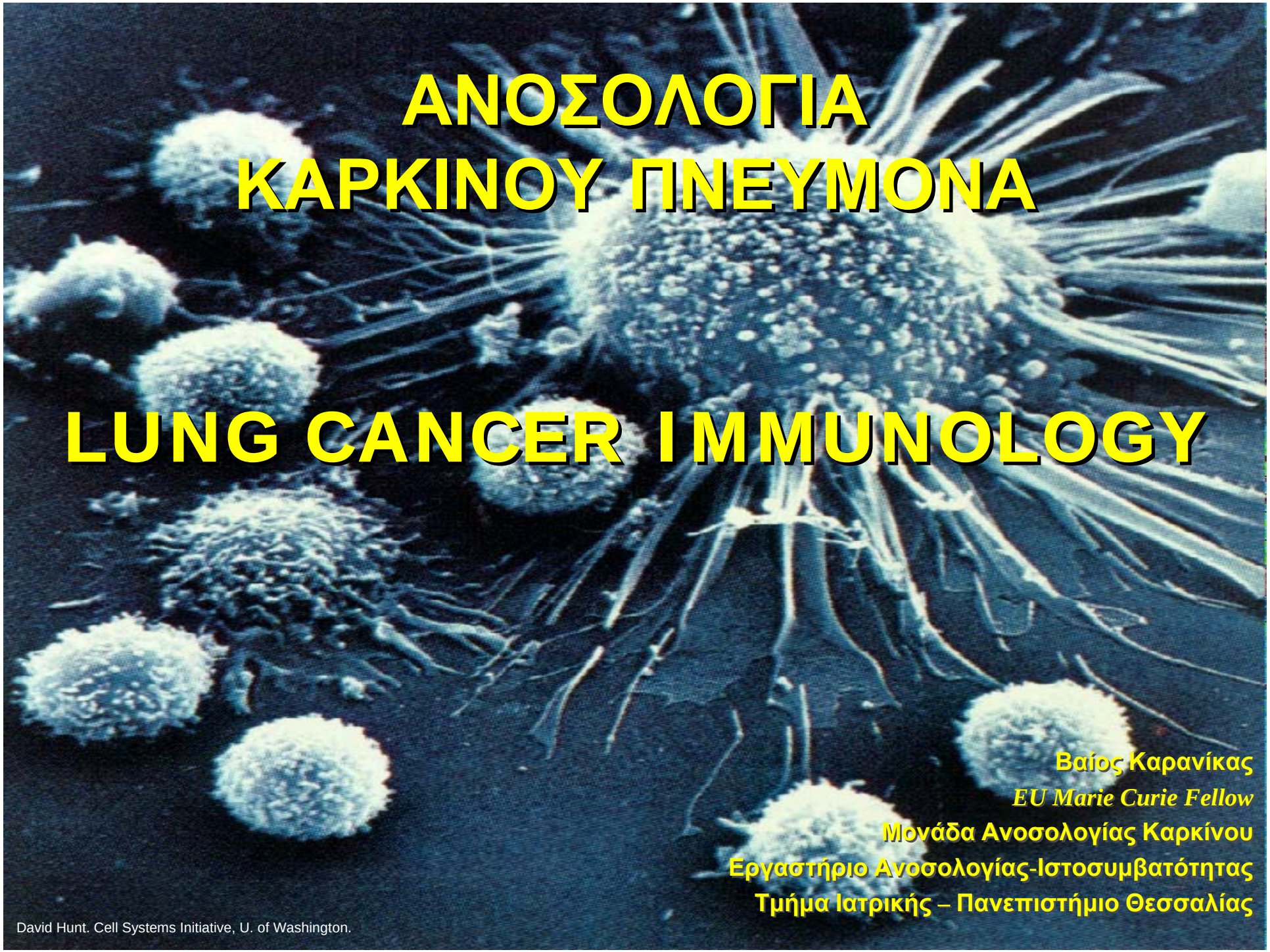


# ΑΝΟΣΟΛΟΓΙΑ ΚΑΡΚΙΝΟΥ ΠΝΕΥΜΟΝΑ

# LUNG CANCER IMMUNOLOGY


**Βαΐος Καρανίκας**

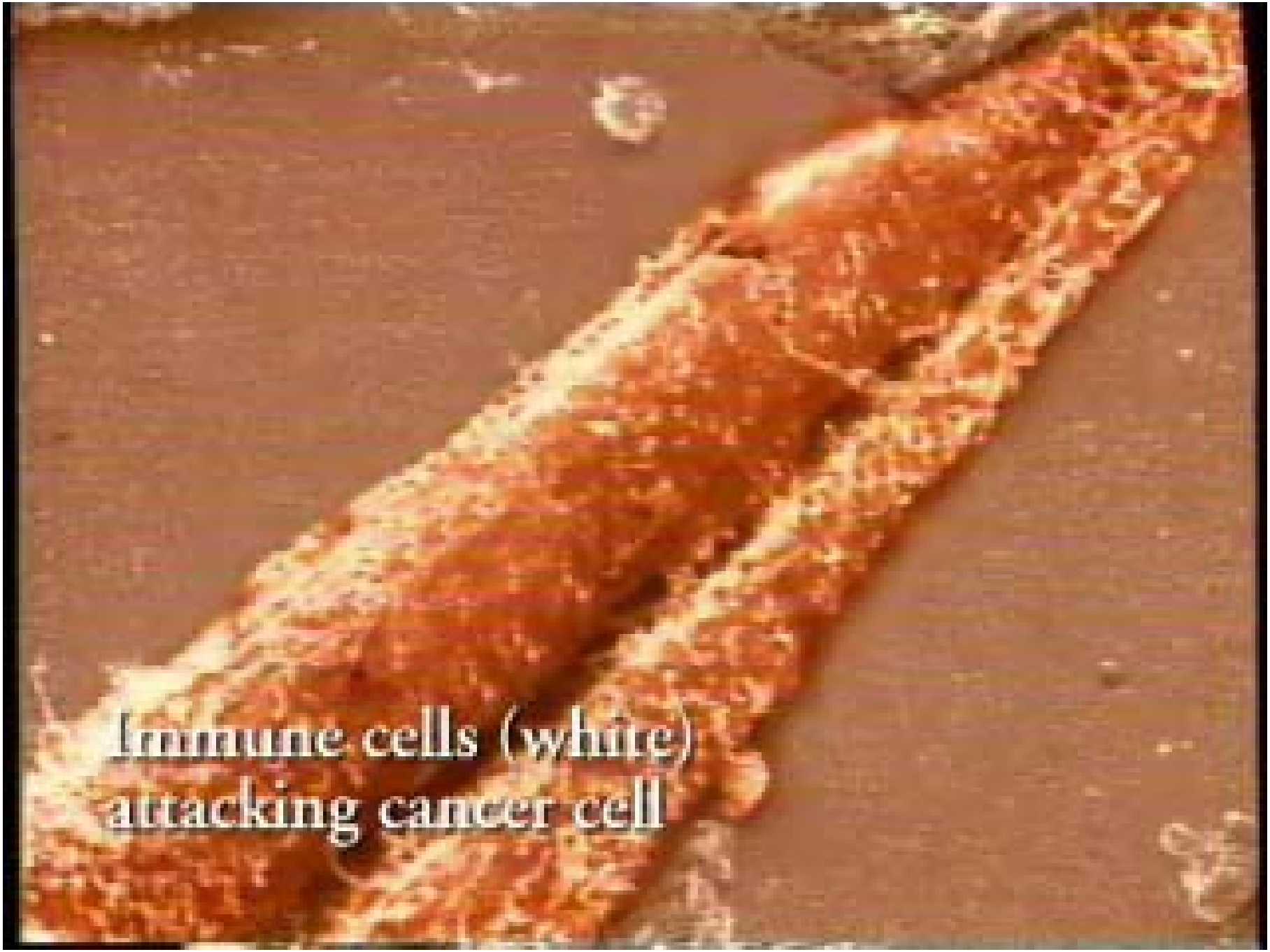
***EU Marie Curie Fellow***

**Μονάδα Ανοσολογίας Καρκίνου**

