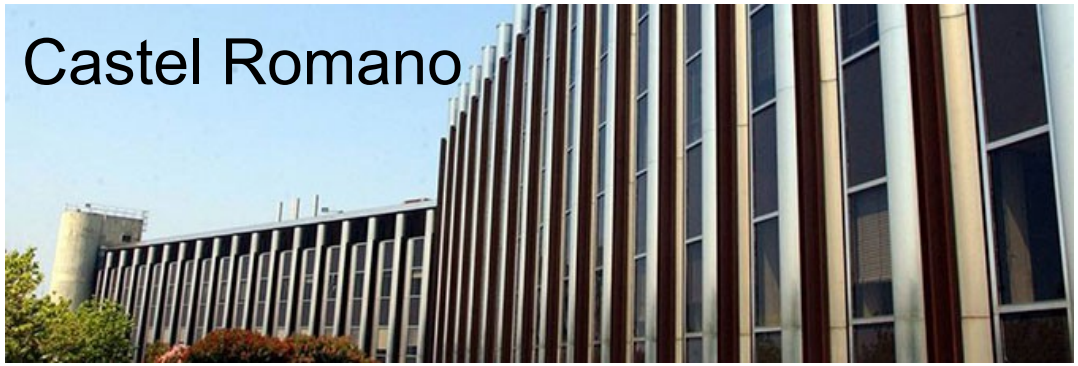
- IRBM spin off , a Merck Inc. subsidiary

Mission

- Oncology **R&D**
- Development of **Cancer Vaccines products**
- Identification of **Novel Targets** and **Biomarkers**
- Provide Services in **Oncology** and **Immunology**

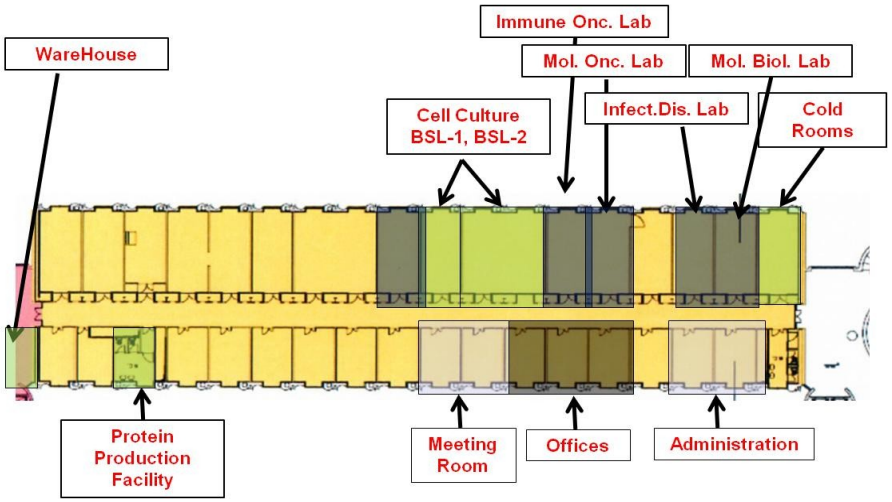
Takis Services

Active since 2010



Specialized in:

- Oncology
- Immunology
- Molecular Biology
- Animal Models



UNI EN ISO 9001:2008
CERTIQUALITY
SISTEMA DI GESTIONE QUALITÀ CERTIFICATO

Takis Vaccine Development Path

- Three Frontline Candidates
- Other programs under Development

	Discovery	Preclinical	Phase I	Phase II

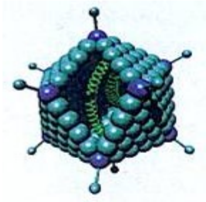
Human Vaccines

- **TK-001, vs Oncogene**
- **TK-002, vs Stromal antigen**
- **TK-003mAb Vs surface rec**

Discovery Programs

Combining Two Technologies

1. Adenovirus



- ✓ Platform technology for vaccines
- ✓ POC immunogenicity in humans

+

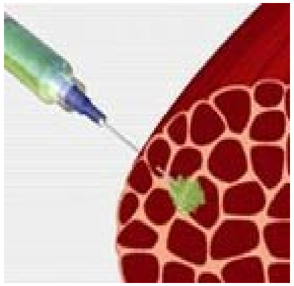
2. Plasmid DNA Delivered Via Muscle Electro-Gene-Transfer (EGT)

- ✓ Optimal technology for boosting: unlimited potential
- ✓ Approved for Clinical Use

