



FRAMING PANEL: ONE HEALTH

One Health in Oncology: Big Opportunities

O•N•C•O
oncologia clínica
FMRP USP

@colli_leandro

 leandroc@fmrp.usp.br

Leandro M. Colli, MD PhD

Division of Medical Oncology
Ribeirao Preto Medical School
University of Sao Paulo

**Newton Advanced Fellow
The Royal Society - UK**



Disclosures

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Advisory/Consulting : BMS, Novartis, Libbs, MSD, Roche

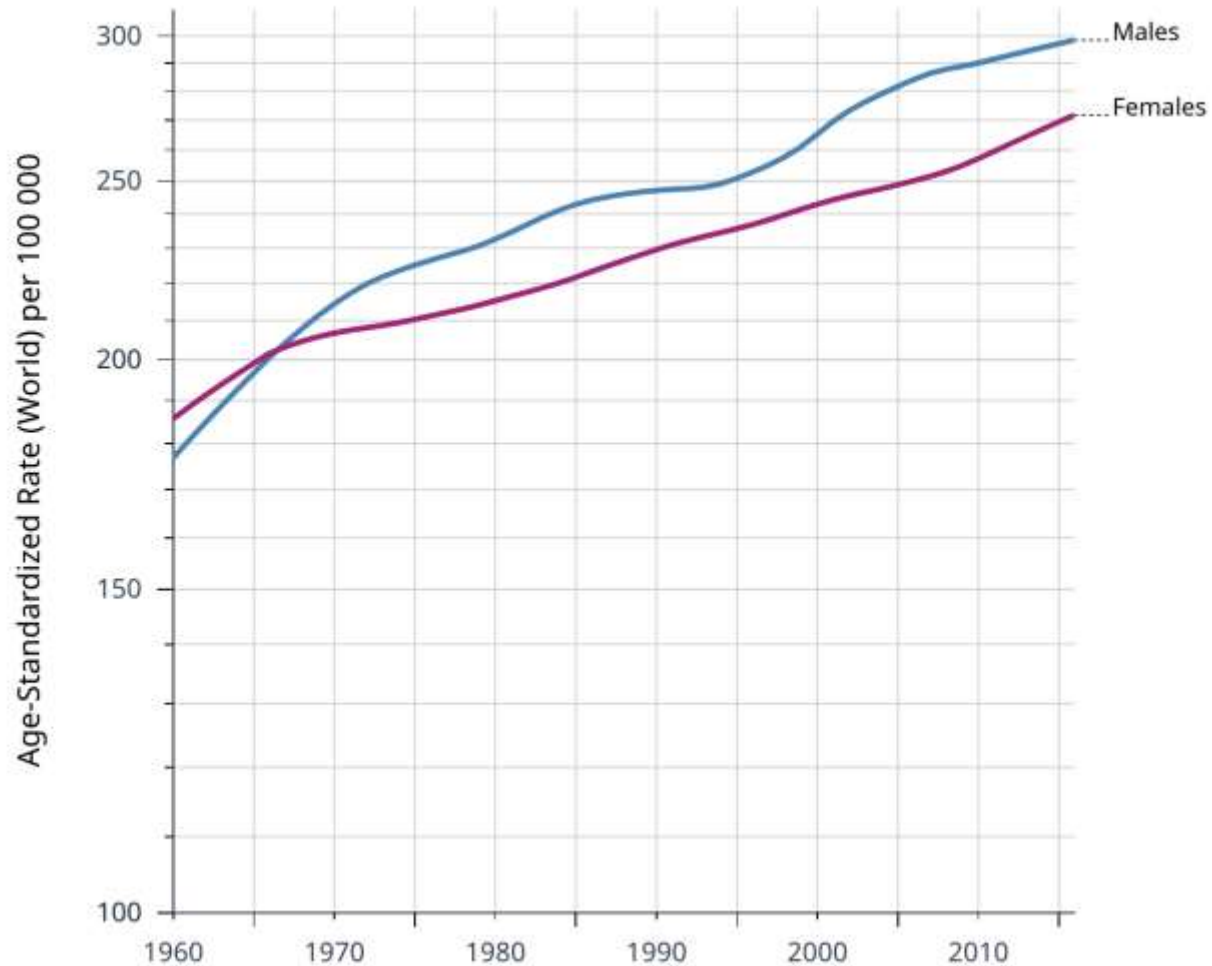
Travel Expenses: MSD, BMS, Janssen

Participation in Clinical Trials: AstraZeneca, Novartis, Janssen, MSD, Roche, BMS

Agenda

- **RISK: Uncover Cancer Susceptibility in Brazil.**
- **DIAGNOSIS: Understand local/regional cancer etiologies.**
- **TREATMENT: New Mechanisms for Immunotherapy Response**

The Burden of Cancer



The Epidemiology Perspective

- 1st mortality (developed World)
- 2nd mortality (World)
- Increasing rates
- **4 out 10 people**

**2020-2021 (US, Europe, and BR):
2x more deaths than COVID-19**

The Burden of Cancer

Adrenocortical Carcinoma

AIDS-Related Cancers

Kaposi Sarcoma (Soft Tissue Sarcoma)

AIDS-Related Lymphoma (Lymphoma)

Primary CNS Lymphoma (Lymphoma)

Anal Cancer

Appendix Cancer - see [Gastrointestinal Carcinoid Tumors](#)

Astrocytomas, Childhood (Brain Cancer)

Atypical Teratoid/Rhabdoid Tumor, Childhood, Central Nervous System (Brain Cancer)

B

Basal Cell Carcinoma of the Skin - see [Skin Cancer](#)

Bile Duct Cancer

Bladder Cancer

Bone Cancer (includes Ewing Sarcoma and Osteosarcoma and Malignant Fibrous Histiocytoma)

Brain Tumors

Breast Cancer

Bronchial Tumors (Lung Cancer)

Burkitt Lymphoma - see [Non-Hodgkin Lymphoma](#)

C

Carcinoid Tumor (Gastrointestinal)

