THE FUTURE OF CANCER RESEARCH IN EUROPE

Professor Thierry PHILIP
President Managing Board, Curie, Institute Paris
President OECI

Brussels – February 12-13\textsuperscript{th}, 2019
“Integrating Genomics into personalized healthcare”
Pediatrician
Adult hematology
Bone marrow transplantation
Immunology
Director Lyon cancer center, 1989-2009
President French Federation Cancer Centers, 1997-2002
President National Cancer Commission, 2002

2004 – 2012 Vice-President Rhone-Alpes Region
2008 – 2017 Mayor Lyon 3rd District
2008 – 2020 Vice-President Lyon Metropole

2013 – now President Institut Curie
2018 – President OECI
From my experience
2 major Take home messages

We need to be open to change
Standard thinking

We need to understand why it doesn’t work before to make progress
European history of funding cancer research

2000
European Research Area (ERA)

2002
Commissioner Busquin creates the European Cancer Research Area (ECRA)

2005-2008
Funding of the EuroCan+Plus Project In FP6

2011-2015
Funding of the European Platform In FP7

2002
Conference "Towards Greater Coherence in European Cancer Research"

2008
- Eurocan+Plus report
- "Stockholm Declaration"
- ECCO creates the EACS and the Oncopolicy Committee

Organisation of European Cancer Institutes
H2020 (FP8)

**THE FRAMEWORK PROGRAMME FOR RESEARCH AND INNOVATION**

**HORIZON 2020**

- **Excellent Science**
  - European Research Council
  - Future and Emerging Technologies
  - Marie Curie Actions
  - Research Infrastructures

- **Industrial Leadership**
  - Leadership in Enabling & Industrial Technologies
    > Information and communication technologies
    > Nanotechnologies
    > Advanced materials
    > Biotechnology
    > Advanced manufacturing and processing
    > Space
  - Access to Risk Finance
  - Innovation in SME

- **Societal Challenges**
  > Health, Demographic Change and Wellbeing
  > Food security, sustainable agriculture, marine and maritime research and the bio-economy
  > Secure, clean and efficient Energy
  > Smart, Green and Integrated Transport
  > Climate Action, Resource Efficiency and Raw Materials
  > Europe in a changing world: Inclusive, Innovative and Reflective Societies
  > Secure Societies - Protecting Freedom and Security of Europe and its Citizens

**Joint Research Centre (JRC)**

**Widening Participation**

**Science with & for Society**

- European Institute of Innovation and Technology (EIT)
- Joint Programming P2P
- Joint Technology Initiatives P2B

**Organisation of European Cancer Institutes**
Proposed structure for HORIZON EUROPE (FP9)

**Pillar 1**
Open Science
- European Research Council
- Marie Skłodowska-Curie Actions
- Infrastructures

**Pillar 2**
Global Challenges and Industrial Competitiveness
- Health
- Inclusive and Secure Society
- Digital and Industry
- Climate, Energy and Mobility
- Food and natural resources
- Joint Research Centre

**Pillar 3**
Open Innovation
- European Innovation Council
- European innovation ecosystems
- European Institute of Innovation and Technology

**Strengthening the European Research Area**
- Sharing excellence
- Reforming and Enhancing the European R&I system

EU-BUDGET FOR THE FUTURE, published on June 7, 2018
Preface by Pr Mariana Mazzucato

“I look at what we can learn from the missions of the past – like the Apollo Program – and how to apply those lessons to the more complex challenges of today. A key lesson is that missions must be bold, activating innovation across sectors, across actors and across disciplines. They must also enable bottom-up solutions and experimentation.

Missions provide a massive opportunity to increase the impact of European research and innovation, grasp the public imagination and make real progress on complex challenges.

Mission-oriented policies can be defined as systemic public policies that draw on frontier knowledge to attain specific goals or “big science deployed to meet big problems”. Mission provide a solution, an opportunity, and an approach to address the numerous challenges that people face in their daily lives”.

Organisation of European Cancer Institutes

Julio E. Celis¹ and Dainius Pavalkis²

¹ Danish Cancer Society Research Centre, Copenhagen, Denmark
² Department of Surgery, Lithuanian University of Health Sciences, Kaunas, Lithuania

Vision 2030 for the optimal approach to cancer research and care in Europe: a mission or a Network of Networks?