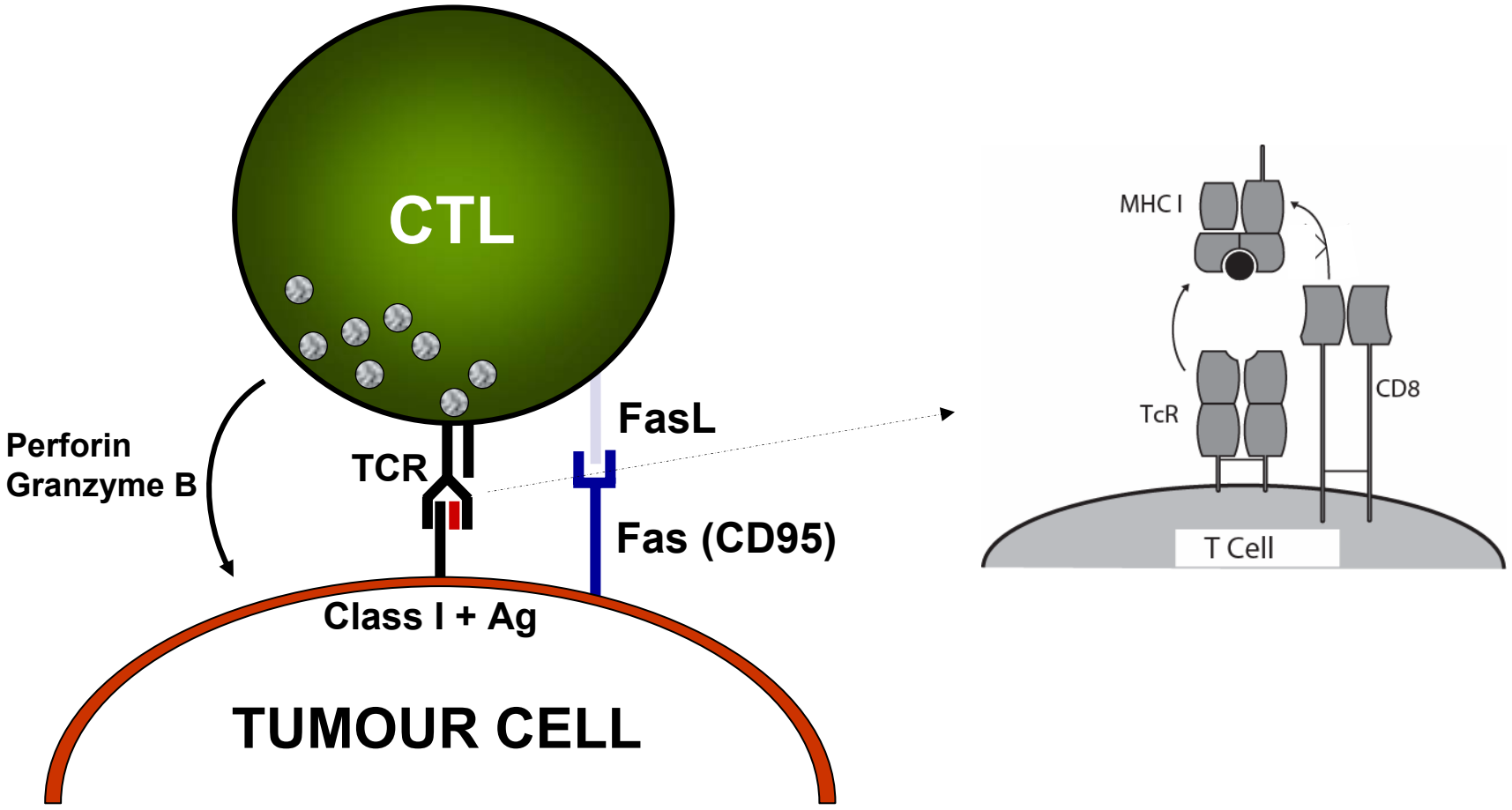
**Εργαστήριο Ανοσολογίας-Ιστοσυμβατότητας**

**Τμήμα Ιατρικής – Πανεπιστήμιο Θεσσαλίας**

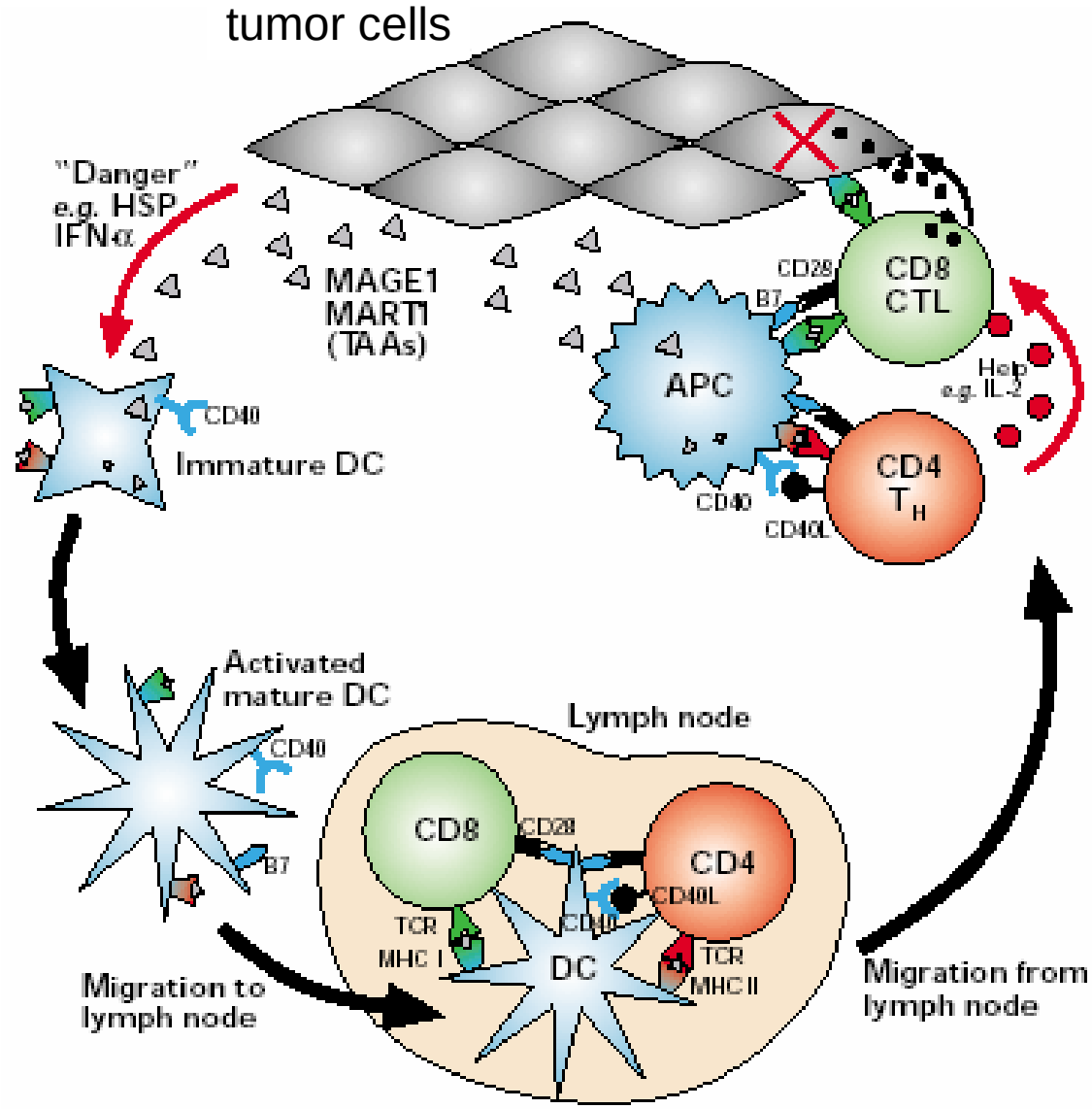

David Hunt. Cell Systems Initiative, U. of Washington.


