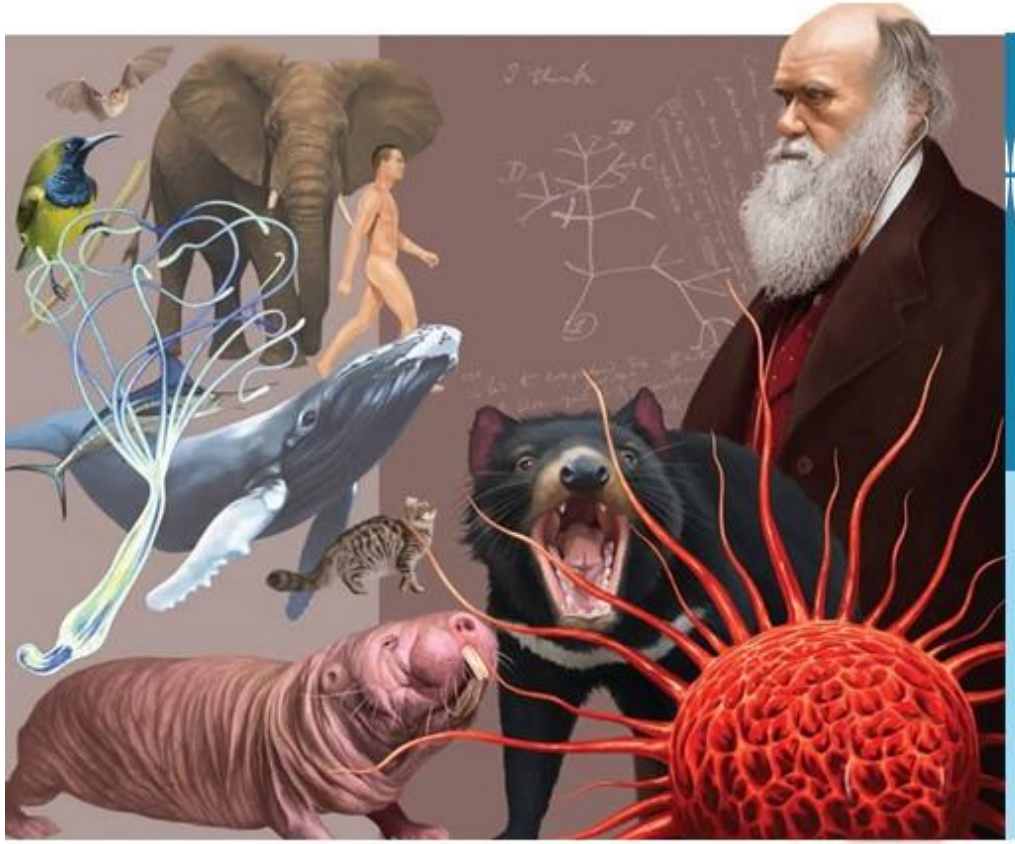
CREEC
Centre de Recherches Écologiques & Évolutives sur le Cancer

"The cancer mosaic, traits, strategies and adaptations"

WORKSHOP, 23-24 of AUGUST 2018, MONTPELLIER



Scientific Organizers

Benjamin Roche (CREEC)
Rodrigo Hamede (University of Tasmania)
Beata Ujvari (Deakin University)
Frédéric Thomas (CREEC)

Aim

Bring together experts in evolutionary biology, cancer biology, oncology and the intersection of these fields, in order to address topics in tumor growth and diversification, metastases, and cancer treatment.

cnrs DEAKIN UNIVERSITY IRD Institut de Recherche pour le Développement FRANCE MUSE UNIVERSITY of TASMANIA

creec

Centre de Recherches Écologiques & Évolutives sur le Cancer

Rodrigo Hamede | Beata Ujvari | Morgane Hénard | Dominique Faugère | Benjamin Roche | Frédéric Thomas


cnrs
INEE
Institut écologie et environnement
Martine Hossaert


Our aims
Understanding how cancer impact species evolution
Peto's paradox
Impact of cancer incidence on coexistence of animal species
Evolutionary epidemiology of transmissible cancer
Innovative knowledge for research in evolutionary ecology
Our ecosystem
Experimental capacities
Drosophila system
Modeling skills
Statistical and mathematical modeling
Field work possibilities
South of France
Australia
Benjamin Roche