Carcinoma of Unknown Primary

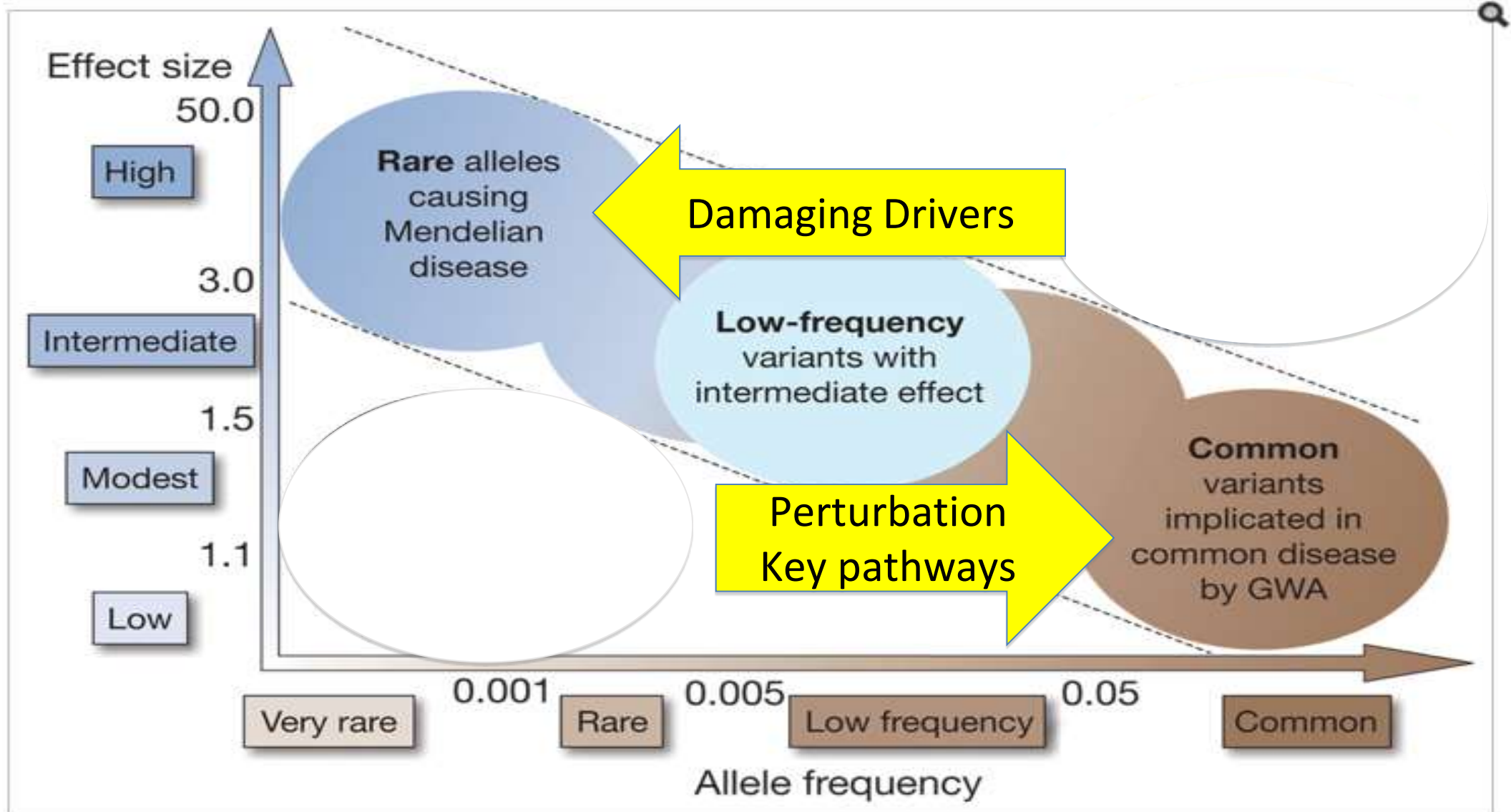
Cardiac (Heart) Tumors, Childhood

Central Nervous System

The Biology Perspective

- **Not** a single disease: > 130;
- What '*type*' of disease is cancer?
 - **Genetic:** two genomes
 - **Cellular:** all cell compartments
 - **Tissue:** regulation
 - **Metabolic:** energy and pathways
 - **Immunology:** immune evasion
 - **Evolution:** resistance
 - **Infectious:** HPV, microbiome, vaccine
 - **Environmental:** exposures

Architecture of Genetic Susceptibility of Cancer Defining Distinct Spaces



Published Cancer GWAS Etiology Hits: April 2024

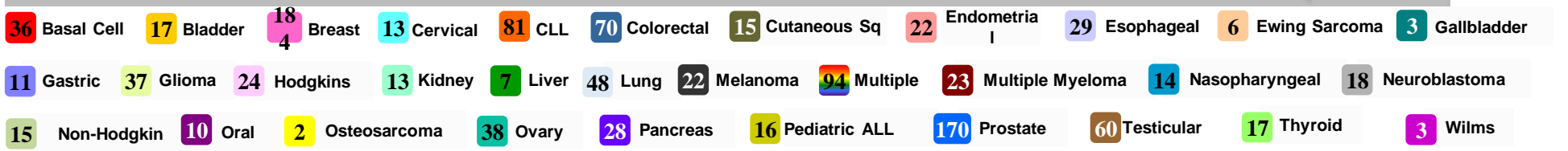
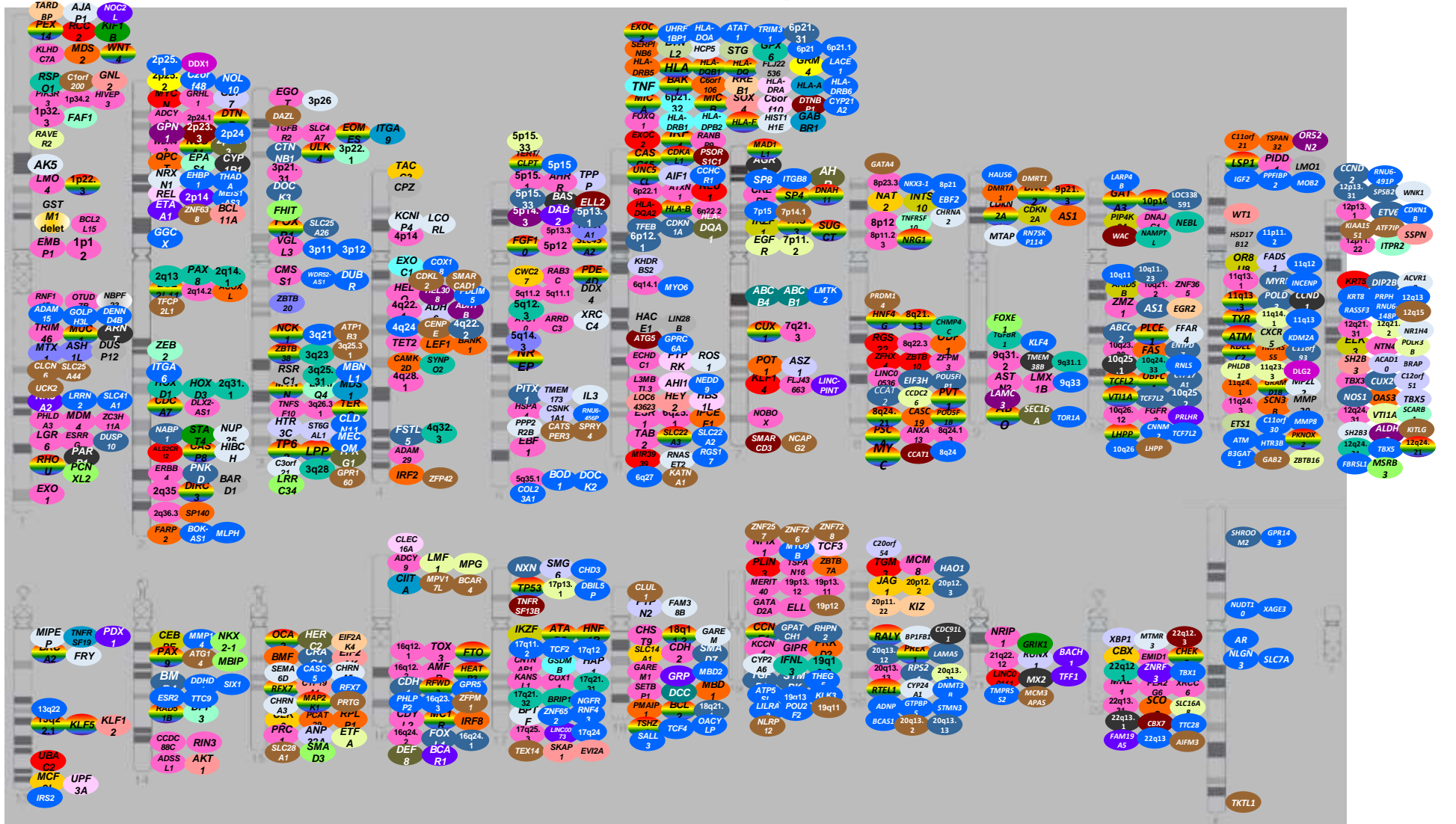
>1991 Disease Loci marked by SNPs