Immune cells (white)
attacking cancer cell

# T cell activation and tumour lysis



# T cell activation and tumour lysis



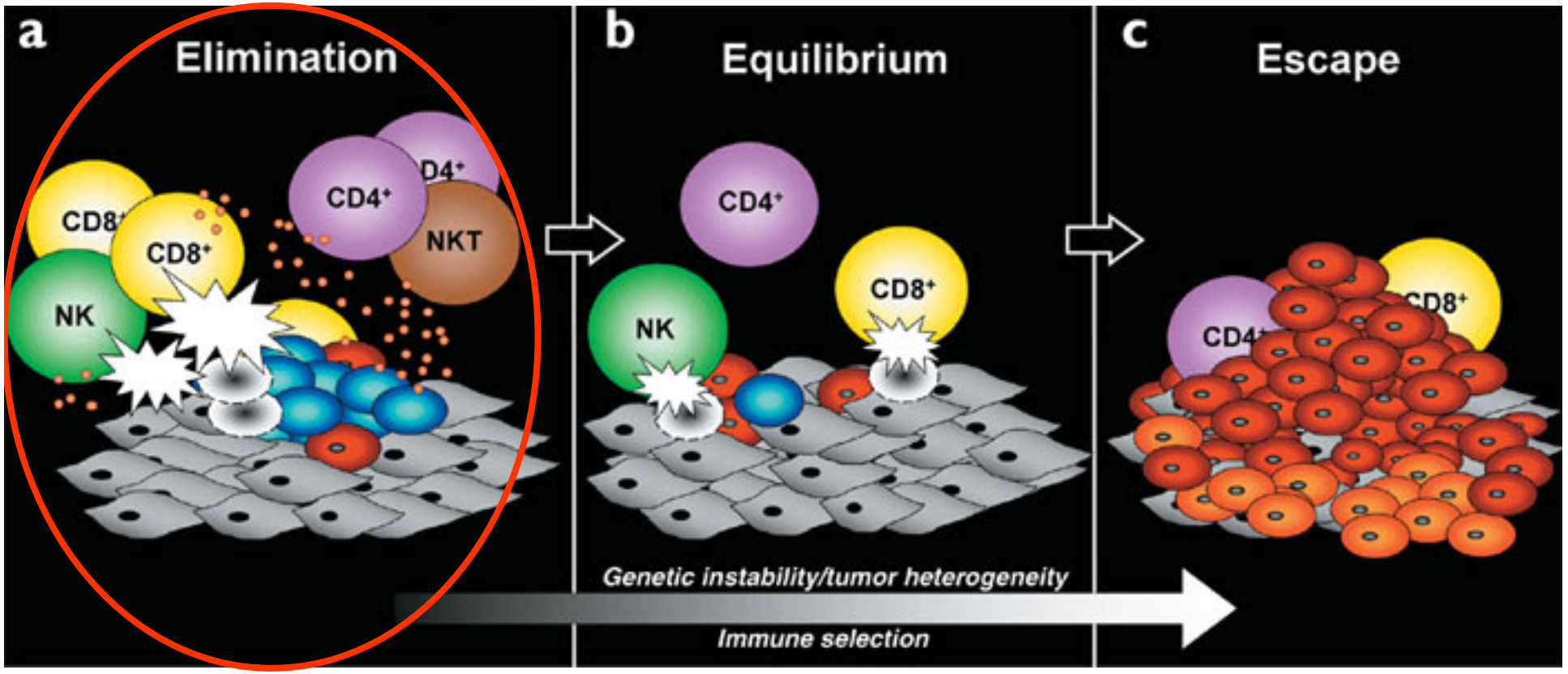

**Steps for effective anti-tumour CD8+ T-cell response:**

| |
|---|
| Tumour Ag presentation by antigen-presenting cells (APCs) in the draining LN |
| specific T cells must respond by proliferation |
| circulating T cells must enter the tumour |
| T cells must overcome local immune-suppressive molecules to recognize and kill targets |
| memory cells are generated |
| **Tumour recognition and lysis can fail at any of these steps** |

