



Oncopolicy Forum

**Oncopolicy 2020
Report**

**An ECCO initiative because every
cancer patient deserves the best**

Track Report from the European Cancer Congress 2013



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Oncopolicy 2020: taking things to the next level

Executive summary

How to best translate scientific advances into improved patient outcomes is one of today's key questions in oncology. The challenge is broad, compounded by a shift in the medical paradigm towards personalised medicine and by the complexity of healthcare and its community of stakeholders. ECCO exists to integrate the expertise and insights of the various stakeholders within the oncology community to achieve the best possible patient outcomes, taking into consideration the trends that impact on cancer, the complexity of the disease and the specificity of each cancer patient.

The Oncopolicy Forum sought to address current policy issues surrounding oncology and to identify opportunities for collaborative initiatives amongst the oncology community for the years to come. Topics tackled included research, personalised medicine and care, organisation of specialised care, and translation of evidence into policy.

Cancer research has an important role to play in enabling improved patient outcomes, and well organised and structured dialogue between stakeholders is essential in order to define effective strategies in this area. Long-term, strategic planning is needed as well as increased investment in research to drive breakthrough discoveries. The latest knowledge in biology should inspire new models of clinical research and new ways of evaluating the cancer drugs of tomorrow, and structures are needed for collecting information for clinical effectiveness studies and outcomes research.

The new EU Framework Programme for Research and Innovation, Horizon 2020, is set to provide new opportunities for cancer research in Europe. The programme takes a challenge-driven approach and has been shaped with the guidance of ECCO and the wider biomedical research community. New to the programme is the creation of a Scientific Panel for Health, a science-led stakeholder platform that will elaborate scientific input, provide a coherent scientific-focused analysis of research and innovation bottlenecks and opportunities, contribute to the definition of research and innovation priorities, encourage EU-wide participation in the programme and help to build capabilities and foster knowledge-sharing and stronger collaboration across the Union.

Genomics represents a major opportunity for individualising patient treatment and care, and pioneering programmes are being rolled out in various countries, providing lessons for initiatives in personalised medicine across Europe. The UK's Stratified Medicines Programme, which was designed to demonstrate various principles in the delivery of stratified medicine through the establishment of a platform of centres across the country, has shown high acceptability amongst patients, but highlighted the need for routine consent for research using tissue and data. Furthermore, the delivery of stratified medicine depends on the establishment of standards for sample handling, preparation and processing, planning for technology hub workflow and continuing to use manual data extraction until automated data extraction becomes more reliable. The Centre for Personalised Cancer Treatment (CPCT), a Dutch collaborative initiative between cancer centres funded by governmental and non-governmental organisations, is a bottom-up initiative covering three programmes: Phase I, Standard of Care and Discovery. The initiative has highlighted the importance of attaining funds for such programmes and how the involvement of philanthropic organisations can be instrumental. In France, the National Cancer Control Programme (2009–2013) provides for top-down patient or tumour-centred initiatives related to personalised care and medicine. Success factors for personalised cancer care in France include an integrated approach, equity of care and institutional steering.

While we are on the cusp of an era where patients will be characterised and genetic changes identified, real progress will only be made towards this goal if the collection and analysis of genomic information in large patient cohorts is realised. A significant opportunity for Europe lies in the creation of a dynamic and sustainable '1 million patient knowledge bank', which will require the harnessing and coordination of data across Europe, implying open coordination between national programmes, early involvement of patient advocacy groups, legal and policy advisers and database engineers, engagement with the pharmaceutical industry, sustainable funding models and importantly a European vision on how data can be brought together.

In terms of access to highly specialised healthcare for cancer patients suffering from rare diseases, the EU Directive on Cross-Border Healthcare provides for the creation of European Reference Networks to help professionals and centres of expertise in different countries to share knowledge. It will be important that funding and sustainability of the networks are addressed, and in this regard public-private partnerships could be explored in the future.

Initiatives to improve patient outcomes must be underpinned by sound science, and the European Academy of Cancer Sciences contributes to strategies in areas where evidence is lacking or where absence of consensus on the evidence leads to roadblocks in cancer control. Indeed there is a continuum of problems all the way from carcinogenesis to early detection and screening through to various treatment modalities and outcome assessment and survivorship issues. It is important to acknowledge that if the whole problem is not tackled in its entirety, gaps in development plans will be exposed and will be the bottlenecks in overall improvement of the system. Importantly, costs and benefits must be assessed at each stage.

Concluding the Oncopolicy Forum, several key areas were deemed of high relevance for collaborative efforts amongst the oncology community in the coming years. A long-term strategy for cancer research, shaped by academics, oncology professionals and patients, is needed, especially in light of the upcoming work of the Scientific Panel for Health. The value of an independent body of excellence such as the European Academy of Cancer Sciences is evident in this regard, as well as in providing evidence-based support for policymaking in Europe across the whole cancer continuum.