For > 32 "cancers"
Rare to Common

Adult Cancers
Estimated OR < 1.2

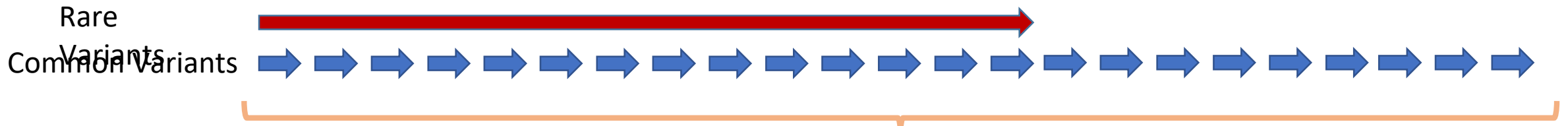
Disease Heterogeneity
Undermines Efficiency

~15% Pleiotropy
(shared between cancers)

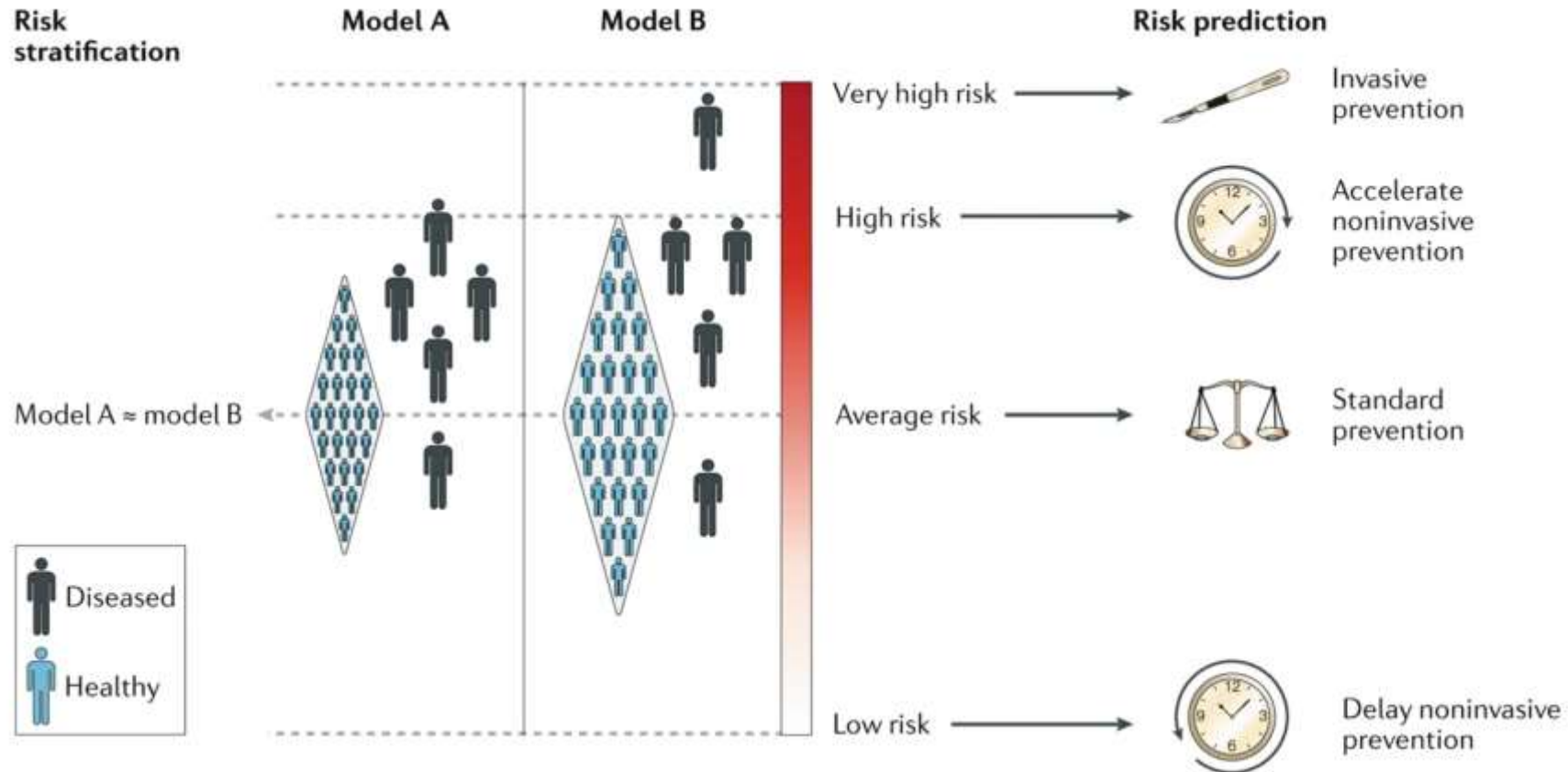