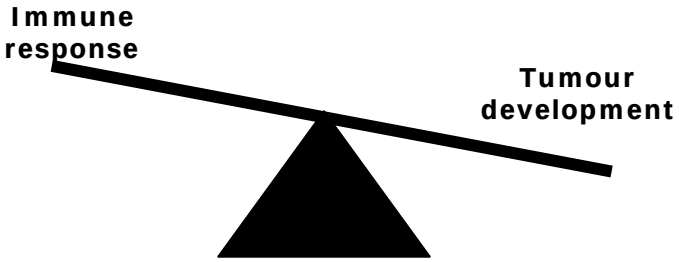
Nat Immunol. 2001 2:293

# The Immunosurveillance theory

## The Three E's

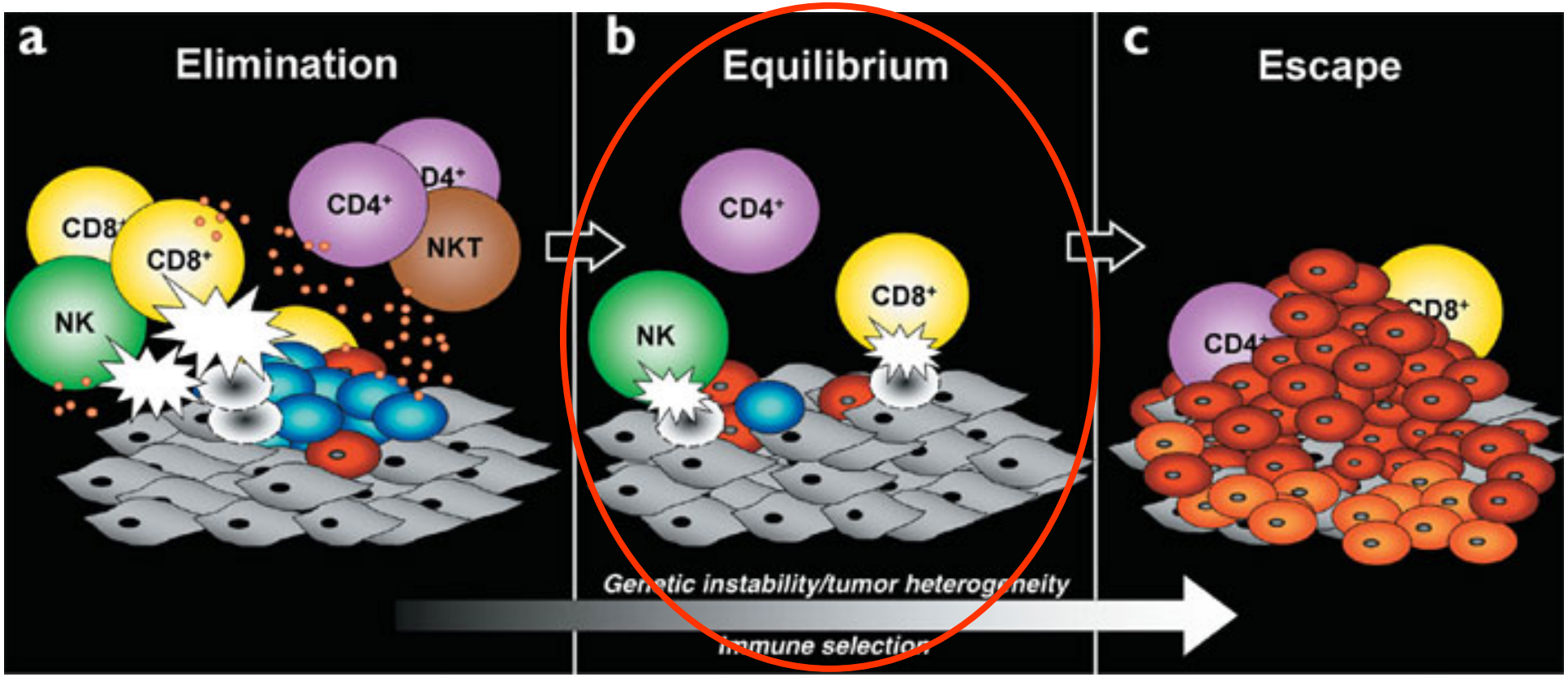



Dunn, Old, Shroeber et al; Nature Immunology 2002

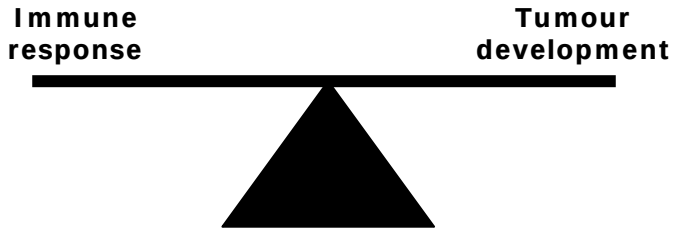


# The Immunosurveillance theory

## The Three E's

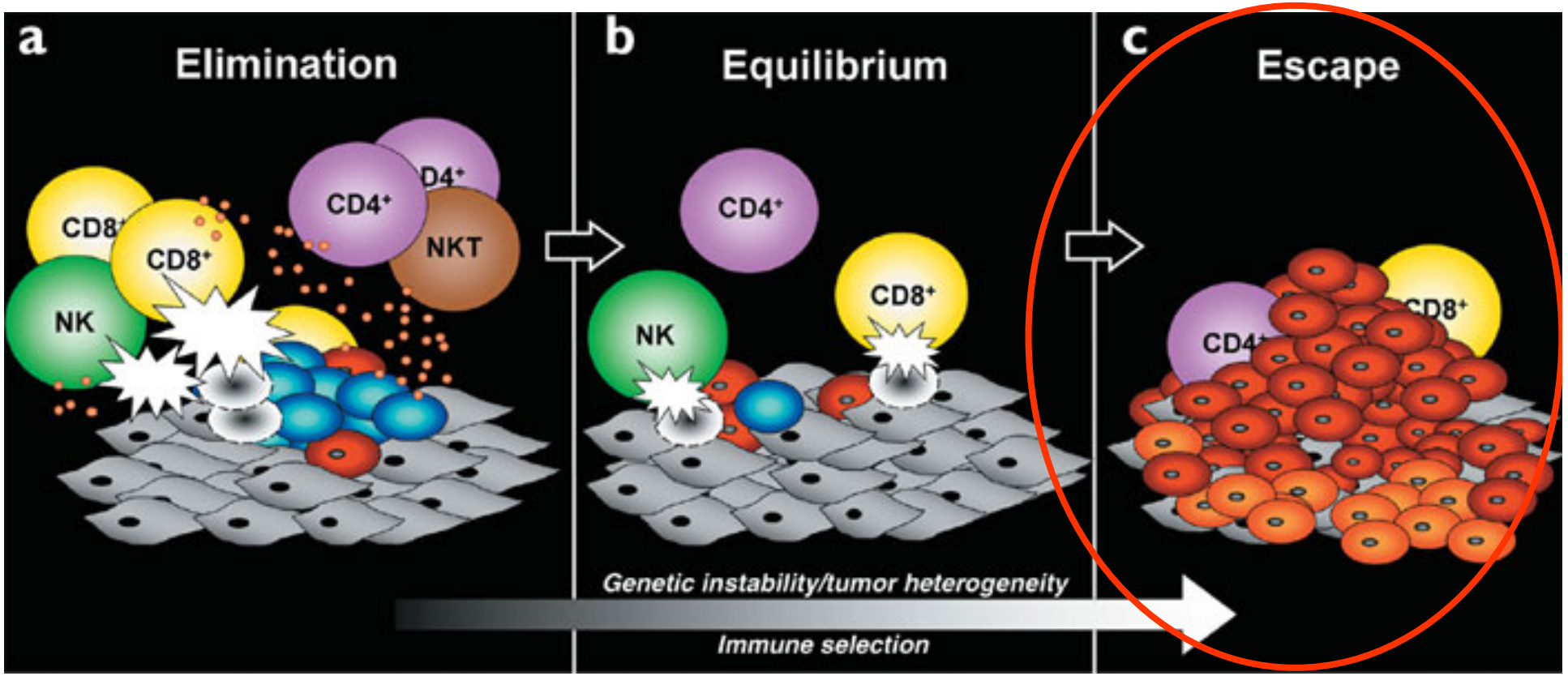



Dunn, Old, Shroeber et al; Nature Immunology 2002

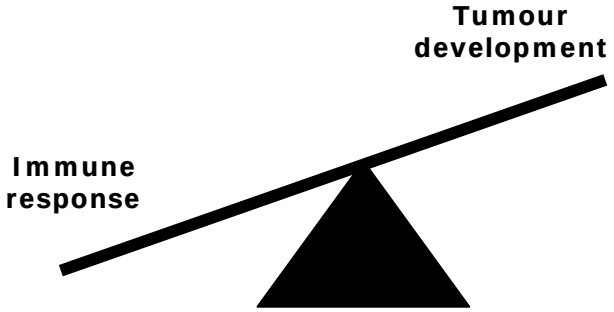


# The Immunosurveillance theory

## The Three E's




Dunn, Old, Shroeber et al; Nature Immunology 2002



# Therapeutic Vaccines - Problems

**No strong clinical response**

*(~**3 %** of vaccinated patients regress for short term)*

**Lack of detection of spontaneous & vaccine induced immune responses**

*(-understanding TAA expression and immune profile)*

*(-access, resistance to lysis, suppressive factors, tolerance….)*

# IRTALUNG

Evaluation of **I**mmune **R**esponses Against
Highly Expressed **T**umor **A**ntigens in
Non-Small Cell **Lung** Cancer;
Prospects for Immunotherapy

# IRTALUNG Concept / Hypothesis

**If lung tumors**
**express a plethora of TAA antigens**

↓

**then it would be expected that**

↓

**effective anti-tumour CTL immunity**
**should be directed against**

↓

**multiple epitopes from these antigens**

# Lung cancer Tumour Immunology

T cells are present in
tumour infiltrates

No Lung Cancer specific
antigen identified

T cells against
mutated Ag, hTERT, CEA etc

# IRTALUNG Objective / Aim

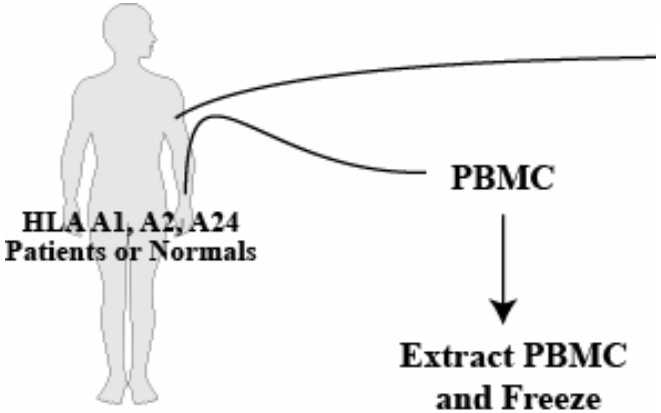
**To explore the expression profile of TAA in patients with lung cancer**