Collaboration is considered essential not only between academics, professionals and patients, but also with industry, nurses and other actors who can help generate evidence to improve patient outcomes. Definitions and values must be commonly agreed in order to optimally communicate and implement personalised medicine, and new structures are needed to pool knowledge across Europe, in particular for data sequencing.

Consensus on the principles underpinning multidisciplinary and its subsequent translation in practice is crucial. Furthermore, collaboration between national cancer registries, such as through the EURECCA project, will be a driver in identifying outcome patterns in relation to different treatments, thereby enhancing multidisciplinary and harmonised care.

Recommendations derived from the present Oncopolicy Forum will be the drivers for future ECCO initiatives, and will be revisited at the next edition of the event, due to take place at the European Cancer Congress in Vienna in 2015.

Welcome Letter

*Tonio Borg,
Commissioner for Health*



I was honoured to participate in the Oncopolicy Forum 2013.

Cancer continues to present a huge challenge for citizens, and for health policy and health services across the European Union. It is estimated that 1 in 3 men and 1 in 4 women in the European Union will be directly affected by cancer before reaching 75 years of age.

The Commission is committed to supporting Member States in the field of cancer. In pursuit of this objective, the European Partnership for Action against Cancer was launched by the Commission in 2009, and a Joint Action with Member States was created in this context, to foster the sharing of information, capacity and expertise in cancer prevention and control.

The co-ordination of activities at EU level has helped to avoid scattered actions and the duplication of efforts, and has supported Member States in the development of their national cancer strategies, the implementation of screening programmes and the updating of prevention tools such as the European Code against Cancer.

Looking further ahead, in 2014 the Commission will launch a new Joint Action on Comprehensive Cancer Control, to identify key elements and quality standards for cancer control in Europe, and to facilitate co-operation among Member States, on how to ensure optimal and comprehensive cancer care.

Our action does not stop here. The Commission will update, in close cooperation with its Joint Research Centre, the screening and quality assurance guidelines for breast cancer. The new guidelines – scheduled to be published in 2015 – will help Member States develop and modernise their strategies on breast cancer screening and management, in the best interest of millions of women across the EU.

The European Commission's Joint Research Centre is also setting up a new Cancer Information System, to bring together cancer registries from across Europe. Harmonized data is fundamental towards enabling better monitoring of the direct effects and benefits of cancer policy interventions.

For over 25 years, the European Commission has contributed towards addressing the cancer challenge. Our goals remain to prevent cancer where we can and to improve the prospects of cancer patients obtaining appropriate and timely diagnosis, information and care. Cancer is, and must remain, a high priority at all levels.

Letter from the President

*By Professor Cornelis van de Velde
ECCO President 2012 - 2013*



The fifth edition of ECCO's Oncopolicy Forum took up the challenge of paving the way for a coherent and effective framework for oncopolicy, over a one and a half day track during the European Cancer Congress 2013 in Amsterdam.

ECCO brought together members of the oncology community and policymakers to discuss how to navigate the complex challenges of cancer research, treatment and care and agree on collaborative endeavours for the future.

Through six interactive and lively sessions, the Oncopolicy Forum looked to the future, inspiring cancer policy debate amongst a multi-stakeholder audience in view of 'Oncopolicy 2020'. The programme, directed by Track Chairs Prof. Julio Celis and Prof. Razvan Popescu, is an initiative of ECCO's Policy Committee, and covered a wide range of topics from the new EU Research Framework Programme, "Horizon 2020", to European Reference Networks, to personalised medicine and the prioritisation of scarce resources in oncology. Carefully balanced panels were put together to reflect as wide a range of views as possible, including the patient perspective in each and every discussion, mirroring ECCO's philosophy that every cancer patient deserves the best.

As part of ECCO's focus on optimising the cancer network to improve outcomes, ECCO is committed to facilitating collaborative partnerships and is proud to take a leading role in several multidisciplinary, multi-stakeholder initiatives at EU-level, such as the European Partnership for Action Against Cancer, the Alliance for Biomedical Research in Europe and the European Chronic Disease Alliance. The recommendations derived from this year's Oncopolicy Forum for further collaboration, both to improve integrated, multidisciplinary cancer control and to shape policy initiatives for its facilitation, will be the drivers for future ECCO initiatives, and I look forward to continuing these discussions at the next Oncopolicy Forum, due to take place at the European Cancer Congress 2015. We do hope you will join us in the wonderful city of Vienna for this event.

Session One: ECCO and European cancer policy - Shaping the future through solid science and strategic partnerships



Chair: Alexander M.M. Eggermont

Introductory remarks

Alexander M.M. Eggermont

Former ECCO President and President of the European Academy of Cancer Sciences

Alexander M.M. Eggermont welcomed participants to the Oncopolicy Forum, part of the European Cancer Congress, introducing ECCO as a federation of professional societies, cancer leagues, research organisations and patient platforms, all of whom have a mission in and around cancer. An umbrella organisation of 24 member societies representing around 60,000 professionals in oncology, ECCO aims to take a helicopter view on cancer issues and to be a catalyst in integrating the knowledge and competence rooted in the constituent organisations.

