The Carnot Institutes
R&I PARTNERS for INDUSTRY and RTOs
The Carnot Institutes Network

1. Carnot?
2. Research & Innovation for Industry and RTOs
3. GLOBAL CARE Initiative (Healthcare)
4. CALYM, an Example of French-Australian Cooperation
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Nicolas Leonard Sadi Carnot (1796 – 1832)
Engineer, Ecole Polytechnique, Paris
Reflections on the motive power of heat and on the machines that develop this power.
“No engine operating between two heat reservoirs can be more efficient than a Carnot engine operating between the same reservoirs”
2nd Law of Thermodynamics
Industry-driven academic research generating landmark marketable innovations
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Develop research partnerships with industry and other research & technology organizations to bring answers to their unmet innovation needs that will have a positive societal and/or economic impact.
Carnot Institutes

- An organization set up by the French Ministry of Higher Education and Research in 2006
- French public research labs or consortia selected for funding through a competitive call for applications
- Common features
  - Scientific excellence
  - Proven, high-level history of research partnering
  - Professionalism
Guiding principles

- Financial support from the French National Research Agency based on measurable results from previous year

- A detailed, yearly action plan and budget, with ambitious commitments regarding
  - Partnering research
  - Professionalization
  - Basic research refueling

- The Carnot Code of Ethics and Standards (incl. IP protection)

- A structured network for increased efficiency and impact, with collective actions coordinated by the Carnot Institutes Association

> Funding: 20% of audited partnering research income from year -1 (30% if with SMEs)
> Budget: 57 € M / year
> Additional incentive: tax credit x 2 for public research teams
The Strength of a Unique R&I Network

34 Carnot Institutes

Basic and Applied Research

- Engineering and Manufacturing Industries
- Automobiles
- Fashion & Luxury
- Environment
- Energy
- Transportation
- Consumer Goods
- Pharmacy
- MedTech
- Chemistry & Materials
- Nutrition & Bio-Sourced Materials

And the governing bodies: universities, CNRS, INSERM, hospitals…

Collaborations with the other members of the ecosystem: competitiveness clusters, thematic research institutes, tech transfer organizations…
A Key Stakeholder of France’s Industrial Competitiveness and Economic Growth

2014 data

- 55% (EUR 458m) of all of France’s public contract R&D with industry
- EUR 2.2bn consolidated budget
- 15% (27,000 FTEs, incl. 8,000 PhD students) of the French State’s research staff
- 20,000 peer-reviewed articles
- 1,050 prioritary patents
- 65 start-ups created

Continuous dynamic growth

- + 52% contractual R&D turnover growth in 4 years (2010-2014)
Performance Comparable to Fraunhofer’s

Contract research income from companies (EUR m)

1 € = 1.48 AUS $

1949: creation of Fraunhofer Institutes * Creation of Carnot Institutes (1st call for applications) ** New call for Carnot Institutes applications
Partnering with Carnot Institutes

- Contract research
- Collaborative projects
- Joint laboratories
- Advice and expertise
- Access to platforms

*International development: new opportunities for collaborations*
Joint Laboratories
R&D Cooperaations

NIST / CSTB
SANDIA / IFPEN TES
CSNE / CEA-Leti
UT Dallas
LAAS CNRS

Canada / I@L, LISA

Mexique / I@L

EMBRA / QUALIMENT

Sénégal / CEA

China / I@L, Inria

Japon / I@L, LAAS CNRS

Taiwan / LAAS CNRS

SP / CSTB

Joint laboratories (UMI, LIA)

Research cooperation, Research alliances, …
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A CONCENTRATE OF FRANCE’S RESEARCH AND INNOVATION IN LIFESCIENCES

• A consortium of 5 Carnot Institutes created in 2012
• International leaders in human health
• Addressing major unmet medical needs and top-tier markets

The Global Partnership Research Initiative of the Carnot Human Health Institutes

→ French State funding for mutualized international R&D and business development activities
FOSTERING UNIQUE PARTNERSHIPS WITH INDUSTRY AND OTHER RTOs

**Research & Innovation**
- 2,500 researchers
- 15 Nobel Prizes
- 5,000 active patents

**Discovery/Preclinical**
- Drug screening
- Numerous models
- State-of-the-art platforms

**Precision Medicine**
- Phase I to IV clinical research
- Unique databases/collections
- Strong bioinformatics capacity

**Partnering**
- Industry standards (QA, IP)
- Incubators, spin-off companies
- Operational team (incl. Boston)
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Lymphoma

- 1st blood cancer
- A 10 Bd USD market (pharmaceuticals)

**CALYM**: 13 research entities with lymphoma as their common focus

- **LYSA***, a world-renowned cooperative group
- **LYSARC****, Europe’s leading academic research organization in lymphoma
- 11 public high profile research labs

Effector & memory B cell - Therapeutic immunotargeting of B-cell tumors - Immunology & oncogenesis of lymphoid tumors - Indolent B-cell proliferations - Normal and pathologic haematopoiesis - Study group of lymphoid proliferations - Microenvironment & cancer - Molecular genetics in haematopoietic tumors - Immunology & cancer - Genomic instability and human hemopathies - Cytokine receptor and signaling

* The Lymphoma Study Association
** The Lymphoma Academic Research Organisation

www.calym.org
An Example of French-Australian Cooperation

3 partners Collaborating since 20 years in the field of lymphoma clinical research
- LYSA & LYSARC (CALYM)
- ALLG, the Australasian Leukemia & Lymphoma Group (HQ in Melbourne, network of experts and hospitals, with research projects)

ALLG invited to participate in LYSA-LYSARC international clinical trials funded by pharma companies

Hundreds of Australian lymphoma patients have benefited from innovative treatments thanks to these trials

NSW hospitals and Spark Interact have developed ClinTrial Refer, an App to increase patients enrolment

Yesterday CALYM in-licensed the App for use in the LYSA-LYSARC international trials!