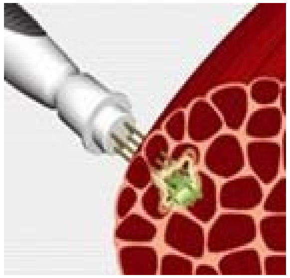
a Takis Company

DNA Electroporation

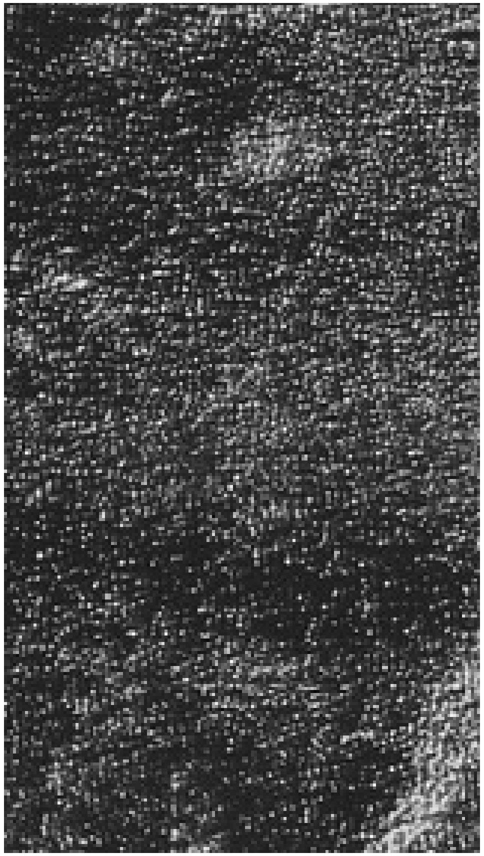
Injection of Vaccine in the deltoid muscle



Electrostimulation

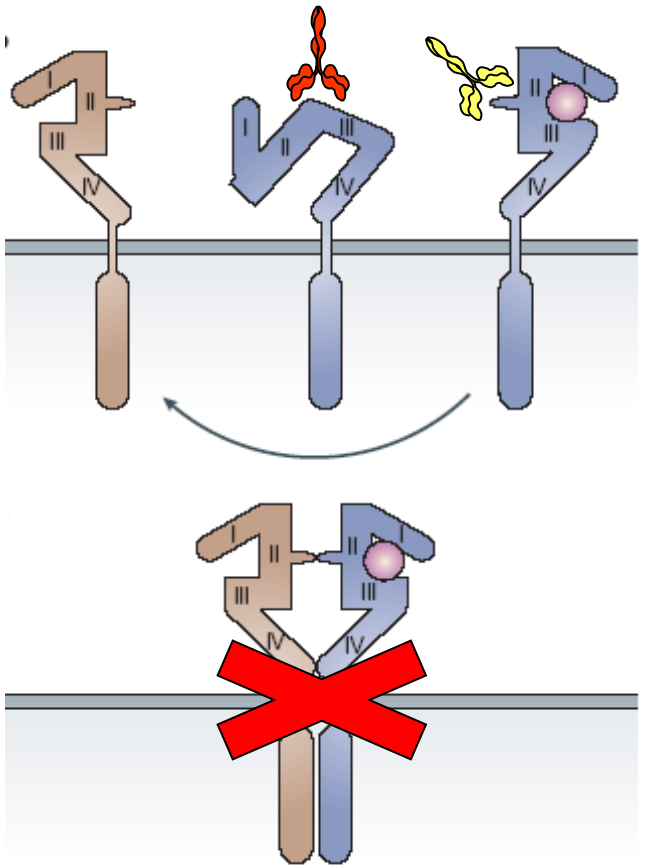


Transient Cell Membrane Permeabilization



RevEr3mAb: (TK003) targets HER3

- **HER3 – Key Role in Resistance**
  - Lung Cancer
  - Melanoma
  - Prostate Cancer
  - Gastric Cancer