One of the major challenges in oncology is how to translate scientific advances into improved patient outcomes. The complexity of healthcare is such that it is not sufficient to envisage a trajectory from science to cancer care - rather, improved care depends on a multitude of elements encompassing science, medical professional issues, payer concerns and patient perspectives. Many patients who die of cancer die far too soon, and many deaths would be preventable if we knew how to better structure and integrate care. ECCO exists to integrate the expertise and insights of the various stakeholders within the oncology community to achieve the best possible patient outcomes, taking into consideration the trends that impact on cancer, the complexity of the disease, and the specificity of each cancer patient.

Whereas multidisciplinary has traditionally implied a process of bringing the various professions together to manage the cancer patient, the societal challenge of cancer means that an integrative approach now goes far beyond this and implies taking into account the patient's role, the patient's family's role, the societal role and the policy role.

Personalised medicine is particularly relevant in the field of cancer and the issues involved in realising it illustrate the need for a multi-stakeholder, integrated approach. Rapidly translating discoveries into clinical practice and ensuring equal access to medicines and care, and both of these in times of austerity, are major challenges for the cancer community.

Overview of EU action in the field of cancer policy



Tonio Borg

EU Commissioner for Health

Tonio Borg, EU Commissioner for Health, introduced the European Union's role in tackling cancer, an important role despite the principle of subsidiarity that underlies health policy in Europe. With 2.6 million citizens diagnosed with cancer in 2012, and 1.3 million dying of the disease in the same year, the EU has a multi-faceted strategy for this major health scourge.

In particular, the Commissioner highlighted the work being carried out through EPAAC, and the orientations of the new Joint Action, CANCON, as well as the activities of the JRC in the field of cancer screening and in the creation of a European Cancer Information System.

Furthermore, in order to improve the overall governance of the EU's work on cancer, the creation of a European Union expert group on cancer control is being considered. The expert group, which would be constituted of Member States representatives, health professionals and patient organisations, would ensure that a sharp focus is kept on priorities, that actions are effectively coordinated and duplication of efforts is avoided.

Introduction to the next EU research framework programme, Horizon 2020

Maria-Jose Vidal-Ragout,

Head of Unit, Medical Research, DG Research and Innovation, European Commission

The new EU research framework programme, Horizon 2020 (H2020), has a budget of €70.4 billion, a major increase on the FP7 budget. For the first time, H2020 brings together all research and innovation activities in a single programme through three distinct but mutually reinforcing pillars: Excellent Science, Industrial Leadership and Societal Challenges. Opportunities for cancer will be substantial both in the Excellent Science pillar as well as the Societal Challenges pillar. Within the latter, the Health, Demographic Change and Wellbeing strand will take a challenge-driven approach, fostering integration across diseases and disciplines and covering the full innovation chain from basic research to deployment of products, interventions and services. It will seek to mobilise information technologies' potential for the benefit of health research and care and will foster the integration of research efforts into comprehensive public health policy addressing Europe's needs, boosting the development of medicines and vaccines, and contributing to improving global health.

The Health, Demographic Change and Wellbeing challenge of H2020 will consist of six principal priorities:

- **Understanding health, well-being and disease**
- **Preventing disease**
- **Treating and managing disease**
- **Active ageing and self-management of health**
- **Methods and data**
- **Healthcare provision and integrated care**

Furthermore, H2020 will support five public-private partnerships including the Innovative Medicines Initiative 2 (IMI2) in which cancer will be specifically addressed.

ECCO's leading role in shaping EU cancer policy



Julio E Celis

ECCO Board Member and Policy Committee Chair

Julio E Celis gave an overview of ECCO's Oncopolicy activities, which revolve around research and multidisciplinary care and which aim to contribute to multidisciplinary, evidence-based policymaking in the field. Oncopolicy activities are led by the ECCO Policy Committee, and integrate input from the European Academy of Cancer Sciences (EACS), an independent think tank that provides impartial, authoritative and evidence-based advice to underpin policy, and the ECCO Patient Advisory Committee.

The Oncopolicy Forum is a setting where all relevant stakeholders including researchers, health care providers, policy makers, industry and patient advocates can discuss and propose consensual solutions to issues that are of high importance to the oncology community.

Over the past three years ECCO has led the research coordination work package (WP8) of the European Partnership for Action Against Cancer (EPAAC) and together with the French National Cancer Institute (INCa), the Istituto Superiore di Sanita (ISS) in Italy, and the Spanish Instituto de Salud Carlos III (ISCIII) and Centro Superior de Investigacion en Salud Publica (CSISP) to identify and prioritize areas in cancer research that will benefit from coordination, develop a coordination approach ensuring that national decisions are based on a joint EU-wide understanding in order to avoid duplication of efforts, and implement pilot research coordination projects in selected areas.