**AND**

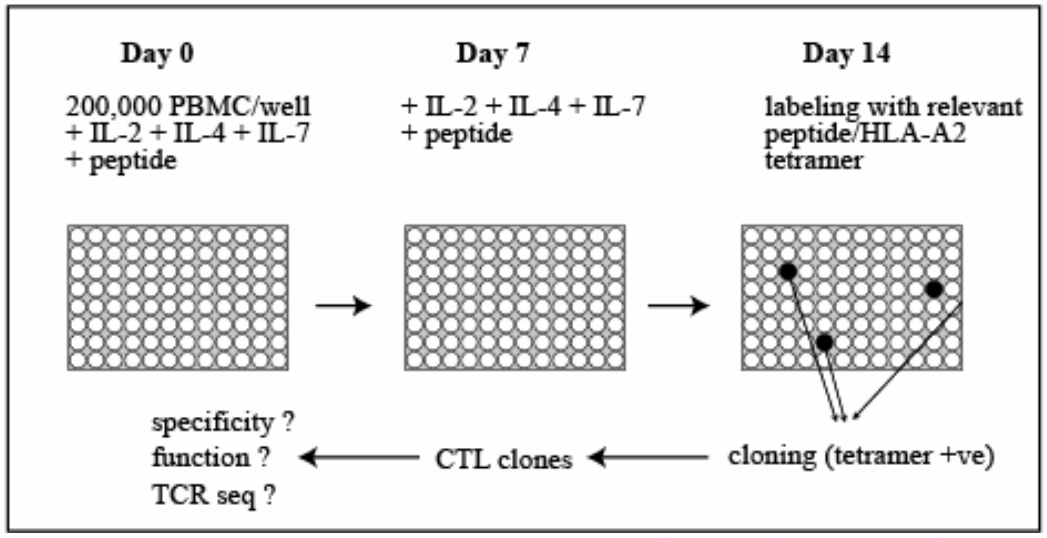
**to determine the strength and the quality of the immune response against them**

# IRTALUNG Experimental design

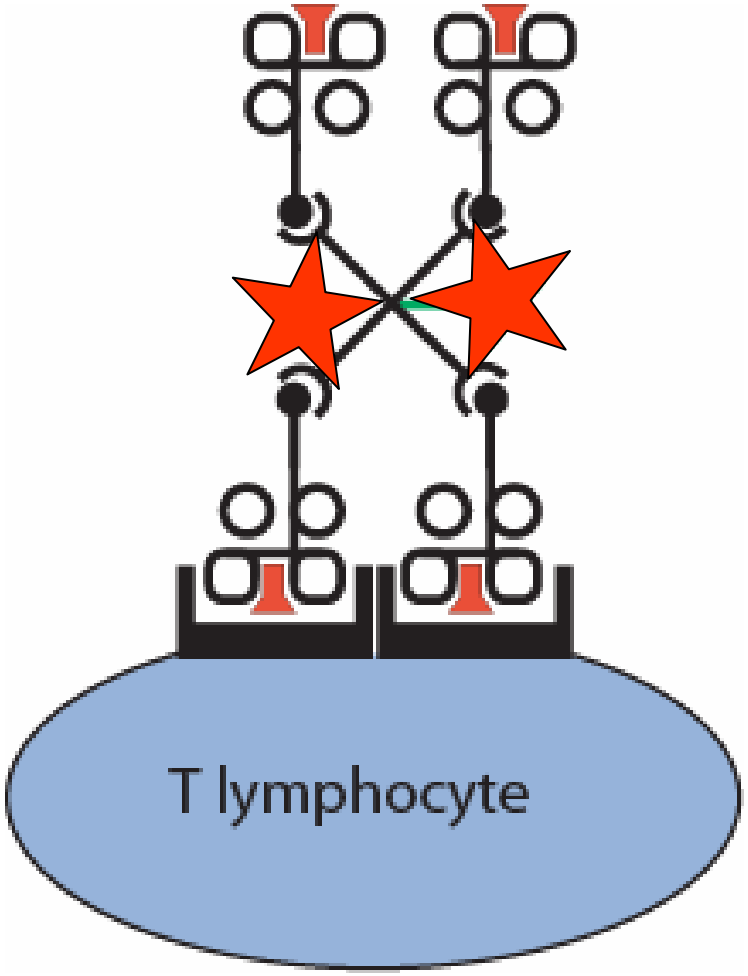
## Part 1: Cellular Immune response analysis