Thierry Philip¹, Geneviève Almouzni², Philip Poortmans³

¹ Institut Curie 73 rue Claude Bernard 75005 Paris, France
² Institut Curie Research Center, PSL University, CNRS, UMR3664, Sorbonne Universités, UPMC Paris, France
³ Marie Curie Professor Paris Science & Lettres – Institut Curie 73 rue Claude Bernard 75005 Paris, France
2030 – Long term survival of 3 out of 4 cancers patients “in countries with well developed healthcare systems”:

- By combinaison of innovation, prevention and treatment strategies
- With handling of economic and social inequalities in countries with less developed system.
- Priority to two gaps:
  - Between preclinical and clinic research
  - Between clinical and outcome research
- **Prevention:** Cancer Prevention Europe+/- IARC
- **Early diagnosis and screening:** Cancer Prevention Europe, ECCO and Comprehensive Cancer Centers (Including prevention of relapse and early diagnosis of relapse).
- **Basic research:** EU-LIFE is needed
- **Clinical research:** EU-LIFE, EORTC, EOCI, Cancer Core Europe, National groups
- **Outcome research:** OECI and National groups

**IF ONE MISSION THE CANCER FAMILY SHOULD BE UNITED**
The 1st Gago Conference on European Science Policy on « Policyic Perspectives for Cancer Research in Europe », Porto, Portugal
February 14th 2018

A Mission-oriented approach to cancer in Europe: Boosting the social impact of innovative cancer research
Organized by the Pontifical Academy of Sciences and the European Academy of Cancer Sciences
Casina PIO IV, VATICAN City, November 15-17th 2018
- Everybody should be accepted in the Mission based on quality of their Network

- Discussion should be open and cancer core is one of the partners and patients should be the cement between the partners.

- Nobody seems really clear with Apollo Mission at this point.
The choice of a Pediatric Mission had some logic according to Mazzucato definition of a Mission
THE SIPOE
STRATEGIC PLAN
A European Cancer
Plan for Children and
Adolescents
Questions about a putative mission on Cancer in the adult setting

Q1 Selection process
Q2 Governance
Q3 As simple and clear as Mission Apollo
“.... 1 - For each mission, a mission board shall be appointed by the Commission, following a transparent and open process.

The mission board still be composed of maximum 15 high level experts representing balanced sectors and interests, including relevant end-users’ representatives, and selected in accordance with Article 237 of the Financial Regulation. It shall operate according to the principles of autonomy, transparency and accountability. For each mission, 2 to 4 board members shall be appointed by the European Parliament.” ....
“…. (a) Content of work programmes and their revision as needed for achieving the mission objectives, in co-creation and co-design with all relevant stakeholders ”...
REPORT

This meeting followed an OECI Board proposal to launch a European Cancer Mission Working Party to discuss on how OECI WGs may contribute to the upcoming FP9 Framework Programme where a small number of “Missions” with specific goals are foreseen.

OECI decided to invite all the chairpersons of our WGs plus putative partners such as ECCO, EORTC, ECPS, ESO, UNICANCER, Alleanza Contro il Cancro, EULIFE, IARC Cancer Prevention Europe, ECL. All the putative partners responded positively.
At the end we had agree on the following tittle: Towards innovations to control cancer for all:

- The challenge seems to be clearly “to defeat the tsunami of cancer through major innovation using networking to build a European cancer ecosystem responding both to patients’ perspectives and to the necessity to find new tools to innovate in all domains of the cancer fight”.
- We need to unify the cancer family, to connect with industry and also with member states.
- Patients representatives and ECCO seem to be good candidates to lead a mission since we think difficult to be the conductor of the orchestra and the player of the instruments at the same time. The legitimacy of patient representatives is mandatory.
- We should avoid to build a classic cancer family project with various work packages on prevention, early diagnosis, screening, basic, translational and clinical research, outcome research... without demonstrating clearly the promotion of innovation with new organisations and new tools as well as the aim of reducing inequities and give access to quality services.
MINUTES

Thierry Philip, Nov 28, 2018

Workshop on

A MISSION-ORIENTED APPROACH TO CANCER IN EUROPE:

BOOSTING THE SOCIAL IMPACT
OF INNOVATIVE CANCER RESEARCH

VATICAN, November 16-17th, 2018

Organisation of European Cancer Institutes
Topics and priorities for the mission and/or proposal to calls should be driven by public and patients perspectives in collaboration with healthcare professionals.