ECCO is a founding member of the Alliance for Biomedical Research in Europe (Biomed Alliance) which, over the past several years, has focused its efforts on promoting long-term, strategic planning of health research at European level. Current challenges in health research in Europe include a growing prevalence of chronic diseases, a declining labour force, rising healthcare costs, a fragmented community of innovators and inadequate research coordination at national, regional and European level. There is agreement amongst health research societies that these challenges can only be met by increased knowledge throughout the research continuum from bench to implementation and by developing a scientific-led European health research strategy.

Through extensive consultation and discussion amongst the health research community and policy makers, the Biomed Alliance worked towards the creation of a strategic plan for health research that culminated in H2020 with the establishment of the Scientific Panel for Health research, a science-led stakeholder platform within the H2020 programme that would elaborate scientific input, provide a coherent scientific-focused analysis of research and innovation bottlenecks and opportunities, contribute to the definition of research and innovation priorities, encourage EU-wide participation in the programme and help to build capabilities and foster knowledge-sharing and stronger collaboration across the Union. ECCO is currently working with other members of the Biomed Alliance to ensure a timely and effective implementation of the Scientific Panel for Health in H2020.

Furthermore, ECCO is continuing systematic and proactive efforts to support collaboration and coordination in cancer research in Europe and to promote closer collaboration with funders, policymakers, regulators, industry and other relevant stakeholders for the benefit of the patient.

In the long-term, ECCO anticipates promoting the evolution of long-term, strategic planning of cancer research in Europe at a larger scale, and in collaboration with the EurocanPlatform Network of Excellence to move towards the creation of a virtual cancer centre for Europe which could pave the way towards a European Institute for Health.

Reconciling the needs of the scientific community with a complex EU policy environment

Jose Mariano Gago

Former Minister for Science, Technology and Higher Education, Portugal

Jose Mariano Gago gave his personal perspectives on the history and evolution of science policy in Europe. The social and political fabric that brings together scientific and political actors varies between countries. Not only has EU action in the field of science policy had to navigate these differences, it also builds on a previous European network of relationships between political and science actors established through intergovernmental organisations such as the European Space Agency, CERN and EMBL. Science policy at the European level has seen varying degrees of success, depending on the sector, although its contribution to positive countercyclical national scientific policies since 2008 has unfortunately achieved very limited results.

In recent years, the biomedical community has seen one of the most interesting periods of transformation, with scientific advances changing the relationships between scientists, practitioners, regulators and industry, and a growing presence and role for patient groups. Spurred by this changing medical paradigm, ECCO, through the Biomed Alliance, has been proactively contributing to the future of science policy in Europe. Its recently adopted proposal for a Scientific Panel for Health is expected to facilitate strategic, long-term scientific steering and planning of health research programmes in Europe. This initiative should have a structural effect in contributing to defining biomedical research and translation programmes based on the best scientific leadership and should ensure expert scientific input on policy from the outset.

Views of the European Parliament

Teresa Riera Madurell MEP,

Rapporteur Horizon 2020

As the European Parliament Rapporteur for H2020, Teresa Riera Madurell explained her role in the negotiations. Firmly believing that political and financial commitment to cancer research, treatment and care is essential even in times of austerity, Teresa Madurell worked to ensure that cancer and biomedical research receive the attention they deserve in the programme. Indeed, the European Parliament has safeguarded biomedical research in each of the three pillars of H2020.

Teresa Madurell has been a champion of the Scientific Panel for Health concept and thanked ECCO and the Biomed Alliance for providing expertise and advice throughout the legislative process. She concluded by reiterating that permanent channels of communication between decision-makers and the scientific community are vital, and that the oncology community must continue its engagement with policymakers during the implementation of the research programme to ensure that the right priorities are in place.

Panel discussion 'A multi-stakeholder approach to shaping Horizon 2020 and Europe's societal challenges'



Moderated by Gordon McVie,
European Institute of Oncology

Panellists:

Agnes Buzyn, Chairwoman and CEO of the Institut National du Cancer
Jola Gore-Booth, Member of the ECCO Patient Advisory Committee
Alexander M.M. Eggermont, President of the European Academy of Cancer Sciences
Ulf Smith, President of the Alliance for Biomedical Research in Europe
Richard Bergstrom, Director General of the European Federation of Pharmaceutical Industries and Associations.

The multi-stakeholder panel identified various issues pertaining to cancer research and care which are often overlooked but which require a policy response: diet and lifestyle, early detection, survivorship, palliative care, ageism in cancer care, and social deprivation.

Furthermore, various major issues in cancer research which require a dialogue between stakeholders in order to put together effective strategies were dealt with.

The importance of research being guided by long-term, strategic planning, was stressed, also in light of addressing co-morbidities. Since many diseases have similar risk factors, occur together, or provide clues to other conditions, multifactorial and multidisciplinary collaboration is required in order to address the major societal health challenges. Since H2020 will not have a disease-specific focus but will rather take a challenge-driven approach, ECCO and the biomedical research community anticipate that the Scientific Panel for Health will be the driver for the long-term, strategic planning that is so desperately needed.