**Stimulation of PBMC with Peptides**

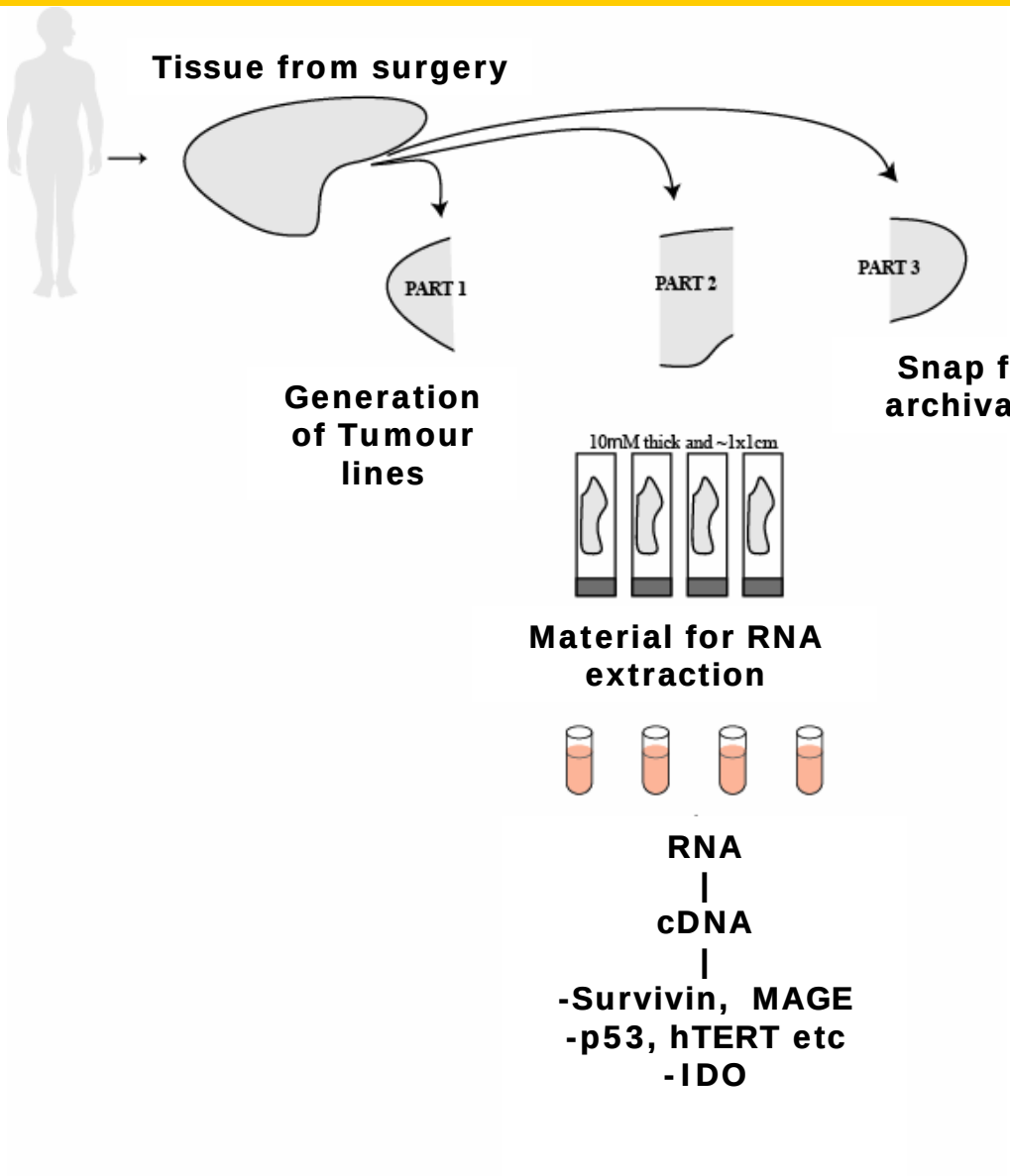



Karanikas et al; J Immunol 2003



# IRTALUNG Experimental design

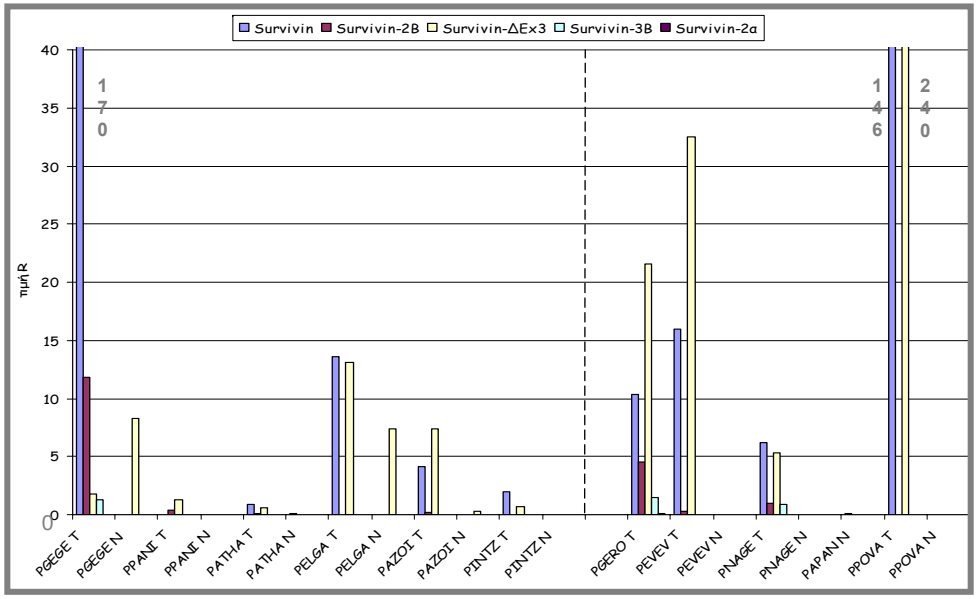
## Part 2:- Tumour Antigen expression analysis
## - Immunoregulatory molecule analysis



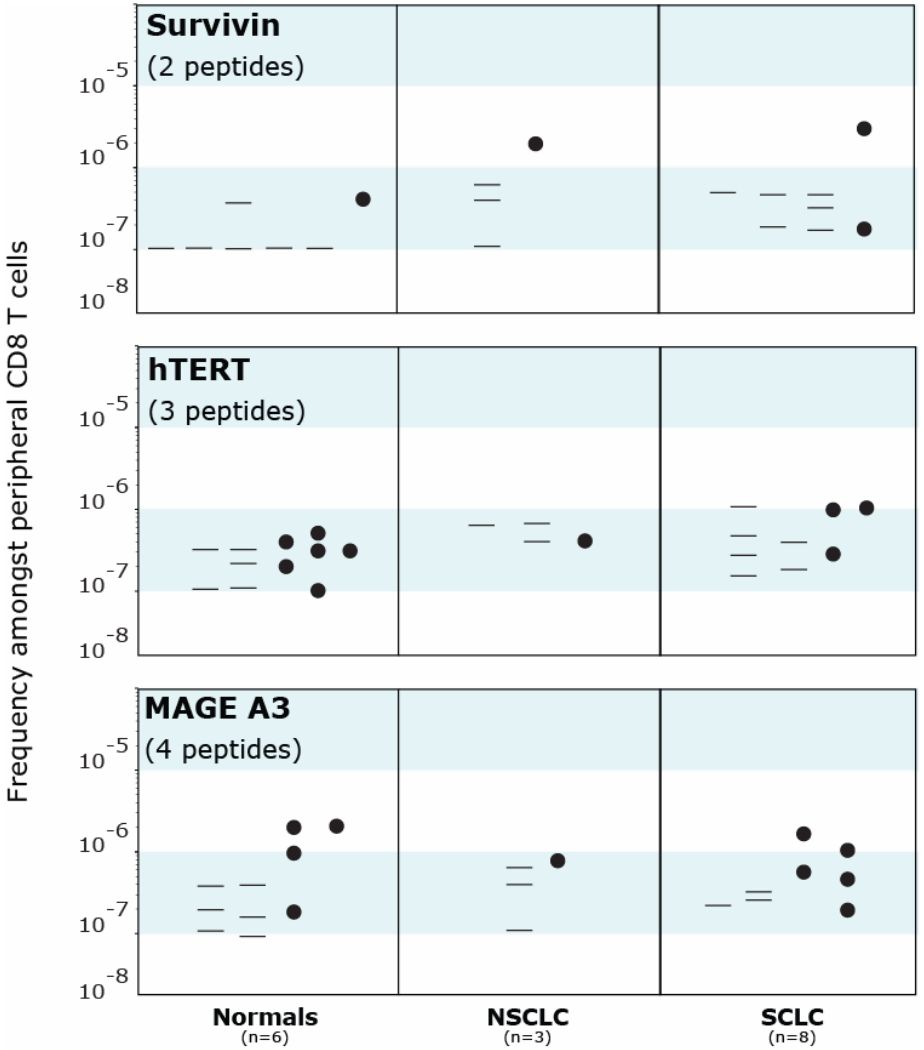
# IRTALUNG

# IRTALUNG Results

## Antigen expression




## T cell response



# IRTALUNG Outcomes/Perspectives

- TAA expression profile (real time PCR, Ag)
- CTL responses in normal individuals and patients with cancer (central & peripheral tolerance?)
- CTL response against multipe epitopes of self antigens (role?)
- Functional characteristics of CTL

# IRTALUNG-→ Cancer IMMUNOEPIGENETICS

**Cancer is a systemic disease that can possibly affect the immune system and the mechanisms involved in the anti-tumour response**

# Department of Immunology and Histocombatibility

## Prof Anastasios Germenis

# Cancer Immunology Unit

## Dr Vaios Karanikas

**Kalala F**
**Tsohas S**
**Loules G**
**Argentou N**
**Vardakastani N**
**Gramoustianou E**
**Zamanakou M**
**Khalil S**
**Siska E**
**Soukou F**
**Boukas K**