The burden of cancer is such that we have to take care of 3 different populations:
- The patient to be still healthy person (public) through prevention
- The patient actually diagnosed and treated through best diagnosis & treatment from their diagnosis to their end of life, with not only the aim of improving survival but also with the aim of improving quality of life.
- The patient surviving their cancer by taking care of their short and long term toxicities and by giving them the ability to retrieve a normal professional and personal life.

Our aims are to achieve:
- Reduction of the incidence of cancer by prevention
- Improve the survival and quality of life of the cancer patients during their treatment
- Improve the quality of life and the rehabilitation of surviving patients

With the best quality and less possible costs (efficiency) true integrative care for all by reducing the inequities.
Our means to achieve those goals are:

- Research and innovation in all the fields
- Education of the public (prevention), the patients (care & survivorship/prevention of relapse) and the professionals (care)
- Evaluation of the outcome improvement.

The tools that we need are IT tools and BIG data

All this may be done through an important networking of Clinical and Comprehensive Cancer Centres, General Hospitals and primary care (general practitioners, home care, quality of life centers...)

All the European Organisations concerned by cancer should join their forces in order to improve quality and efficiency of true integrative care for all.
DEFEATING THE TSUNAMI OF CANCER IN EUROPE THROUGH INNOVATION

Public & Patients Perspectives

Prevention
Care Diagnosis Treatment
Survivorship

QUALITY EFFICIENCY
TRUE INTEGRATIVE CARE FOR ALL

Research & Innovation in all fields
Evaluation of outcome
Education
- public
- patients
- professionals

IT Tools
BIG Data

NETWORKING
CCC – General Hospitals – Primary care (GP...)

Organisation of European Cancer Institutes
Major conclusions

- Improving the measurement of quality cancer care
- Addressing financial discrimination endured by cancer survivors
- Better integrating primary care to improve cancer care
1) By 2023 an agreed set of care standard and evidence based indicators to measure the quality of all cancer services in European countries should be in place.

2) By 2025 in respect to accessing financial services the right of cancer survivors not to declare their cancer 10 years after the end of the active treatment and 5 years if they had cancer under 18 should be codified across European countries.

3) By 2025 all national cancer plans in Europe should contain ambitious and measurable goals and actions to improve primary care, healthcare professionals and informal carers within multidisciplinarity care to patient.
What is the OECI Accreditation and Designation aiming to achieve?

- To drive genuine improvements for patients
- To provide an independent and objective external quality assessment of Centres
- To provide quality standards which are ambitious in terms of excellence
- To provide pan-European standards which meet EU concerns about equity of access for patients

Thus: we can use pan-European quality standards to measure clinical and research excellence and improvement.
European overview

Clinical Cancer Centre 15 ⇒ 18%
Comprehensive Cancer Centre 19 ⇒ 23%
In the accreditation Process 7+ ⇒ 8%

Almost 50% Of our European members
<table>
<thead>
<tr>
<th>DIFFERENCE BETWEEN COMPREHENSIVE AND CLINICAL CANCER CENTERS</th>
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<tr>
<td><strong>COMPREHENSIVE</strong></td>
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<tr>
<td>- A minimum of 150 beds and 50 physicians dedicated to cancer</td>
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<td>- Annual budget &gt;50 million including 8 million for cancer</td>
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<tr>
<td>- &gt;2500 new cases/year</td>
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<td>- &gt;125 per review with impact factor &gt;10</td>
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<tr>
<td>- &gt;50 between 5 and 10 impact factor</td>
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<td>- &gt;75 open studies</td>
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<td>- &gt;10% patients in clinical trials</td>
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<tr>
<td><strong>CLINICAL</strong></td>
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<tr>
<td>- 100 beds and 30 physicians</td>
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<tr>
<td>- Annual budget &gt;25 million</td>
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<td>- 1500 new cases/year</td>
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<td>- Adequate volume of research as assessed by the Audit team based on qualitative and quantitative criteria</td>
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Did you need a lot of money for a cancer mission?

- **NO**
  - For a small management team of a network of networks:
    - A maximum of 500,000 euros per year just to write clear calls on various subjects and organize the visibility of various steps of actions.