Research brings breakthrough discoveries, and as such, increased investment in research is needed in order to find treatments which may be more effective than, and eventually replace, the marginally effective drugs we are using today. Drug development models need to be adapted to the current level of science, and the blockbuster/marginal efficacy model may no longer be suitable. Furthermore, the cost of developing cancer drugs has become unsustainable for society and the knowledge we have on the biology of cancer should inspire new models of clinical research and new ways of evaluating the cancer drugs of tomorrow. What is more, there is no system for monitoring drug efficacy post market authorisation, and structures are needed for collecting information for clinical effectiveness studies and outcomes research. Without such information, which will demonstrate which benefits are being derived and at what cost, personalised cancer medicine may never be realised. HTA agencies and payers need to be involved early on in drug development, and a European approach to assessing relative effectiveness could be useful. One major difficulty in obtaining reliable outcome data is the lack of detailed information being fed into registries. Electronic dossiers may alleviate this problem to a certain extent, although data will still need to be entered patient by patient. There are only a few cancer centres in Europe which currently have the systems in place to understand outcomes research and outside of these the system is not yet ready for it. Regarding registry data, it is important that quality of life aspects are included since clinical trials rely too heavily on overall survival. An overarching issue that needs to be addressed in cancer research is data sharing, which is currently a major problem. Open access to data will be key to unlocking discoveries in the future.

To conclude the session, it was agreed that ECCO has a key role to play in transcending the individual interests of cancer stakeholders and in stimulating multi-stakeholder discussions to facilitate the coordination of cancer policy at European level.

Session Two: Horizon 2020 - EU Funding opportunities for you and your team

Horizon 2020: A streamlined approach for new and improved health research in Europe

Chair: Julio Celis

Maria-Jose Vidal-Ragout,
Head of Unit Medical Research, DG Research and Innovation, European Commission

The EU has provided 1.4 billion euros for cancer research through its framework programme for research and innovation. FP7 funding has supported research into metastasis, tumour microenvironment, biomarkers, resistance and models to overcome resistance. For the first time, FP7 supported investigator-driven trials and palliative/end of life research.

Expanding on her previous presentation, Maria-Jose Vidal-Ragout gave practical advice for those wishing to apply for funding under H2020.

H2020 will take an innovative approach and will combine the framework programme activities with innovation-related activities of the former Competitiveness and Innovation programme and the European Institute of Innovation and Technology.

Strong SME participation in the programme is encouraged. Indeed the programme is inspired by the Small Business Innovation Research (SBIR) model in the US, and is challenge-driven and bottom-up. Participation in collaborative research projects depends on the participation of at least 3 legal entities of EU Member States or Associated Countries.

Key innovative elements of Horizon 2020 include the following:

- **A simplified funding model (up to 100% of eligible costs are covered)**
- **A shorter time to grant (capped at 8 months)**
- **A single entry-point for applicants**
- **New forms of funding aimed at innovation (pre-commercial procurement, inducement prizes, dedicated loans and equity instruments)**

Session Three: Personalised cancer medicine - Spotlight on pioneering national programmes

Chairs: Carlos Caldas and Peter Campbell



Introductory remarks

Carlos Caldas,
Professor of Cancer Medicine, Cancer Research UK Cambridge Research Institute

Carlos Caldas introduced the session with the question of how to bring molecular diagnostics to the fore. Nowadays personalised cancer medicine means individualising cancer patients' care based on a holistic approach and including a deep characterisation of the tumour. Genomics can be used not only for stratification but for functional imaging and for tracking the response to therapy of tumours. When providing for personalised cancer medicine, the following four aspects need to be considered: provision, assay validity, clinical validity and clinical utility.

Innovative approaches to the organisation of personalised cancer care: case studies from France, United Kingdom and the Netherlands

Peter Johnson,
Chief Clinician, Cancer Research UK

Peter Johnson gave an overview of the UK's experience of implementing the Stratified Medicine Programme, which is funded by unrestricted grants from AstraZeneca and Pfizer. The environment in the UK was ripe for the establishment of a platform of centres across the country to demonstrate various principles in the delivery of stratified medicine. Firstly, somatic testing for prediction of treatment response in patients with solid tumours was happening only in a piecemeal fashion, and lagged significantly behind the situation in certain haematological cancers. Secondly, demand was high, but funding was not well established or organised. Thirdly, quality assurance was a major issue, with significant variability and reproducibility and accuracy of the tests being carried out. Lastly, it was acknowledged that a system was needed that worked on routinely available diagnostic material and that the future lay with testing for a multiplex panel of abnormalities rather than single diagnostic tests.