GWAS Catalog

Precision Prevention - Clinical Applications

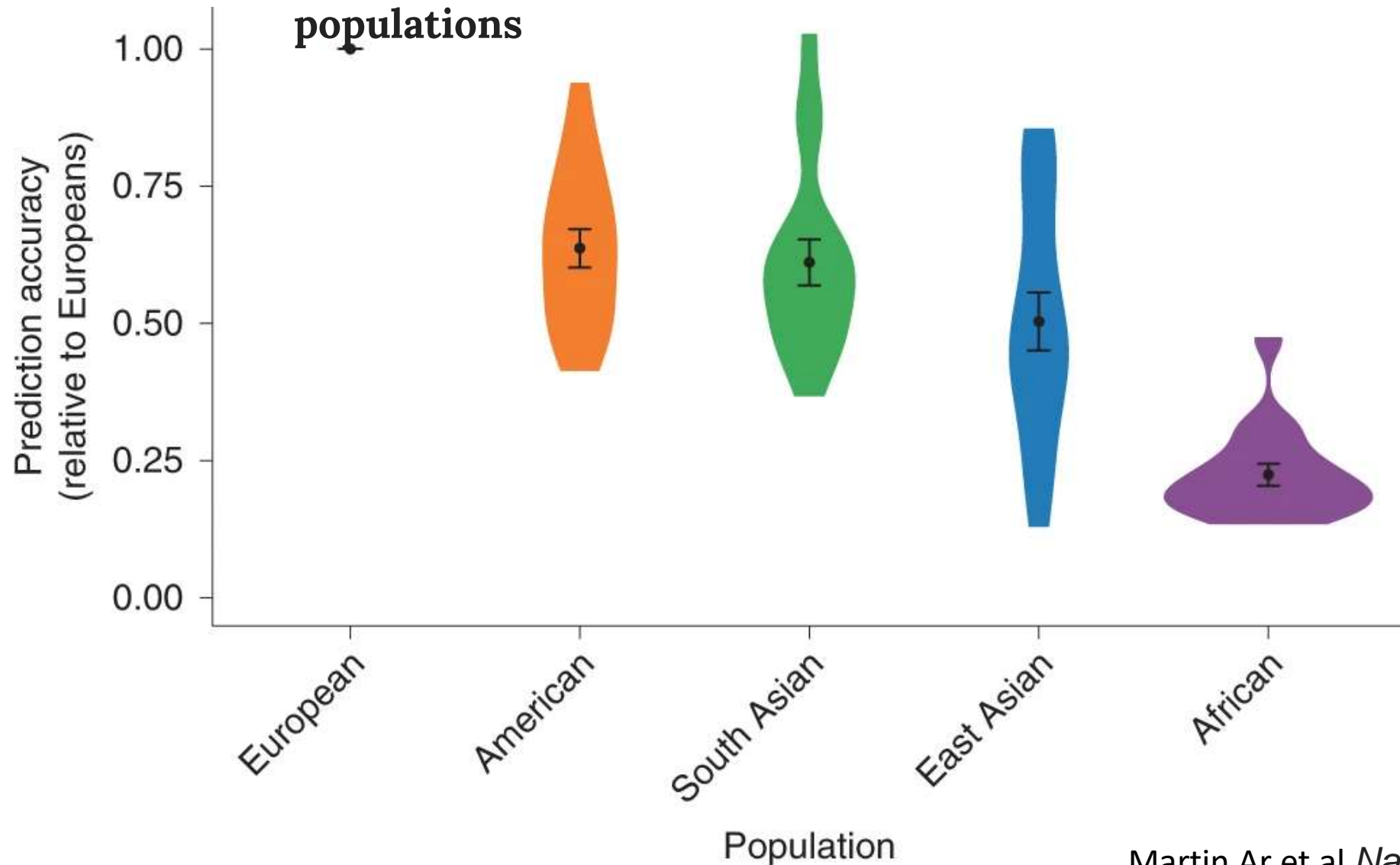


Polygenic Risk Score



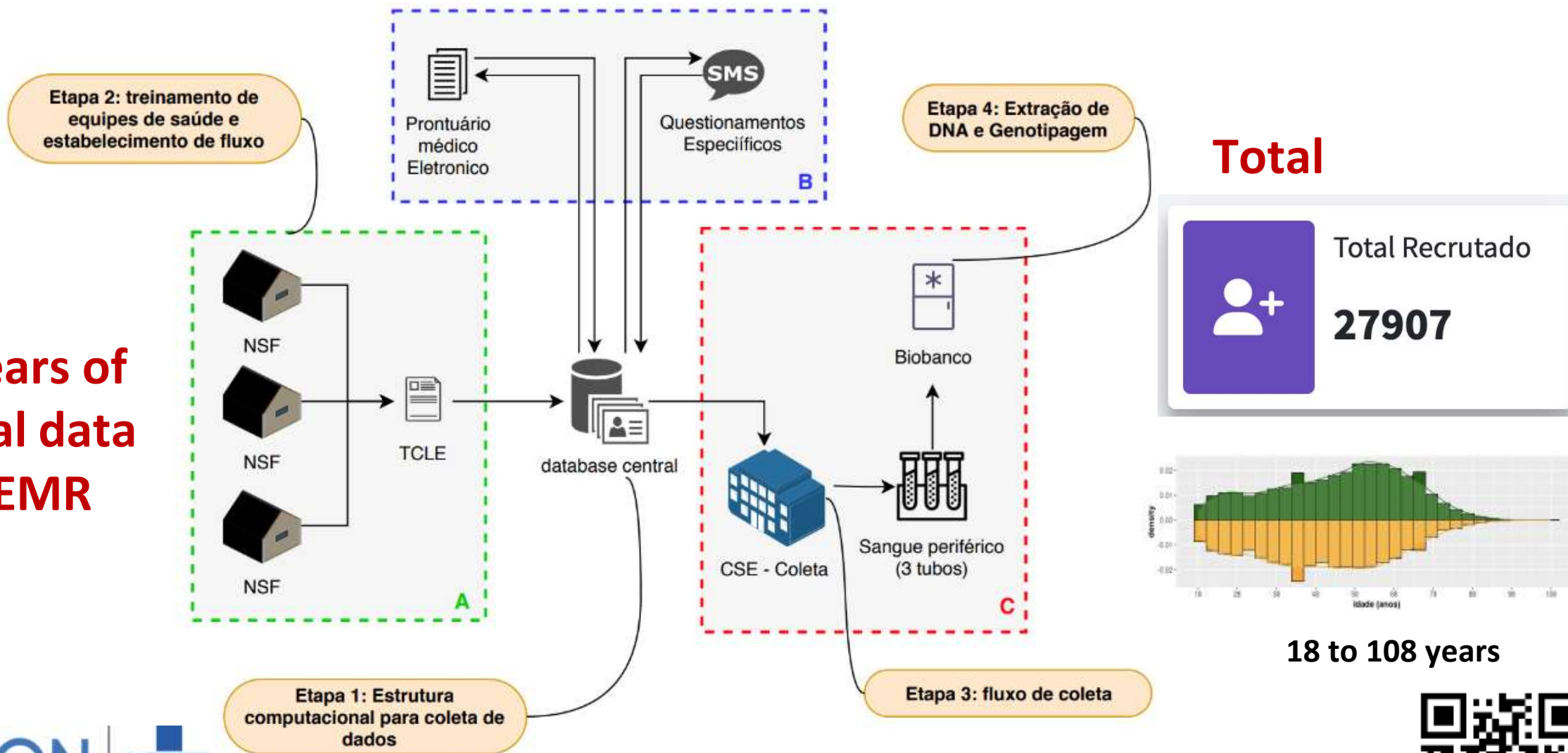
Will be Brazil out of Precision Prevention?