CREEC is also an international laboratory

Centre de Recherches Écologiques & Évolutives sur le Cancer

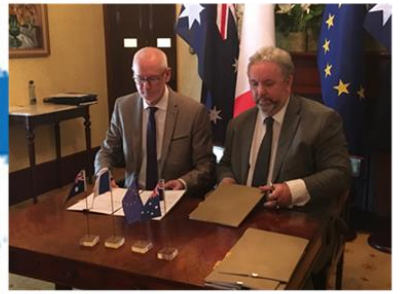
Mathieu Giraudeau

François Renaud

Fred Thomas

Benjamin Roche

May 2018



Bob Gatenby
Moffitt Cancer Center

Joel Brown
Moffitt Cancer Center

Pascal Pujol
CHU Montpellier

Laurent Lecam
INSERM,
IRCM Montpellier

Florence Bernex
INSERM,
IRCM Montpellier

Beata Ujvari
(Deakin University)

Rodrigo Hamede
(University of Tasmania)

Frédéric THOMAS

Hanna Kokko and Yağmur Erten

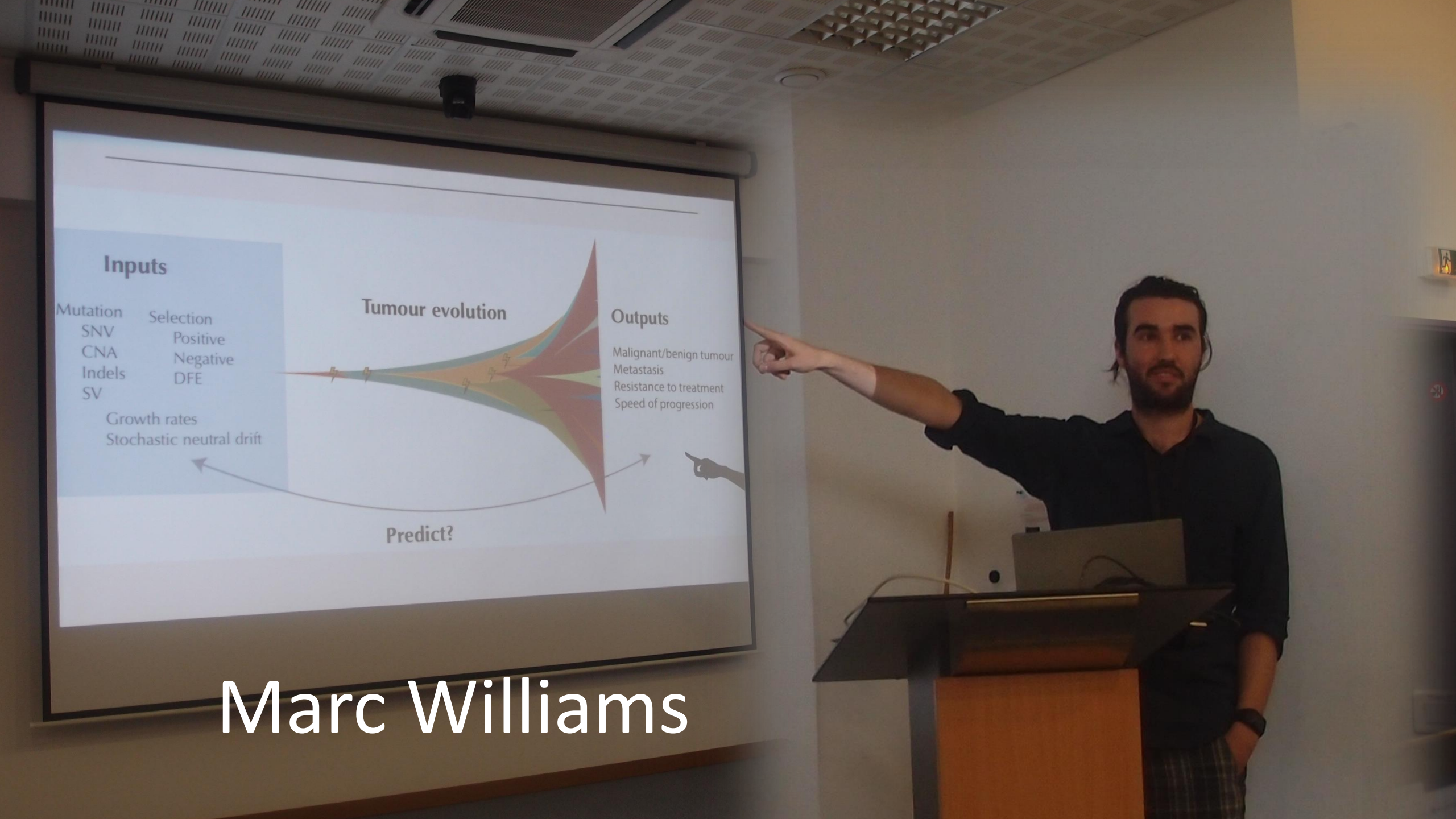

May the senescent-cell theory of aging explain the paradox of the decline in cancer incidence with age?
Pavard S and Metcalf CJE
Samuel Pavard


Peto's paradox: Is cancer suppression an evolving trait?
Len Nunney
Dept. of Evolution, Ecology & Organismal Biology
University of California, Riverside

Len Nunney


Problem #2: Peto's paradox – why large and long-lived animals do not develop more cancers
Artwork from:
Adaptive Oncogenesis: A New Understanding of How Cancer Evolves inside Us
by James DeGregori (Author), Michael DeGregori (Illustrator), Robert A. Weinberg (Foreword)
Harvard University Press
James DeGregori
Adaptive Oncogenesis
A NEW UNDERSTANDING OF HOW CANCER EVOLVES INSIDE US
James DeGregori


Using population genetic methods to infer the demographic parameters of an in vivo population of human stem cells from a combination of NGS data and single cell genomes
Henry Lee-Six, Nina Friesgaard-Oebro, Mairi Shepherd, Sebastian Grossmann, Kevin J. Dawson, Miriam Belmonte, Rob Osborne, Inigo Martincorena, Carlos Gonzalez Arias, Jacob Grinfeld, Elisa Laurenti, Brian Huntly, Mike Stratton, Tony Green, David Kent, Peter Campbell.
23 August 2018
Kevin Dawson



Marc Williams


Background
Tumour cells adapt and evolve through the acquisition
alterations that have phenotypic consequences.
the cell-
Such changes can give rise to novel peptides presented
surface, neo-epitopes, that elicit an immune response
23/08/2018
@QMBCI
Eszter Lakatos