Cancer Cell Survival
Proliferation
Metastasis

a Taks Company

Helping Pets, Helping People.
Fighting Cancer with Immune System

One in every four dogs will develop cancer during their lifetime

EvviVax: Focus on Veterinary Cancer Vaccines

- Two Frontline Candidates
- Other programs under Development

Preclinical	Clinical Trial	Regulatory

Veterinary Vaccines

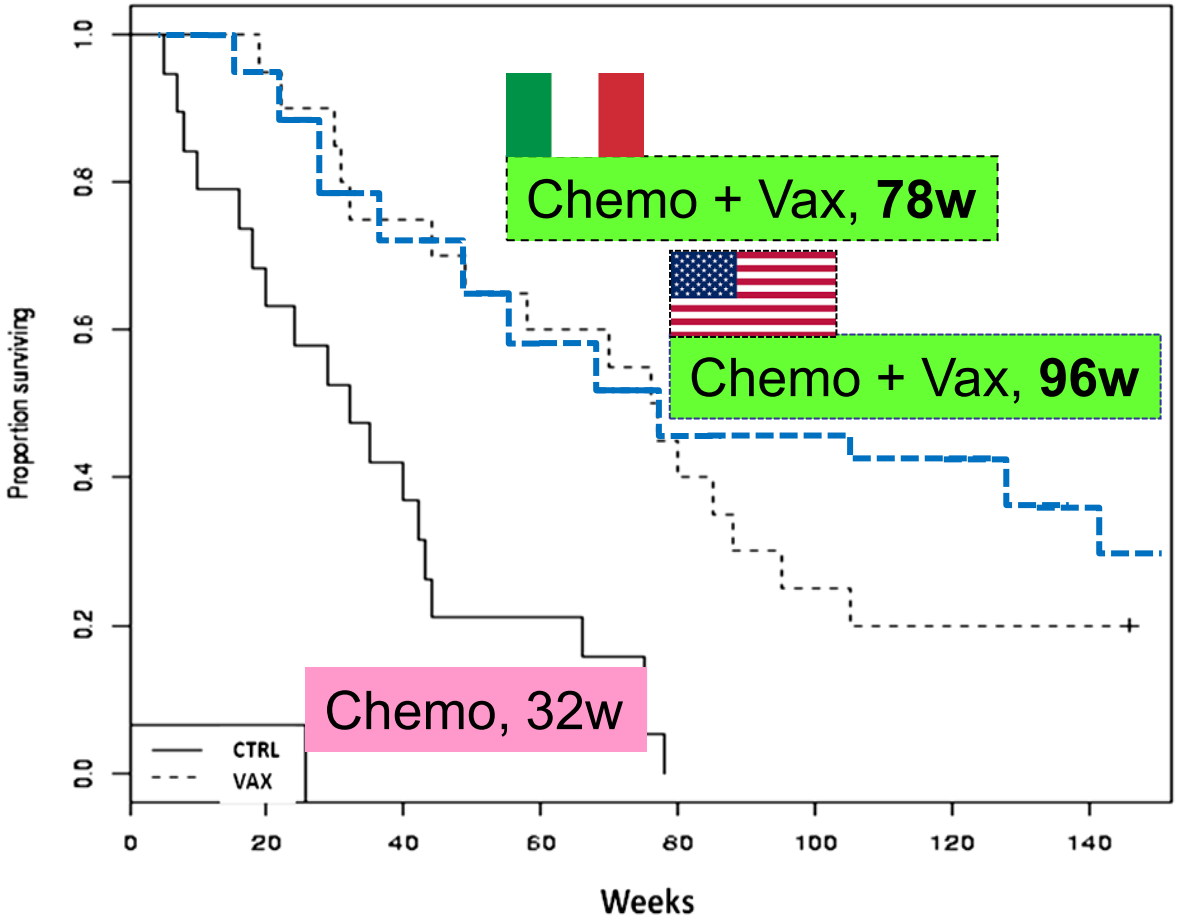
Tel-eVax, vs K9 Telomerase

Erb-eVax, vs K9 HER2/Neu

Discovery Programs

Tel-*e*Vax:
Proof of Concept Achieved!