17 quantitative traits and 5 continental populations

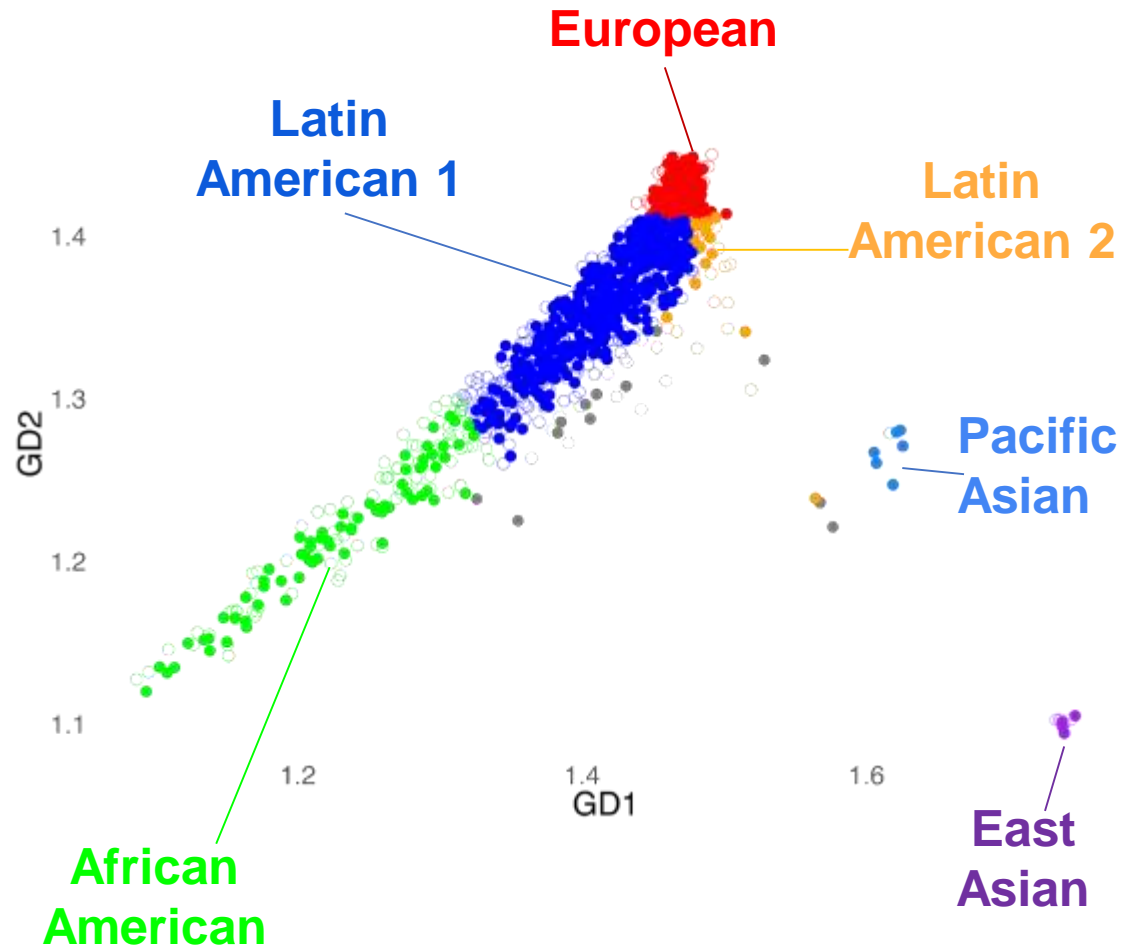


CoDiGo Project: susceptibility of an admix population

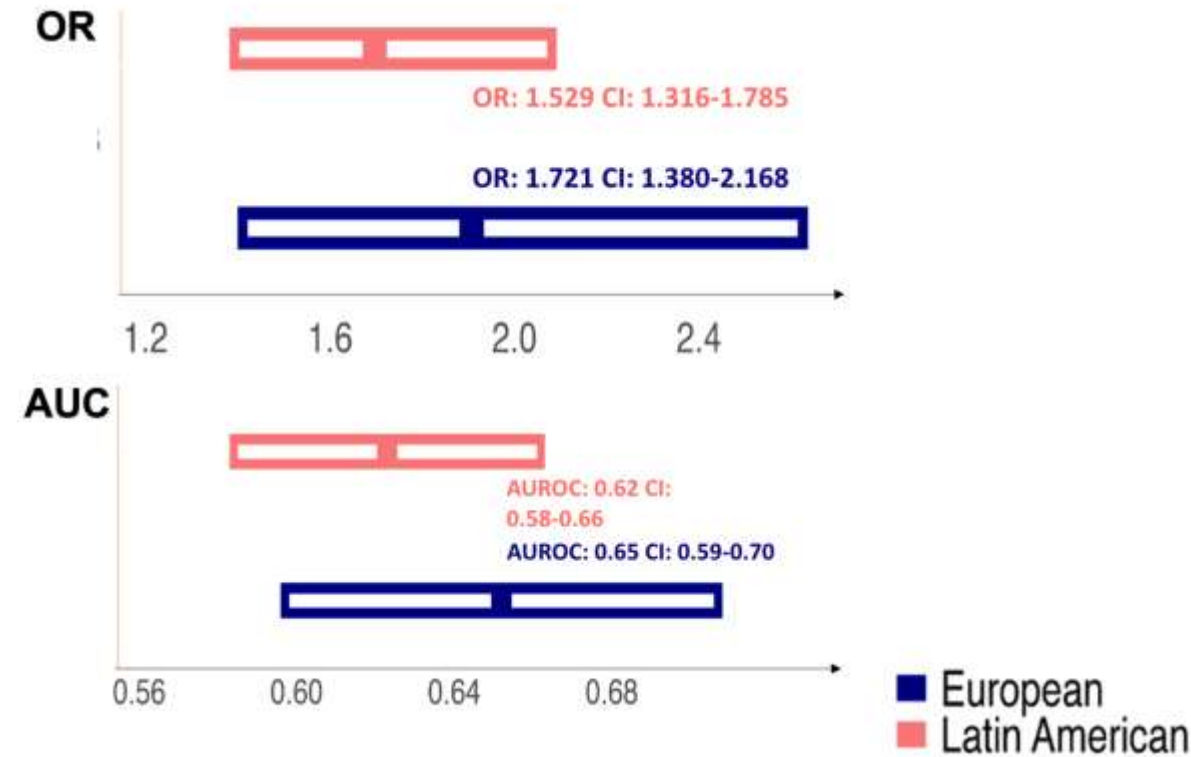
20 years of
clinical data
on EMR



CoDiGo Project: susceptibility of an admix population

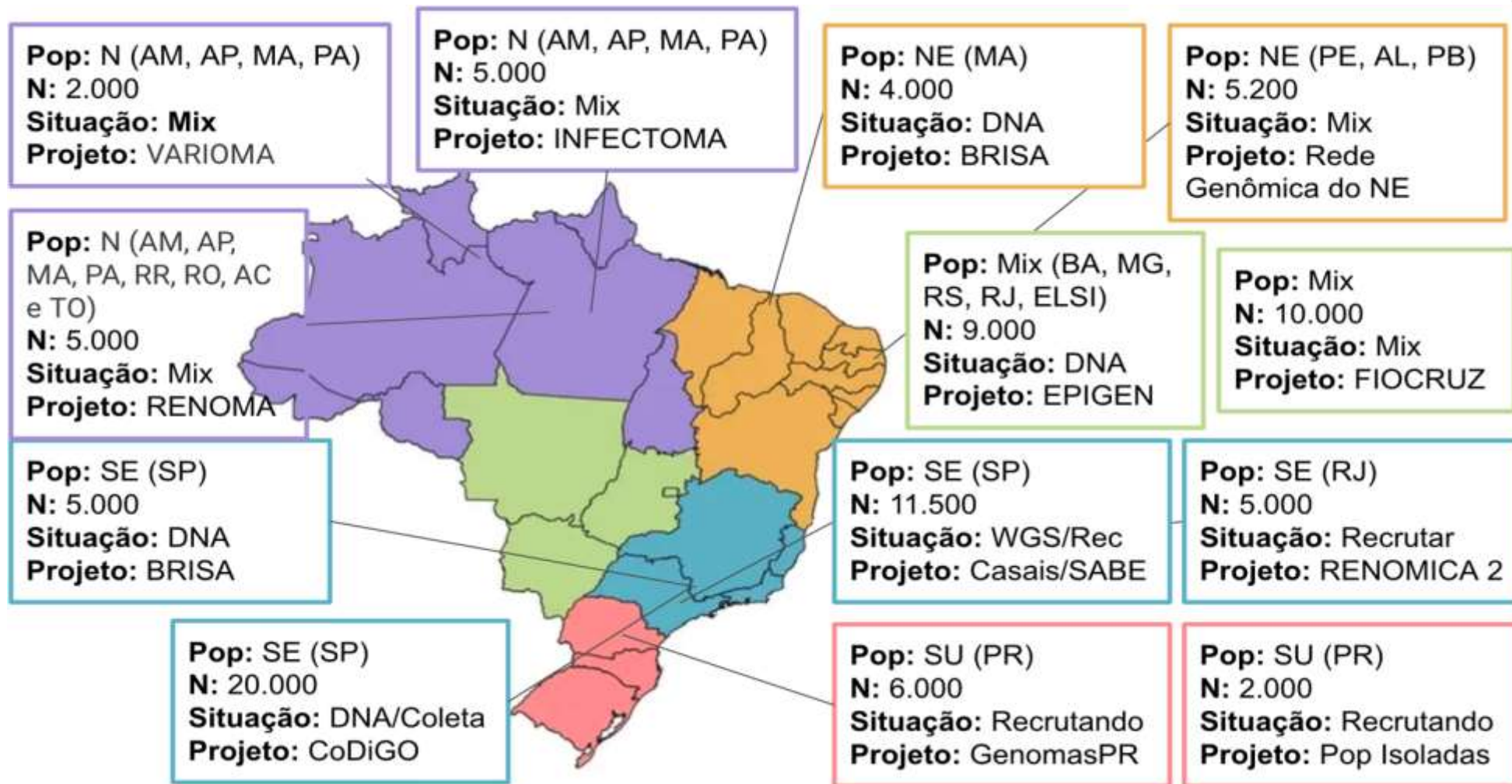


PRS has lower performance on non-EUR participants

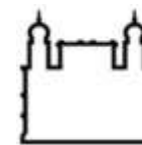