Over the course of the two-year programme, diagnostic material from 6 tumour-types was collected for analysis from 9000 cancer patients and the resulting clinical data entered into a central data repository which was then available for mining by researchers and NHS partners. 8 clinical centres and 3 diagnostic hubs were involved which enabled technological comparisons between the three hubs and allowed an understanding of the relationship between turnaround time and the number of repeat tests carried out. A detailed quality control process was run to ensure consistent results. The work done highlighted the critical importance of sample quality, and the need to involve diagnostic pathologists in the whole process.

From the data derived from the NHS Cancer Outcomes and Services Dataset, Cancer Research UK is starting to develop the algorithms that will enable interpolation of time to progression. The aim is to bring in automated data collection and extraction, but currently the complexity of interactions means that a significant amount of data extraction is still manual.

Through the programme, various lessons were learned. Firstly, the programme is highly acceptable to patients, with 98% giving consent. Secondly, the pathology department has a critical role in managing tissue samples, and thirdly there is a substantial impact on workflow in technology hubs.

Key observations and recommendations for delivering stratified medicine in the future include:

- Routine consent needs to be established for research using tissue and data
- Standards need to be established for sample handling, preparation and processing
- Planning for technology hub workflow is imperative
- Data extraction still needs to be done manually until automated data extraction becomes more reliable

The UK is close to having a Next Generation Sequencing (NGS) platform to look at a much broader panel of potentially actionable genes. In the next phase a more concerted approach to pre-screening populations for entry specifically into clinical trials will be taken, focusing first on non-small-cell lung cancer patients and multiple phase I/II studies across the ECMC network.

Emile Voest,
UMC Utrecht

The Netherlands has a bottom-up approach to delivering personalised cancer medicine to patients. Collaboration between the Netherlands Cancer Institute/Antoni van Leeuwenhoek Hospital, the Erasmus Medical Center /Daniel den Hoed Cancer Center, the University Medical Center Utrecht and shortly two other centres, has been initiated to create the Center for Personalised Cancer Treatment (CPCT). The Dutch programme, which was organised with pro-bono support from McKinsey, has a mission of providing more effective cancer treatment by offering personalised therapy and increasing the number of drugs that reach the market and become available to patients.

The CPCT covers the three core activities of DNA-sequencing, research and clinical trials. It has a central facility for pathology, sequencing and bioinformatics. It boasts multiple sequencing platforms in an ISO-certified environment, and a joint clinical trial infrastructure for CPCT studies.

The CPCT is supported by a steering committee (overseeing budgets and proposals), a clinical trial committee (focusing on metastatic disease), a bioinformatics committee, a systems biology centre and a proteomics committee (under construction).

There are three programs currently in force. The Phase I program is a collaboration between a limited number of internationally recognised centres and includes patients in Phase I studies based on genetic profile. The Standard of care program is a collaboration between University Medical Centers, NKI and large teaching hospitals and includes patients treated with standard of care targeted agents. The Discovery program is a collaboration between selected sites based on infrastructure and expertise and includes patients in specific biomarker trials.

The CPCT has been funded by governmental and other types of organisations. Indeed, how to finance such an initiative is a major issue, and a major lesson is that without philanthropic organisations, such a programme would not be possible.

Agnès Buzyn

Chairwoman and CEO, Institut National du Cancer

In France, the National Cancer Control Programme (2009-2013) provides for top-down patient or tumour-centred initiatives related to personalised care and medicine.

In rare cancers, 23 expert clinical centres have been identified and 4 pathologist networks set up for systematic double reading of biopsies. The latter is extremely important since 15% of first readings are incorrect, and a double reading may lead to a significant change in the patient's therapeutic plan.

A programme in genetic predisposition to cancer exists in France, consisting of a network of genetic counselling centres and a network of 25 oncogenetic laboratories.

Furthermore, the National Cancer Plan guarantees equal access to innovative and existing treatments and includes a specific objective to develop cancer molecular genetics hospital platforms and expand access to molecular testing. In this respect, a national programme organised around 28 regional centres has been developed since 2006, coordinated by INCa and the Ministry of Health. The programme is built on partnerships between several University hospital laboratories and cancer centres, fostering cooperation between biologists and pathologists.

Molecular testing is performed for all cancer patients, free of charge for the patient, the pathologist and the hospital, no matter what the status of the healthcare institution (public or private). The programme (which costs €22 million per year) has been shown to be far more cost-effective than treating all patients without prior genetic testing. A quality assurance programme is underway to guide the molecular genetics centres towards ISO accreditation as soon as possible. Furthermore, targeted Next Generation Sequencing for diagnostics is to be rolled out through the programme, with an estimated 60,000 patients benefiting from targeted NGS analysis of their tumour by the end of 2015. As well as increasing patient access to innovative drugs, INCa is also committed to promoting the development of new targeted therapies, and through its CLIP² programme is fostering collaboration between molecular centres and accredited early phase clinical trials centres. The ACSé programme (Secured Access to Innovative Targeted Therapies) intends to systematically explore all potential indications of molecules that have been granted approval or are about to be approved and is open to all French patients with advanced or metastatic cancers presenting a targetable molecular abnormality and who have a life expectancy of three months or more.