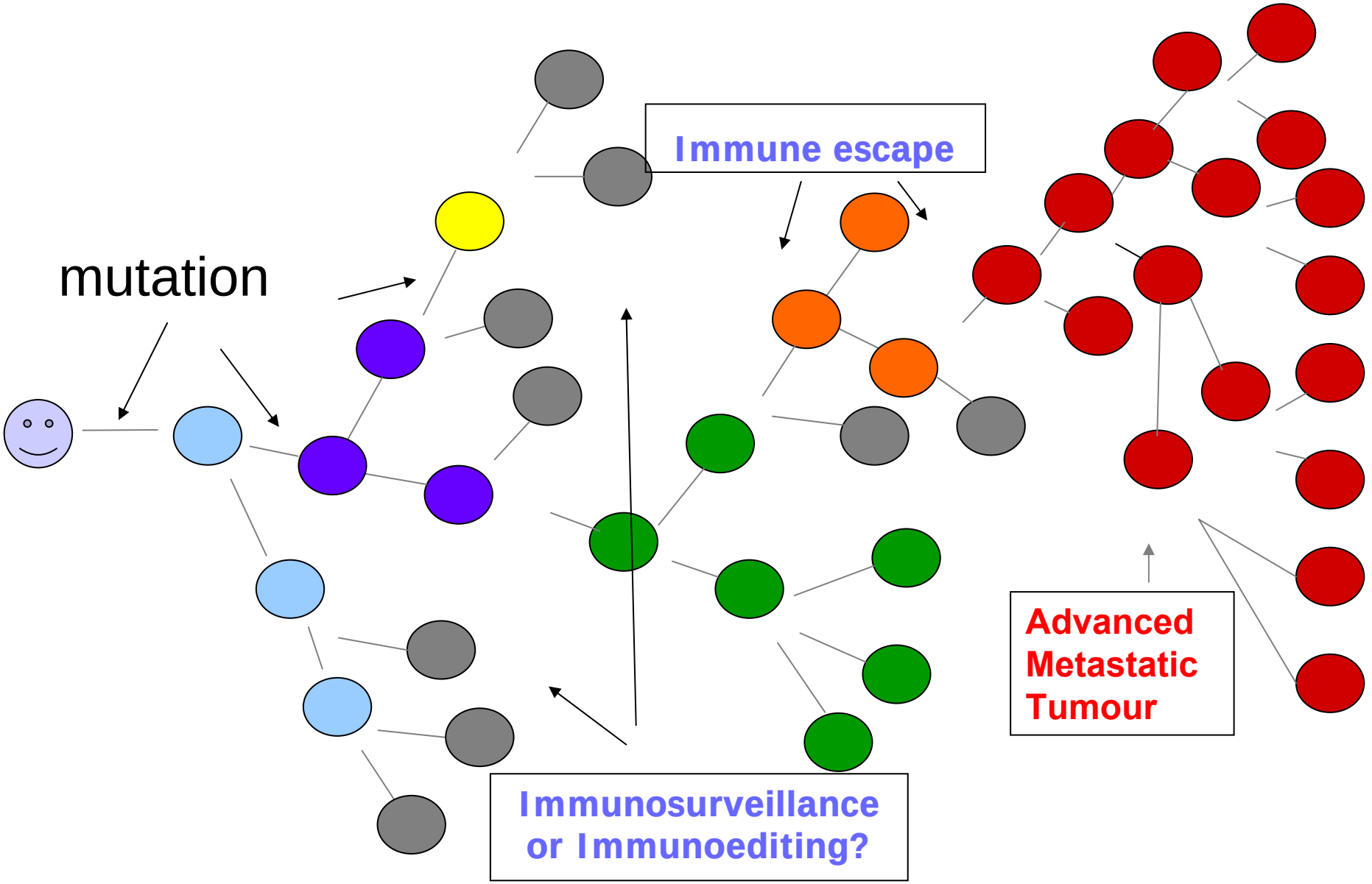
# Collaborators

- **Respiratory Medicine Department, UTH:** Prof Gourgoulianis K, Kerenidi N
- **Thoracic Surgery Department, UTH:** Dr Hevas A
- **Department of Pathology, UTH:** Prof Koukoulis G, Nakou M
- **Genetic and Cellular Unit, Ludwig Institute for Cancer Research, Belgium:** Prof Coulie
- **Cancer Trials Laboratory, Austin Research Institute, Melbourne, Australia:** Prof. Loveland
- **2nd Department of Surgery, University of Kitakyushu, Japan:** M. Takenoyama