Genomas SUS

21.000 WGS samples that represents the Brazilian Population



UFRJ



FIOCRUZ
Fundação Oswaldo Cruz



IPEC
GUARAPUAVA



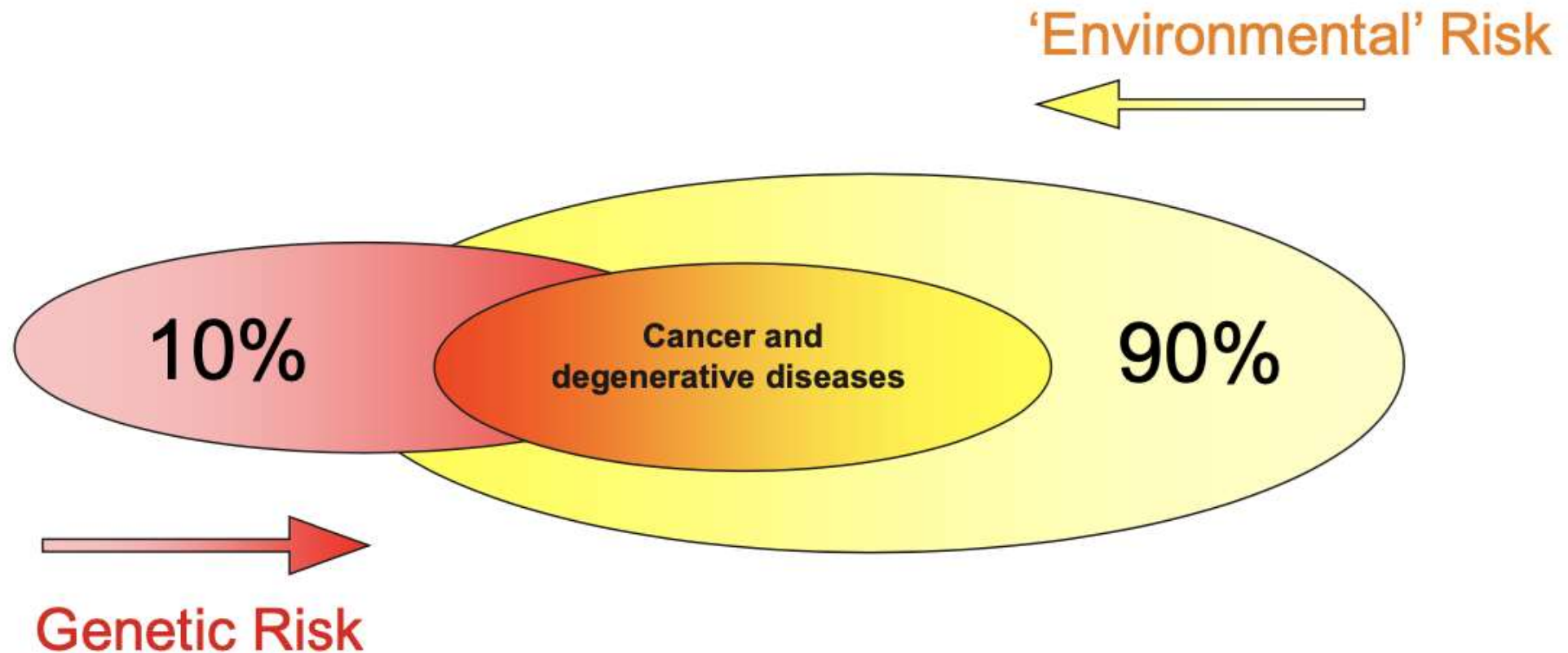
UNICENTRO
PARANÁ



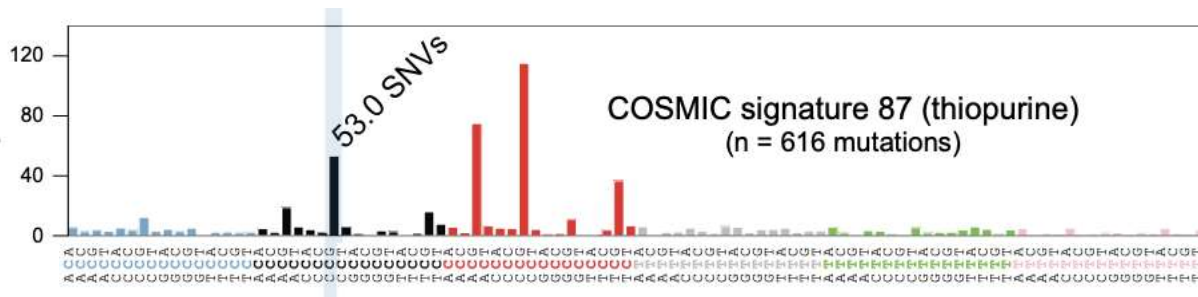
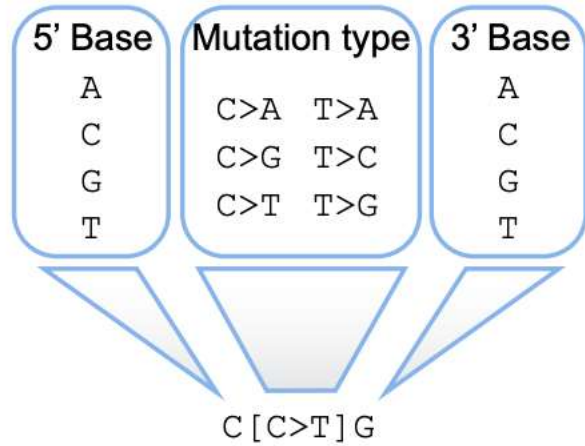
INC
INSTITUTO
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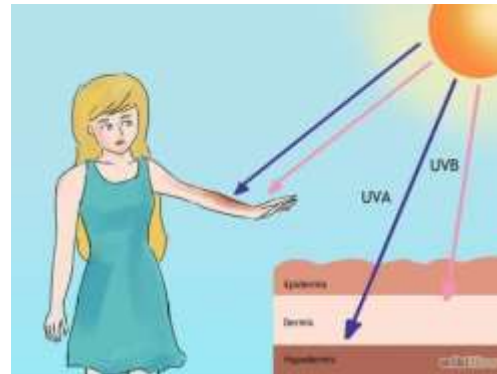
Genetics + Environment ~ Phenotype



