



**Karolinska  
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# **New alliances, new partnerships, new networks**

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## Conclusions from epidemiological analyses

- **Cancer incidence will increase with about 60% within the next two decades**
- **The number of deaths caused by cancer will also increase about 60%**
- **Patients living with a cancer disease will increase still more**
- **Thus, present preventive, health care and research strategies are not able to balance an increasing cancer problem**

# How to counteract the increasing cancer problem?

**Cancer medicine should be:**

**Predictive**

**Personalized**

**Preemptive**

**Participative**

**(P4-medicine)**

**We need new strategies for prevention, early detection and therapeutics**

# Personalized cancer medicine - treatment

- Treatment at an early stage of the disease
- Personalized cancer medicine based on biology of the tumour and normal tissues
- “The right treatment to the right patient at the right time”
- Advanced research on identification and validation of biomarkers (biomics, bioinformatics, systems biology, prospective validation) and molecular pathways driven clinical trials

# Personalized cancer medicine – early detection

- Premalignant lesions
- Early invasive disease
- Early metastatic disease
  
- Discovery and validation of biomarkers in tumours, body fluids, circulating tumour cells, peripheral blood cells

# Personalized cancer medicine - prevention

- **Prevention of high risk individuals - stratification of prevention**
- **Molecular genetics**
- **Exposome – exposures and adaptive responses and effects of exposures (“two ways translational research”, Chris Wild)**

## Present barriers in European cancer research

- **The large number of subgroups of tumours**
- **The cancer research continuum is fragmented**
- **Lack of critical mass: patients, biological materials, technological resources and competences**

**EUROCAN-Plus project**

## A key message from the EUROCAN-Plus project

- **Collaboration between individual research groups is no longer the solution**
- **Collaboration between Comprehensive Cancer Centres and basic/preclinical cancer research centres is mandatory to guarantee the infrastructure support, critical mass of expertise and resources, as well as to improve coordination**

## Translational cancer research – integration of the cancer research continuum

- **Early translational cancer research – bridging basic/preclinical research and clinical research**
- **Late translational cancer research - bridging clinical research and implementation/evaluation of innovations in the health care systems (a prerequisite for adoption)**
- **Outcomes research is an obligatory part of the translational cancer research**



# Personalized cancer medicine – research continuum

(Molecular Oncology Vol 6, No 2, april, 2012)

- **Cancer biology**
- **Target discovery and validation**
- **Drug development**
- **Treatment predictive biomarker discovery and validation**
- **Bioinformatics and systems biology**
- **Molecular pathology**
- **Molecular imaging**
- **Molecular pathways driven clinical trials**
- **Pharmacogenetics – side effects**
- **Outcomes research and health economy**
- **Personalized cancer medicine is cost-effective!**

## Late translational cancer research – an unmet need

- **Clinical effectiveness of specific treatments**
- **A complete outcomes research for evaluation of innovations**
- **Health economy – cost-effectiveness**

### Consequences:

- **Increased availability of effective treatments for patients**
- **Decreased availability of less good treatments for patients**
- **Cost-effectiveness to prioritize in the health care**

**Comprehensive clinical registries are required**

# Collaboration between centres – harmonized infrastructures are required

## Molecular pathways driven clinical trials

- Omics technologies – screening of patients
- Bioinformatics/systems biology – combinations of targeted drugs
- Molecular pathology (spatial resolution), molecular imaging
- Clinical data bases, biobanks
- Biomarker discovery and retrospective validation
- Linkage to preclinical research – tumour cell heterogeneity, inherent and acquired drug resistance
- Clinical effectiveness and health economy

## **Industry – academia – health care systems: collaboration is suboptimal**

- **Industry is increasingly dependent on academic research centres for:**
  - Target discovery and drug development**
  - Biomarker discovery and validation**
  - Molecular pathways driven clinical trials**
- **Clinical effectiveness, outcomes research and health economy – involvement of health care systems, payers**
- **Collaboration between companies is an unmet need – present iteration of activities should be avoided**

# Collaboration with patient organisations

- **Availability of patients for clinical trials is an increasing problem when approaching personalized medicine**
- **Availability of new diagnostic methods and treatments for patients a problem**
- **International collaboration must be extended**
- **Regulatory issues regarding international sharing of clinical data and biological materials – support from patient organisations is important**

## National networks of cancer research centres

- **France – INCA: 16 early clinical trial centres and 28 technical platforms for stratification of patients**
- **UK – network of cancer research centres**
- **Germany – a consortium of centres for translational cancer research**

# **EurocanPlatform – a consortium for translational cancer research**

- **Improve translational cancer research by linking Comprehensive Cancer Centres and basic/preclinical cancer research centers**
- **Overcome the problem with lack of critical mass: patients, biological materials, technological resources and competences**
- **A structure for research covering the cancer research continuum from cancer biology to adoption of innovations in the cancer care**
- **A comprehensive strategy for development of personalized cancer medicine**

# Centres behind the Stockholm Declaration – founder centres

- **CNIO, Madrid**
- **NKI, Amsterdam**
- **Norwegian Radiumhospital..**
- **Cambridge Research Inst...**
- **Danish Cancer Society**
- **Inst Jules Bordet**
- **Erasmus... Rotterdam**
- **Manchester Cancer Res...**
- **EIO, Milan**
- **Istituto Nazionale... Milan**
- **Institute Curie, Paris**
- **IGR, Villejuif**
- **DKFZ, Heidelberg**
- **NIO, Budapest**
- **Oxford University**
- **IARC, Lyon**
- **EMBL, Heidelberg**
- **Karolinska Inst, Stockholm**

## Additional participants

- **ICR, Royal Marsden**
- **Leiden Univ Med center**
- **FIVO, Valencia**
- **Istituto tumori Bari**
- **De Vall Hebron,  
Barcelona**
- **eCancer.eu**
- **ECCO**
- **OEI**
- **ECPC**
- **EORTC**

# Summary of structural changes for development of personalized cancer medicine

- **Collaboration between cancer research centres to guarantee the infrastructure and critical mass**
- **Research funding should support translational cancer research and international collaboration**
- **Collaboration between academia and industry is necessary to increase effectiveness and decrease costs – public/private partnership**

## Structural changes... cont.

- **Involvement of health care systems in clinical research, including late translational cancer research for outcomes research and health economy**
- **Expand the roles of patient organisations – availability of patients for research, regulatory issues**
- **Vision and strategies should be shared between academia, health care systems, industry and patient organisations**

# European activities supporting development of personalized cancer medicine

- **EU – FP8: Horizon 2020 – Innovation Union – personalized medicine**
- **EurocanPlatform**
- **ENCA – network for pediatric oncology**
- **TRANSCAN – network of funders to support international translational cancer research**
- **European Academy of Cancer Sciences**
- **European Partnership on Actions Against Cancer (EPAAC)**
- **European Council for Health Research**
- **European Alliance for Personalised Medicine (EAPM)**