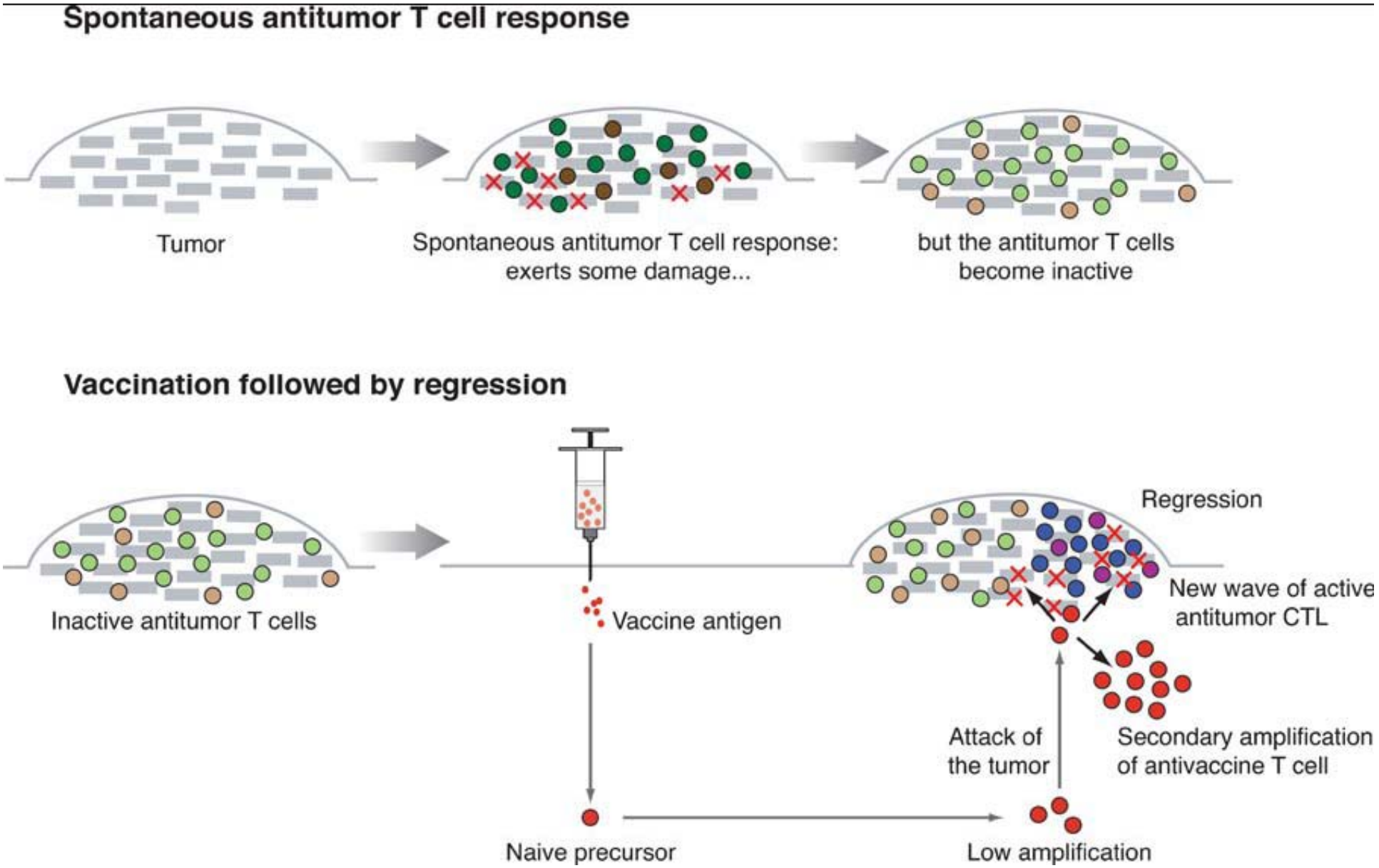
# Funding

**EU, GSRT, GSK, Pfizer**

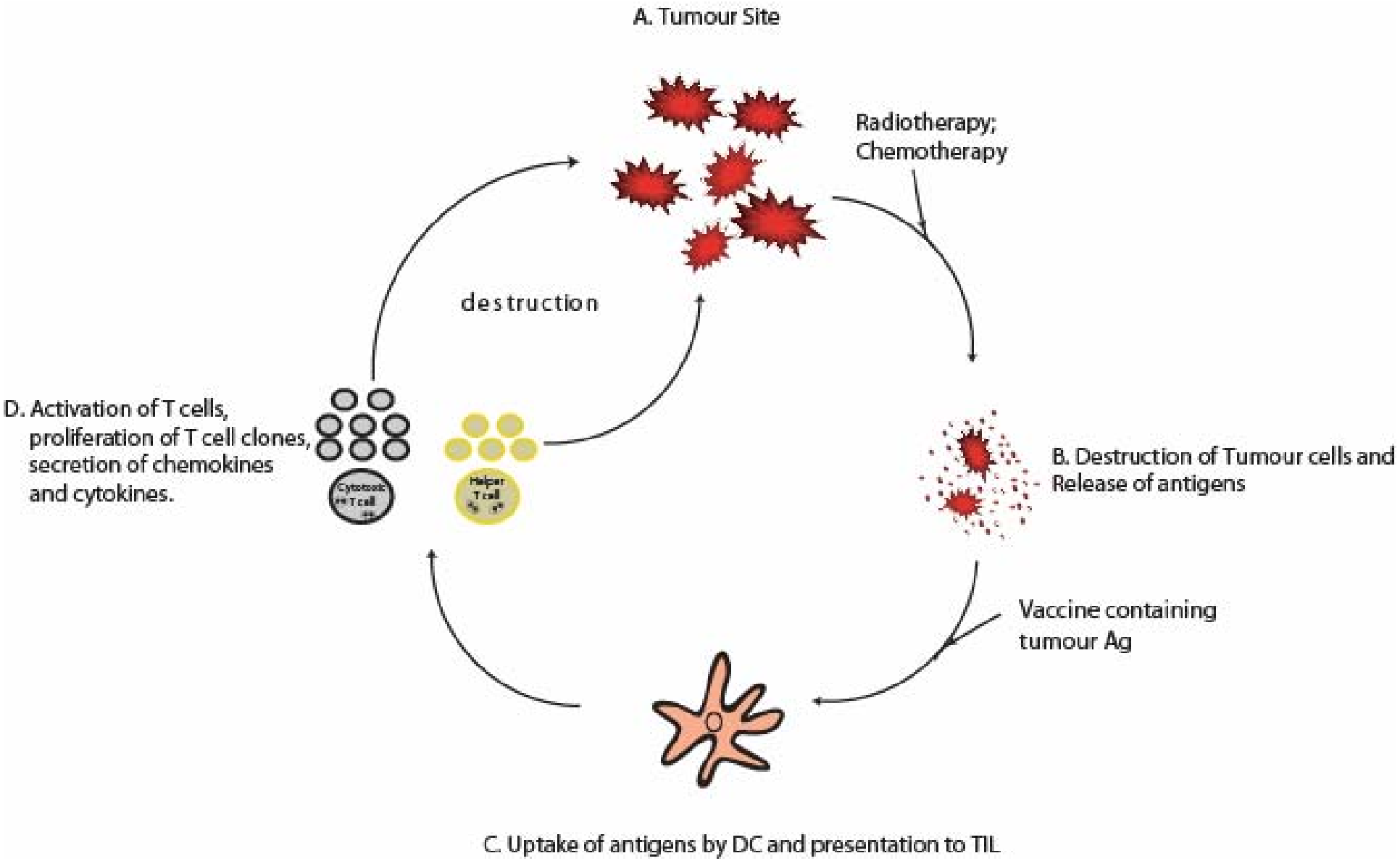
# Tumour development



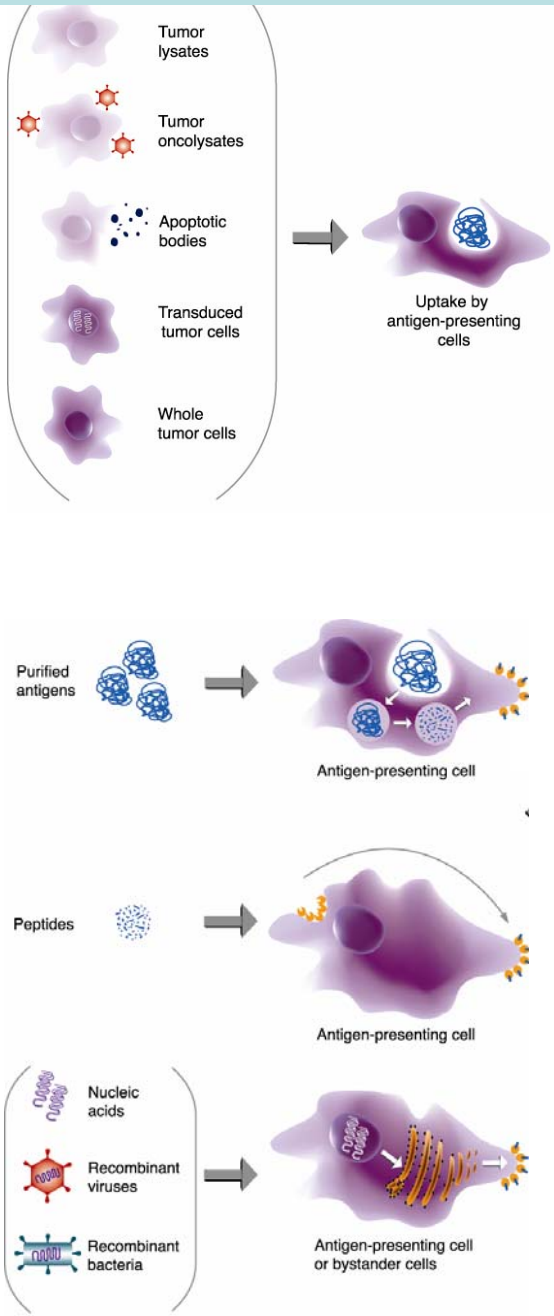
# Considerations

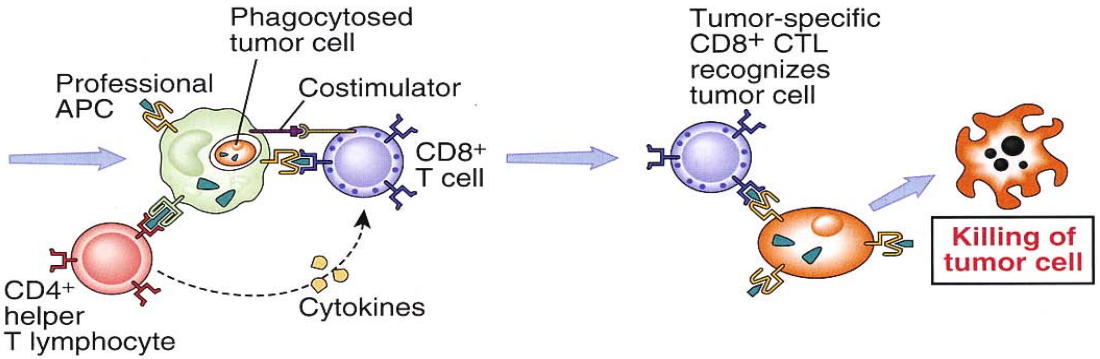


# Considerations



# T cell activation and tumour Lysis

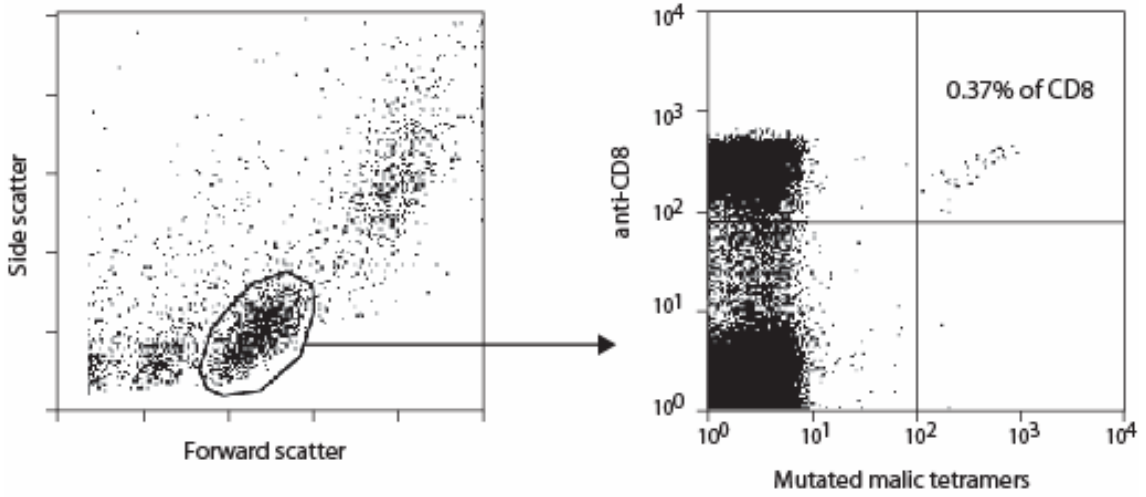


# Lung cancer Tumour Immunology

- T cells are present in tumour infiltrates
- No Lung Cancer specific antigen identified
- T cells against mutated Ag, hTERT, CEA etc

Labeling anti-malic T lymphocytes with tetramers




Karanikas et al; Cancer Res 2001