CANCER MOLECULAR ETIOLOGY IN BRAZIL



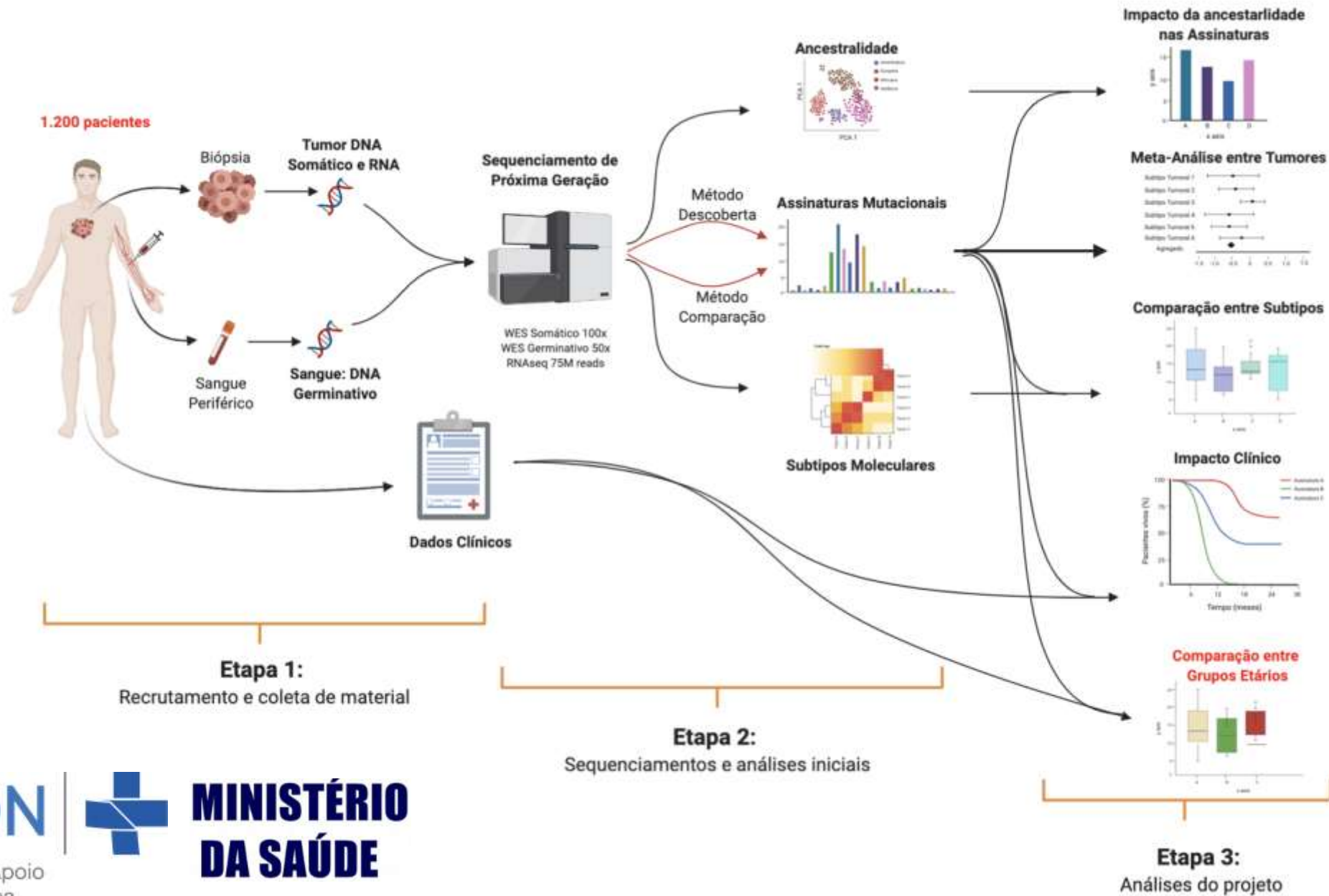
Chakravarty E. Nat Cancer 2021



Agenda

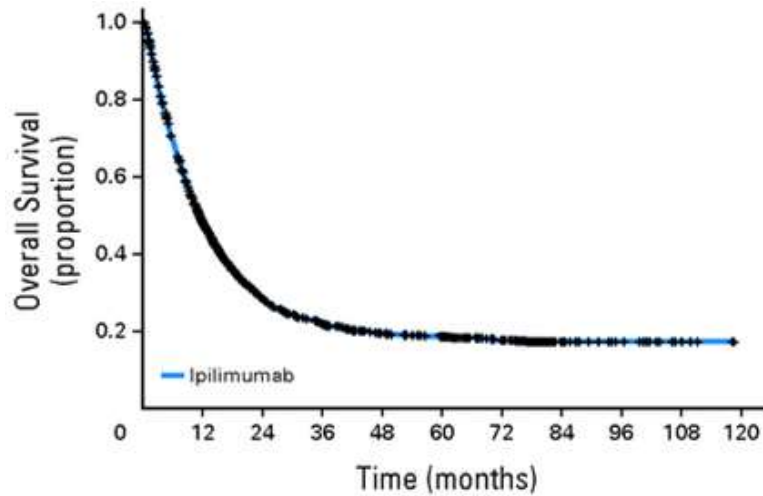
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CANCER MOLECULAR ETIOLOGY IN BRAZIL

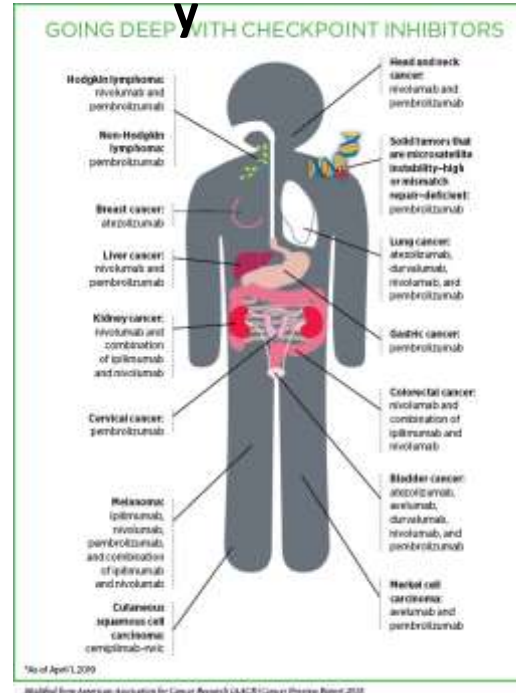


Immunotherapy: The Quest for Biomarkers

Response Variability



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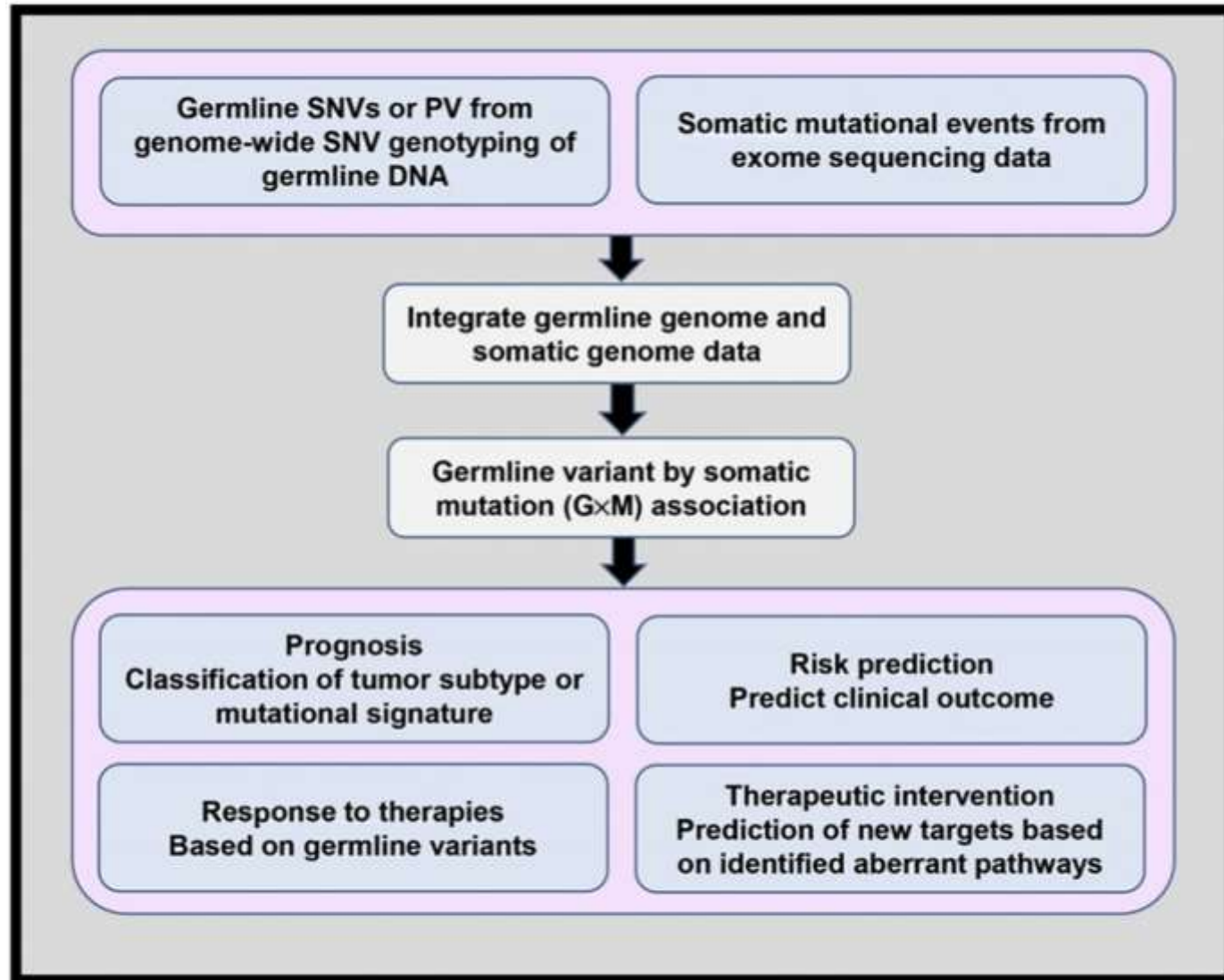