Overall survival



Gavazza et al., Human Gene Ther 2013

- **>2x Enhanced Dog Survival**
- **Less Chemotherapy Needed**

Other Trials in Progress

- **Solid K9 Cancer**
- **Feline Cancer**

Next Application: Tumor Neoantigens

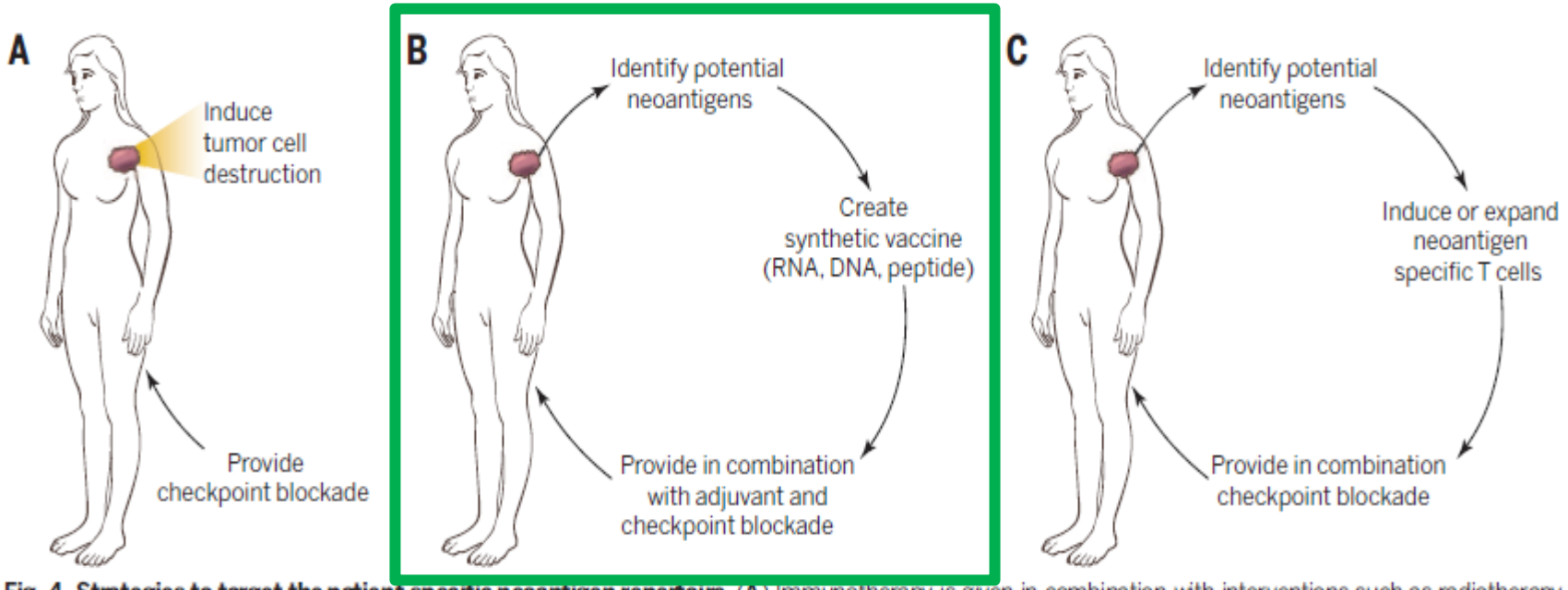


Fig. 4. Strategies to target the patient-specific neoantigen repertoire. (**A**) Immunotherapy is given in combination with interventions such as radiotherapy that enhance exposure to autologous neoantigens. (**B**) Potential neoantigens are identified as in Fig. 1 steps 1 to 3, a patient-specific vaccine is produced, and this vaccine is given together with adjuvant and T cell checkpoint-blocking antibodies. (**C**) Potential neoantigens are identified as in Fig. 1 steps 1 to 3, T cells that are specific for these neoantigens are induced or expanded in vitro, and the resulting T cell product is given together with T cell checkpoint-blocking antibodies.

Neoantigens in cancer immunotherapy

Ton N. Schumacher[1]* and Robert D. Schreiber[2]*

Four weeks Workflow

Tumor sample and Blood Sample

→

NGS:
Exome Seq and RNAseq.
HLA Typing

→

Mutational Map:
In silico identification of MHCI/II Epitopes

↓

Vaccine design:
Cloning into Vaccine Vector

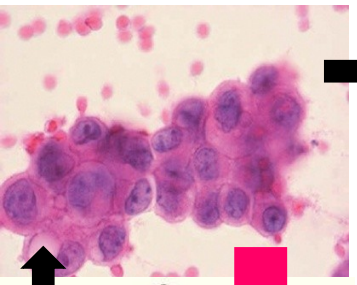
←

GMP Preparation:
Small Scale (50-100mg)

←

Combo with Immune-Checkpoint Inhibitors

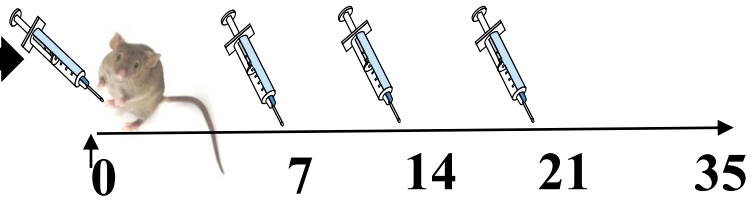
Efficacy Studies in Malignant Pleural Effusion in Takis Immunoavatar



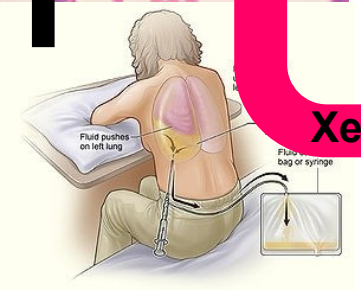
NGS: Exome Seq and RNAseq.