Three key success factors for personalised cancer care in France include:

- **An integrated approach encompassing healthcare, research promotion, training of healthcare providers, information to patients and their relatives and observation through databases**
- **Equity of care and best possible chance (for example offering each older cancer patient appropriate care)**
- **Institutional steering (by an agency or healthcare system), where main tasks are well described, where there is regular monitoring and assessment in close contact with the actors, and where annual funding is commensurate with the tasks and activities planned**

Personalised cancer medicine: A vision for the future

Peter Campbell,

Head of Cancer Genetics and Genomics, Wellcome Trust Sanger Institute

Peter Campbell asserted that we are on the cusp of an era where patients will be characterized and genetic changes identified, thereby enabling selection of a drug or drugs that are specific to those changes. Personalised medicine is based on gene-drug interactions. In order to move forward, we need to characterize the genomes of large patient cohorts and measure how they respond to treatment. Given the hugely complicated nature of genomic architecture, and that some mutations are incredibly rare, very large numbers of patients will need to be screened in order to obtain the necessary number for clinical trials.

Personalised cancer medicine is currently characterized by:

- **Meaningful gene-drug interactions available for only a small minority of patients**
- **Very complex genomic landscape for most cancers**
- **Minimal large-scale data on clinical correlations of genomic features**
- **Interventional clinical trials are still under-powered to detect gene-drug interactions**

A real opportunity for Europe lies in the collection and analysis of genomic information, since very large numbers of patients are needed to understand the implications of genomic changes. A dynamic and sustainable '1 million patient knowledge bank' should be considered for Europe, including clinical variables (histology, staging), genomics, treatment and outcome.

The '1 million patient knowledge bank' - challenges and opportunities:

Challenges

Legal and ethical barriers

Data protection and privacy

Collation of genomics and clinical data

Intellectual property rights and data access arrangements

Sustainable funding

Opportunities

Patient advocacy

Policy revision

Active patient involvement

Early data security

Quality assurance programme

Cancer registries and eHealth records

Engagement with pharma

Phase 4, post-approval surveillance

Economies of scale

Data consultancy

The building blocks to implementation of the database are already in place in some countries. What is now required is the coordination and harnessing of data and matching it with clinical data in order to build a knowledge bank. The route to implementation will rely on the following:

The '1 million patient knowledge bank' route to implementation:

- *Open communication between national programmes*
- *Early involvement in patient advocacy groups, ethics/legal/policy advisers and database engineers*
- *Start with interventional clinical trials (need engagement with pharmaceutical industry)*
- *Develop funding models (not-for-profit, public-private partnerships, charitable etc)*
- *A European vision on how data can be brought together*

Roundtable Discussion: 'Making the vision a reality at EU level: A multi – stakeholder approach'

Moderated by Carlos Caldas and Peter Campbell

Panellists:

Kathy Oliver, ECCO Patient Advisory Committee

Maria-Jose Vidal-Ragout, Head of Unit Medical Research, DG Research and Innovation, European Commission

Christine Chateauneuf, Director Oncology Unit, Novartis France

Peter Johnson, Chief Clinician, Cancer Research UK

Emile Voest, UMC Utrecht

Agnès Buzyn, Chairwoman and CEO, Institut National du Cancer

The roundtable discussion centered on how to move from today's reality to the vision presented by Peter Campbell.

In terms of communicating to patients, it is important that the terms being used are clearly defined and that the potential of personalised medicine is not 'over-hyped', whilst not destroying hope either. It is important to be aware of the substantial challenges that are ahead and the huge barriers that stand between science and care.

A sense of realism must be maintained, and technologies available at present should be exploited to help patients access novel treatments for their particular cancer type. Beyond this, the move into whole genome sequencing will be an exploratory endeavour which will allow us to define the landscape and assess how the data can be collated with clinical data. The latter is a major challenge at present, and until solutions are found we are likely to remain ignorant of the implications of sequencing on populations and individuals. Healthcare systems across Europe need to reflect on how they can move towards concerted acquisition of clinical data in something that resembles an interchangeable format. Molecular information that is tied to clinical outcomes and responses to treatment is required, and having universal registration is an important first step. Unfortunately, data collection is far from uniform across Europe and in some areas there is no universal registration.

Europe does not boast a highly developed standardized medical records system that is comparable between countries, but linking medical records and laboratory tests would hold tremendous opportunities for discoveries.

Vast amounts of data can be gained from patients themselves, and in the UK, one registry is piloting a scheme called the Brain Tumour Portal, where patients can not only consult their data on the registry but also deposit information into their records. If successful, the scheme may be rolled out to other cancers in the UK.

Whilst the discussion so far had centered around genomic analysis of the tumour itself, another layer of complexity emerges when the molecular characterization and analysis of the host immune response is considered. The current challenge of diagnostics is to build new 'microscopes' at the genomic level, at the DNA level, at the RNA analysis level, at the protein interaction level and also at the host immune response level so that we fully understand what we are treating.