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Patient Selection

Financial Toxicity
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Germline-Somatic Interaction in Cancer





Financiamento Direto

MINISTÉRIO DA SAÚDE

Iniciativa Investigador

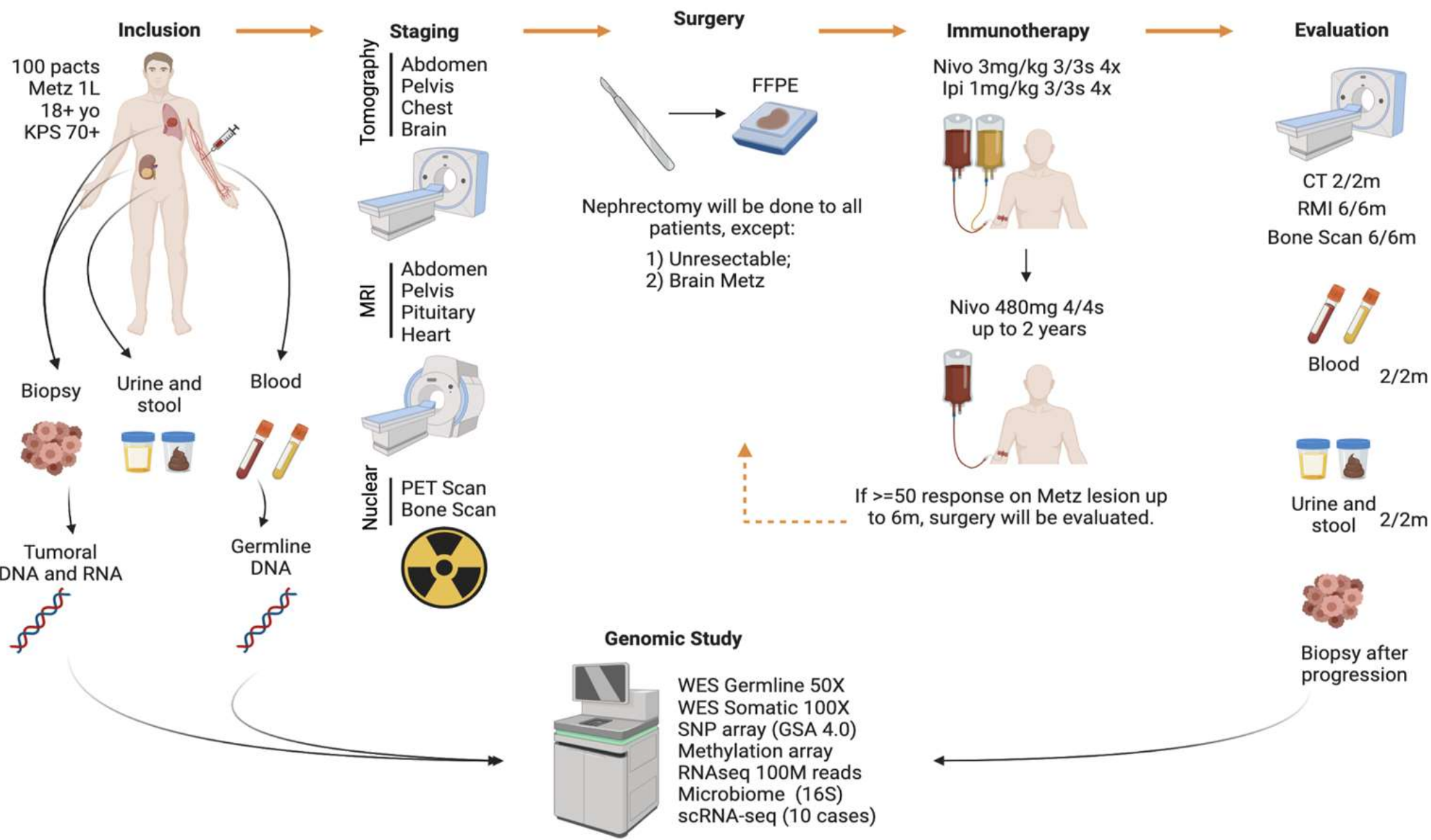


Bristol-Myers Squibb

Jovem Pesquisador



CLARA Trial: Characterization of Somatic and Germline Mechanisms that Impact the Immunotherapy Treatment and Prognosis of Patients with Renal Cancer



The Burden of Cancer




H. L. Mencken

“For every complex problem, there is a solution that is simple, neat, and **wrong.**”

Let's Collaborate: Together We're Stronger

Collaborations in Oncology:

- **Uncover Cancer Susceptibility in Brazil:**
 - Precision prevention  large comparative studies
- **Understand local/regional cancer etiologies:**
 - Genetic-epidemiology studies
 - Impact on cancer outcomes
- **New Mecanisms for Immunotherapy Response:**
 - Patient selection to reduce public system cost.

CONTACT



Laboratory of Translational Oncology

MEMBERS

Sabrina Baroni Fernanda Santos Stephen J. Chanock (NCI, USA)
Fernanda Coeli Andre Teles Ludmila Prokunina (NCI, USA)
Livia Bueno Barbara Mitch Machiela (NCI, USA)
Evelyn Onga Yasmin James Gulley (NCI, USA)
Tauana Vitor Girelli Mark Purdue (NCI, USA)
Vasconcelos Pierre Bigot (Angers, FR)
Maite Kolarik Oliver Delatre (Curie, FR)
Eli Van Allen (Harvard, USA)
Laurence Zitvogel (G. Roussy, FR)

POSTDOCS

Aline Souza
Virginia Silvestrini
Alison Pereira

GRADUAT

Marina Cormedi Cecília Soares
Letícia Andrade Camila Reis
Matheus Aquino Igor Alcantara
Fernanda Oliveira Carolina Furtado
Bianca Naomi Lucas Fernandes

UNDERGRADUAT

Letícia Helena
Livia Pinaso

COLLABORATO

Carolina Alves (G. Roussy, FR)
Niels Camara (USP, BR)
Rodolfo Borges (USP, BR)
Peter Radcliffe (Oxford, UK)
Rodrigo Calado (USP, BR)
David Mole (Oxford, UK)
Valdair Muglia (USP, BR)
Cida Koike (ICESP, BR)
Margaret de Castro (USP, BR)
Rui Reis (HAB, BR)
Alexandre Fabro (USP, BR)
Dirce Carrara (ACC, BR)
Aparecido Cruz (PUC-GO, BR)
Ken Gollop (Einstein, BR)

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Newton Advanced Fellow 2020



Breast Research Aiming Valuable Evidences



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Thank you for the opportunity!



INSTITUTIONS



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RESEARCH FUNDING



EMBRAPII
Empresa Brasileira de Pesquisa

CONTACT
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