Mutational Map: NARciso

Vaccine Design: pTK6 – 10 epitopes

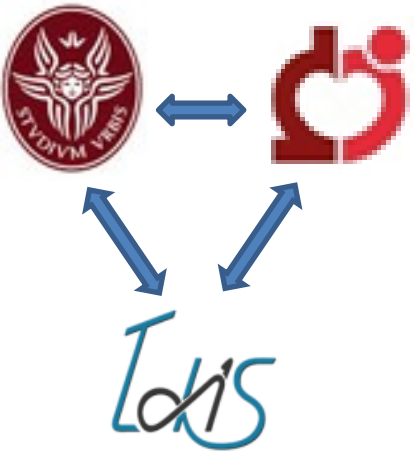


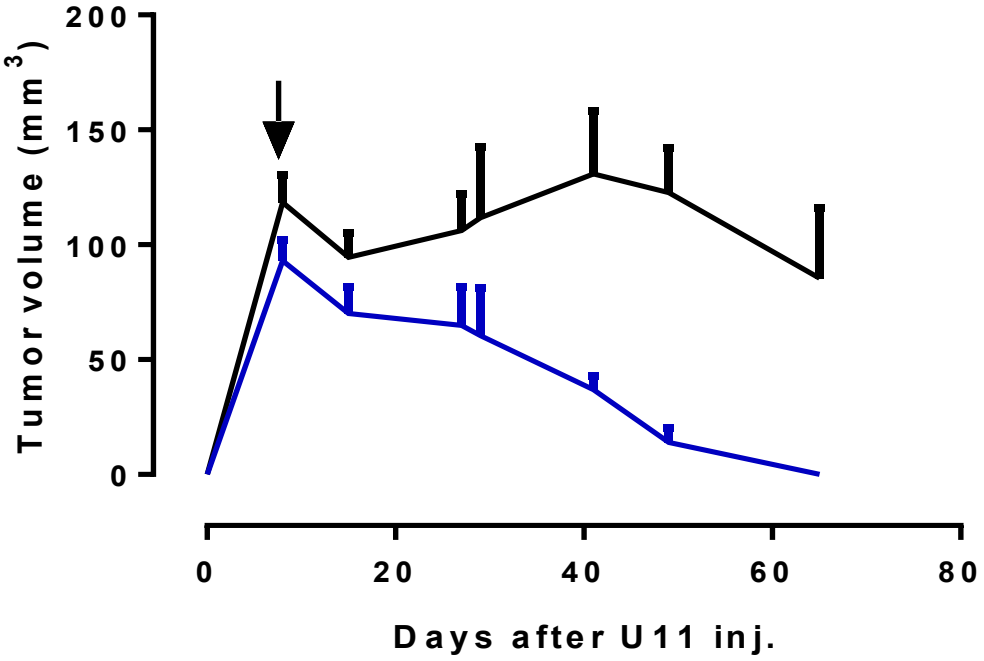
HLA Transgenics: DNA-EGT (pTK6)



Xenograft in Avatar

Transfer splenocytes to Avatar





Partnering is Key to Success….

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Our Current Collaborators

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UNIVERSITÀ DI ROMA

IRE
ISTITUTO NAZIONALE TUMORI
REGINA ELENA

ISG
ISTITUTO DERMATOLOGICO
SAN GALLICANO

ISTITUTI DI RICOVERO E CURA A CARATTERE SCIENTIFICO

Magna Graecia
University of Catanzaro

UNIVERSITÀ
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DI TORINO
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TAURINENSIS

biogem

Università di Napoli Federico II

Our Needs from Academia in Lazio

- Source of **Patient Samples** (Biopsy, serum, PBMCs), **Bioinformatics** and **Clinical Expertise**

- **GMP expertise** and **Assay Development**

- **Networking** and **Partnerships**

C.H.I.CO. Innovative Lazio
Cluster of Health Innovation and Community

REGIONE LAZIO

- Un’Area dalle enormi potenzialità nell’ambito dell’**Immuno-Oncologia**
  - Ricerca Traslazionale
  - Sviluppo di Prodotti Innovativi
  - Networking
- Potenziale **Centro di Eccellenza** Italiano delle Biotecnologie e di riferimento Europeo

LAZIO INNOVA

Luigi Aurisicchio
Founder, Chief Executive
and Scientific Officer

e.mail: aurisicchio@evvivax.com
aurisicchio@takisbiotech.it
Web: www.evvivax.com & www.takisbiotech.it

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