- **YES**
  - For application on various subjects:
    - Prevention 35%
    - Basic research 20%
    - Early diagnosis and Screening 20%
    - Translational research 15%
    - Outcome research 10%

- **YES**
  - For more money in eastern countries and some south countries:
    - To come back to the level of western countries.

**Quality Measurement 10%**
How to choose the conductor of the orchestra?

The conductor should not be a player of one instrument of the orchestra. Should not apply for money himself.

Hypothesis 1
ECCO

Hypothesis 2
Patients associations with a good team of people who will not apply for money.
Can we set up a cancer mission without National cancer institutes and close relationship with National cancer plans?

- Obviously not
- National organisation in France (INCa) is an example
- Cancer plan: 24 member states had a document summarizing cancer fight in 2016 (Austria and Luxembourg had developed Plan in 2017 and Island integrated cancer as a priority of her health plan. Only Bulgaria and Slovenia had no documents.

A ROLE FOR IARC?

Prevention could reduce by 40% the number of cases
The need for cancer prevention: facing the projected health burden

EU (28)
All cancers excl. non-melanoma skin cancer

0 1 2 3 4
0 1 2 3

Incidence
Mortality

24.4% increase
37.3% increase

Assuming no change in underlying incidence

GLOBOCAN 2018
ESTIMATED CANCER INCIDENCE, MORTALITY AND PREVALENCE WORLDWIDE IN 2018
The need for cancer prevention: facing the economic burden

No country can afford to treat its way out of the cancer problem

• Economic burden in the 27 EU countries in 2009\(^1\):
  – €126 billion in total
  – Health care €51 billion; Productivity losses and lost working days €52 billion; Informal care €23 billion

Cancer prevention: the potential for primary prevention in Europe

### 75-100% preventable
- **Cervix uteri**: 100% preventable (58,000)
- **Lung**: 90% preventable (410,222)
- **Oral Cavity (lips)**: 90% preventable (61,000)
- **Oesophagus**: 90% preventable (46,000)
- **Melanoma**: 75% preventable (100,000)
- **Stomach**: 75% preventable (140,000)

### 25-74% preventable
- **Colorectum**: 55% preventable (447,000)
- **Bladder**: 40% preventable (151,000)
- **Kidney**: 40% preventable (115,000)
- **Liver**: 40% preventable (63,000)
- **Uterus**: 35% preventable (99,000)
- **Pancreas**: 35% preventable (104,000)
- **Breast**: 25% preventable (45,900)

### Less than 25% preventable
- **Ovary**: 20% preventable (66,000)
- **Leukaemia**: 15% preventable (82,000)
- **NHL**: 5% preventable (94,000)
- **Prostate**: 0% preventable (40,000)
- **Brain**: 0% preventable (57,000)
4th Edition European Code Against Cancer

Avoidable fraction of cancers: six major risk factors

39% preventable

smoking, alcohol, diet, BMI, physical inactivity, UV

48% preventable
Cancer Prevention Europe: consortium members

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<th>CORE MEMBERS</th>
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<tr>
<td>IARC (Secretariat)</td>
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<tr>
<td>Danish Cancer Society</td>
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<tr>
<td>Karolinska Institute</td>
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<tr>
<td>University of Stirling &amp; CRUK</td>
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<tr>
<td>Imperial College</td>
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<tr>
<td>UK Translational Cancer Prevention Network</td>
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<tr>
<td>German Cancer Research Center</td>
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<tr>
<td>European Institute of Oncology</td>
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<tr>
<td>Wageningen University &amp; WCRF</td>
</tr>
<tr>
<td>*The Maria Skłodowska Curie Memorial Cancer Centre and Institute of Oncology</td>
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Consortium Agreement has now been signed, including annual financial commitment

OPEN TO NEW PARTNERS!  OECDI, LYON and Curie CCC candidates

* Observer to consortium
INTEGRATING GENOMICS IN A PUTATIVE MISSION

- **Genomics in Prevention**: we need research on personalized preventive measure and still on Breast and Colon cancer.
- **Genomics in Early diagnosis and Screening** with Blood circulating malignant cells
- **Genomics in fundamental and translational research**
- **Genomics in personalized medicine in real life** ie outcome research
- **Genomics and Immune response should be also in fundamental and translational research**

**DO NOT FORGET PEDIATRIC**