Pierre Martinez

2

Randolph Nesse

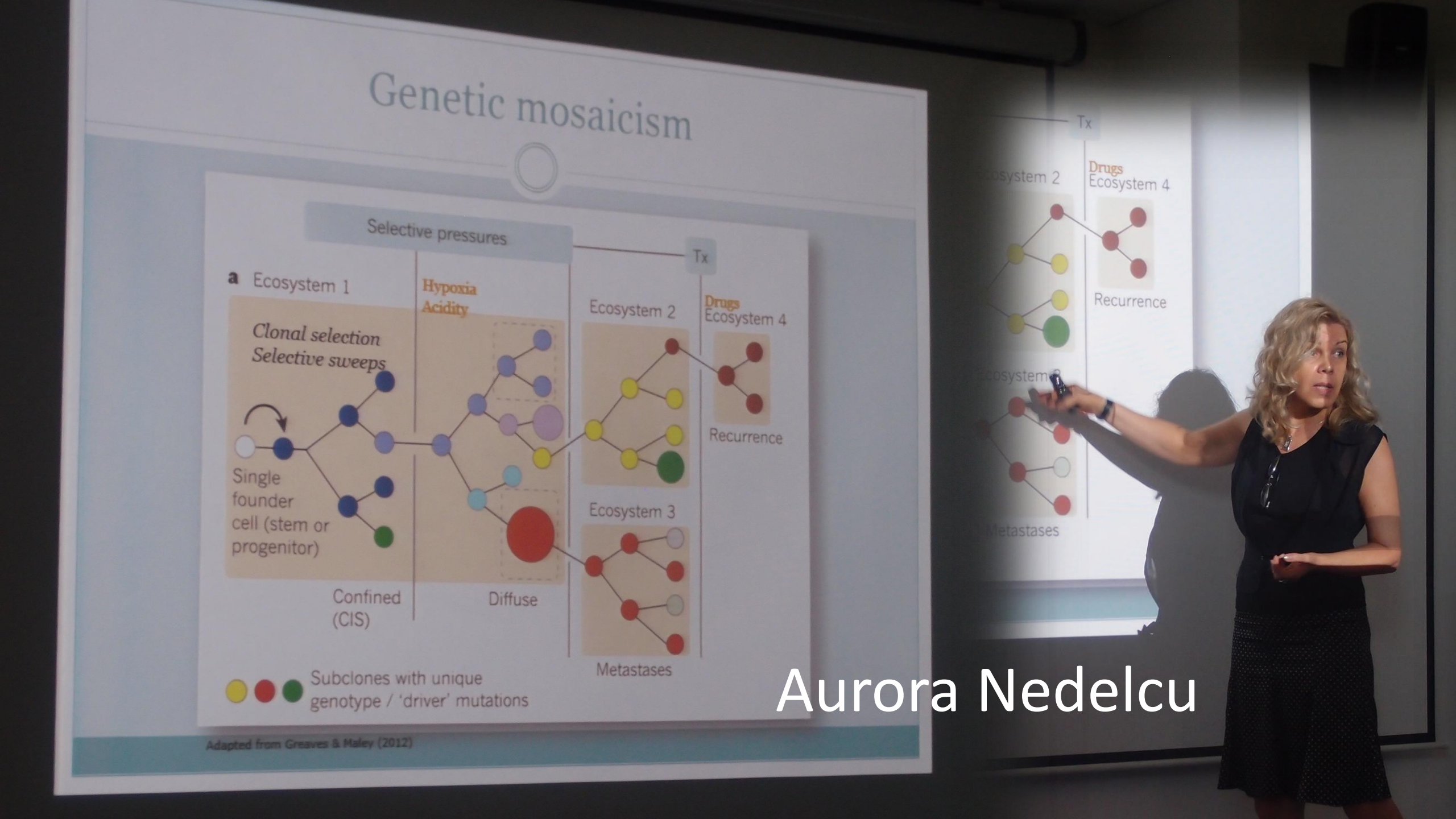
Marie Dutreix

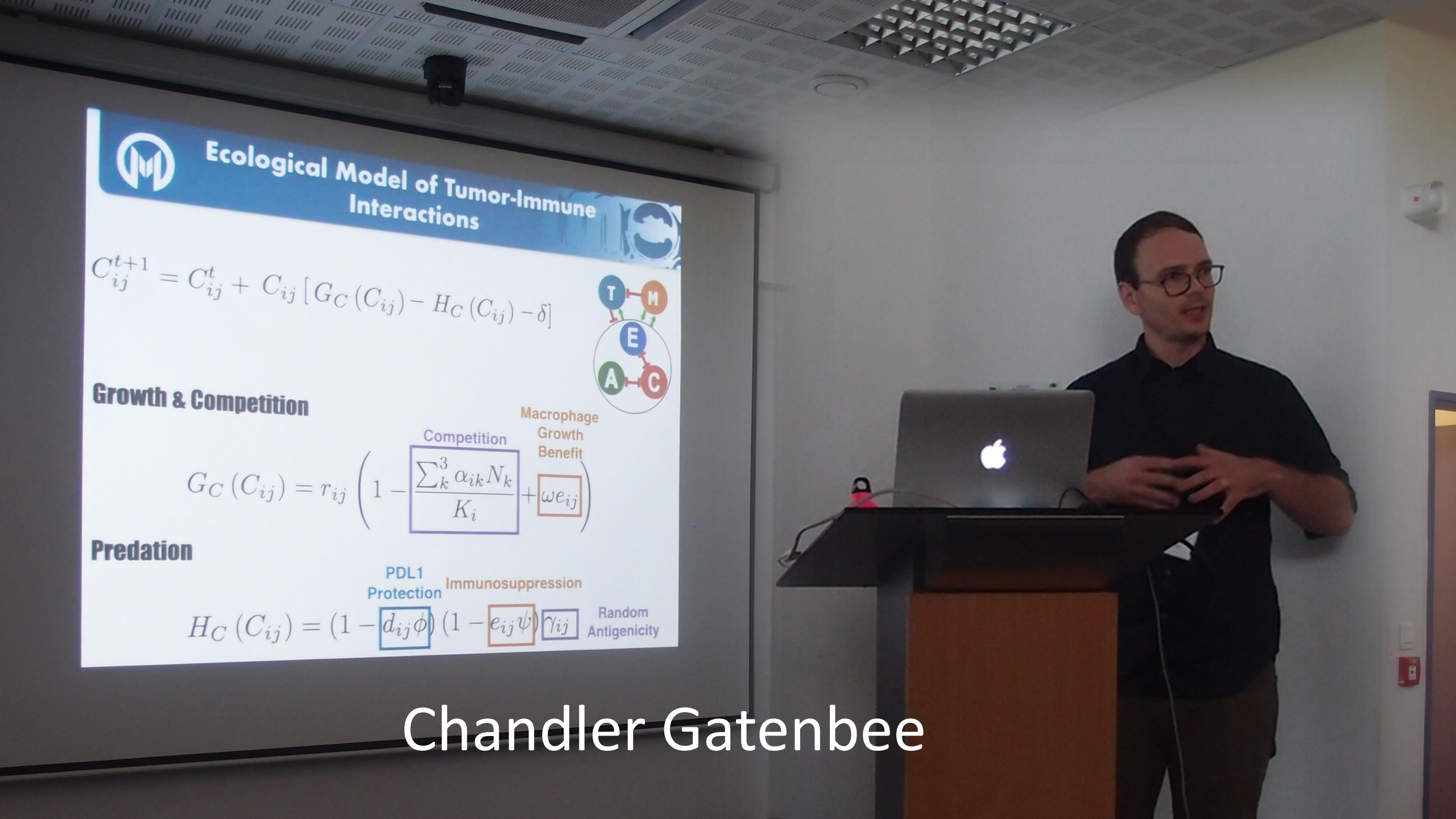
How can we define Cancer with a unifying vision that integrates research in human and non-human cancers?


can we define CANCER with a unifying vision that integrates research in human and non-human cancers?
Homework!!! Email Benjamin by lunchtime tomorrow
cology
finition:
netics
efinition:
ll Biology
efinition:
mmunology
efinition:
Disease Ecology
• Definition:
Evolutionary Biology
• Definition:
Therapeutics
• Definition:
Other
• Definition:

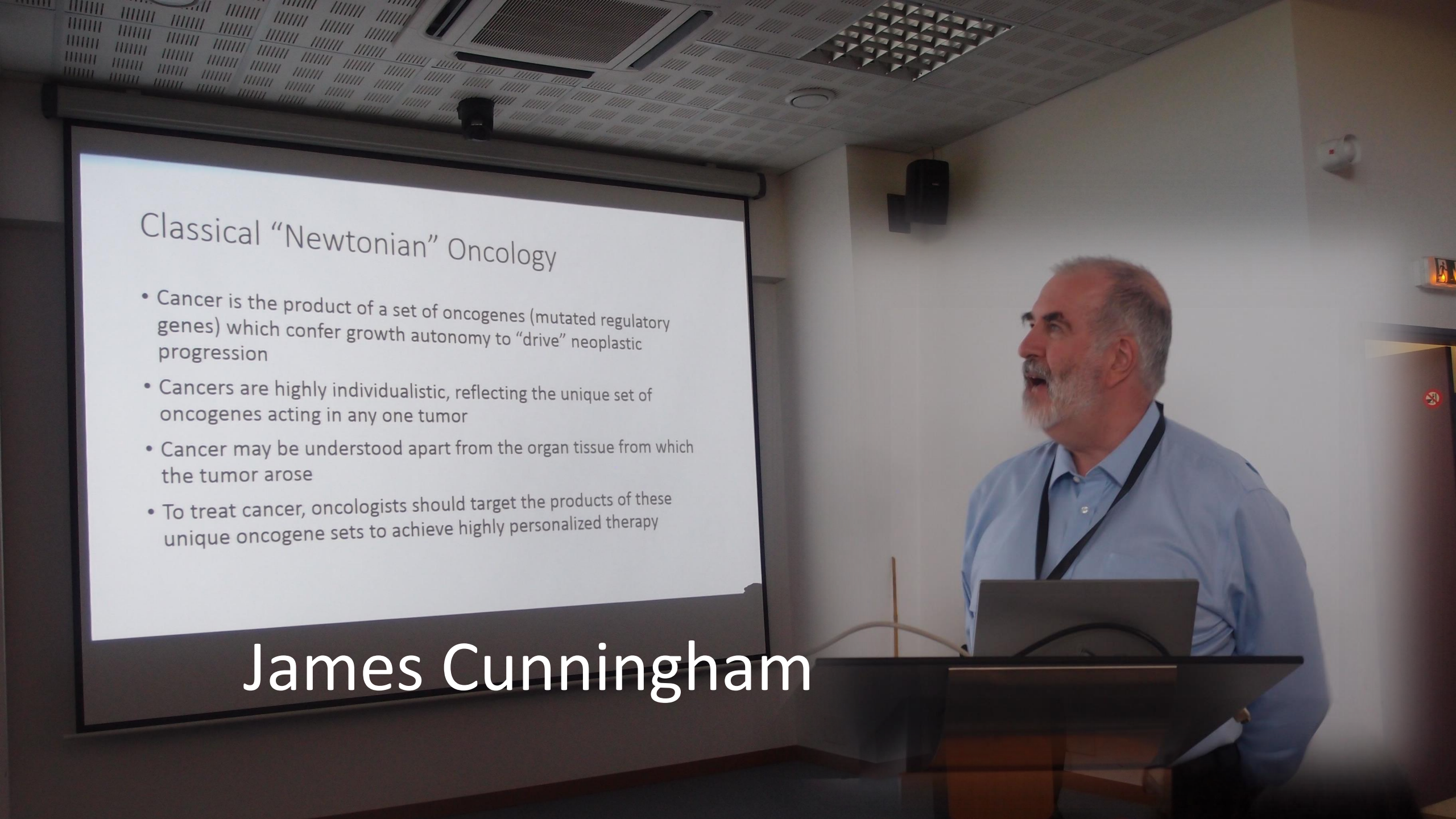

An inclusive theory on
competition and cancer treatment:
what to do with patients who respond "poorly"
to initial treatment
The Cancer Mosaic, Traits, Strategies and Adaptations.
Elsa Hansen
Center For Infectious Disease Dynamics, Pennsylvania State University

Elsa Hansen


Genetic mosaicism
Selective pressures
Tx
a Ecosystem 1
Hypoxia
Acidity
Ecosystem 2
Drugs
Ecosystem 4
Clonal selection
Selective sweeps
Recurrence
Single
founder
cell (stem or
progenitor)
Ecosystem 3
Confined
(CIS)
Diffuse
Metastases
Subclones with unique
genotype / 'driver' mutations
Adapted from Greaves & Maley (2012)
Aurora Nedelcu



Chandler Gatenbee


Classical "Newtonian" Oncology
• Cancer is the product of a set of oncogenes (mutated regulatory genes) which confer growth autonomy to "drive" neoplastic progression
• Cancers are highly individualistic, reflecting the unique set of oncogenes acting in any one tumor
• Cancer may be understood apart from the organ tissue from which the tumor arose
• To treat cancer, oncologists should target the products of these unique oncogene sets to achieve highly personalized therapy
James Cunningham

Rodrigo Hamede

They are evolved into the greatest body masses in the history of the earth

WHY THEY ARE SOOO BIG

AND DON'T HAVE CANCER ??

Maybe.....

With the increase in the body mass, they could develop molecular mechanisms to reduce damage in the DNA product of cell division and **reduce the cancer risk**

Daniela Tejada Martinez


The population genetics of
mussel transmissible cancer,
preliminary results
X50
Nicolas Bierne









TEINTURERIE


CAPMEDITROP
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