Tracking metastatic disease is important, including taking tissue samples at the start of treatment, since this enables valuable information to be gleaned on patient response to treatment, the duration of disease-free survival, how standardization of data and quality control should be used, and all of this contributing to our ability to truly implement personalised efforts in cancer treatment.

How personalised cancer medicine will be funded is not obvious, since national providers and healthcare systems need to rely on evidence of what is clinically useful but such evidence is lacking. The most important priority is proving the clinical validity, which requires more translational research. In some respects, H2020 may therefore be a driver to reach the vision set out by Peter Campbell. Indeed, the Health, Demographic Change and Wellbeing strand of H2020 is designed to foster cross-fertilisation of diseases and disciplines, and since it is merged with the previous ICT programme, will also integrate technological aspects, thereby providing opportunities for data-sharing, biobanks etc. It will also incorporate public health research and provide the evidence base for therapies and models of care.

From the industry's perspective, collaboration and dialogue is crucial, as well as a sound regulatory framework. Collaboration in the field of data analysis may be achieved through the Innovative Medicines Initiative if it were to be extended also to diagnostics, since this is an area where pharmaceutical companies possess a lot of information but may not be best equipped to analyse samples. Indeed, industry is open to collaboration and data sharing in this regard within a well-defined framework. From the researchers' perspective, data held by the pharmaceutical industry should be made available to the academic community for analysis which may shed light on reasons for drug failures et cetera. ECCO could facilitate such a discussion with the pharmaceutical industry.

Indeed partnerships may provide win-win situations for all actors dealing with personalised medicine. Industry will be dependent in the future on having good diagnostic platforms through which the utility of new targeted therapies will be demonstrated so it is natural that they work together with healthcare providers to create and sustain such infrastructures. Furthermore, having political and financial backing for bringing the power of genomics to bear on cancer medicine through governmental support is beneficial, since such orientations in the UK have led to the launching of pilot projects which may be expanded into routine care later on. It is critical to put patients at the centre of all collaborative efforts and draw on their insight and experience to advance initiatives in the best way.

With regards to political lobbying at EU level, it was observed that professional societies and industry very often work in separate silos and that this should be addressed in order to be more effective. Furthermore, strong patient societies must engage in a meaningful way with professional societies in order to ensure patient centricity in all advocacy messages and activities.

Concluding recommendations:

- **National programmes should focus on the delivery of genomic testing in clinical practice and develop models for accessing clinical data, with the aim of eventually merging it with genomic data. The subsequent step will be how to aggregate it across national boundaries**
- **Maintain and intensify the dialogue at EU level within the Oncopolicy Forum**
- **Clarify the regulatory framework with criteria for combination drugs and with criteria for general value assessment of drugs including the societal benefits and quality of life of the patient**
- **Big and open data for research is important and in particular the sharing of genomic and clinical data**
- **New models for clinical research as well as for evaluating drugs in the genomic era**
- **Ensure that data is collected and stored in a database. Samples must be fresh and well collected. Biological samples should be stored in biobanks. Biobanks together with good clinical registries will provide a huge opportunity to address pressing questions**
- **A major challenge is how to acquire clinical data and how we are going to bring patients on board to achieve this**
- **Patients can be not only research subjects but research allies as well. Patients should be truly considered partners in personalised medicine all the way from science to care**
- **European Commission is part of the solution since it can help to integrate national activities with a view to scaling them up and providing evidence for the value of certain approaches**

Session Four: European Reference Networks - Facilitating Personalised Care for Rare Cancer Patients?



Chairs: Paolo Casali and Kathy Oliver

Paolo Casali

Head of Adult Sarcoma Medical Oncology Unit, Istituto Nazionale Tumori, Milan

The EU Directive on Cross-Border Healthcare, the first piece of legislation ever to address reimbursement rights on healthcare provision in Europe beside the Social Security legislation, was adopted in 2011. In accordance with the subsidiarity principle, healthcare is a competence of Member States, but the EU may intervene in matters related to the movement of patients over borders.

Three principles are enshrined in the Directive:

- The right to choose and be reimbursed, under certain circumstances, for healthcare provided anywhere in the EU
- More transparency about patients' rights, treatment options or the quality and safety levels of healthcare providers
- Strong focus on cooperation amongst Member States in the following: mutual recognition of prescriptions, eHealth, Health Technology Assessment, European Reference Networks

One of the aims of the directive, whose transposition deadline was 26 October 2013, is to improve access to highly specialized healthcare to patients for conditions requiring a particular concentration of expertise. It requires the European Commission to support Member States in the setting up of European Reference Networks of Centres of Expertise and healthcare providers. Criteria for networks as well as for their members are currently being drawn up. Pilot networks financed by the Public Health Program like ExPo-r-NET (European Expert Paediatric Oncology Reference Network for Diagnostics and Treatment) will help to test the model in the field of paediatric oncology.

A strong element of the networks will be E-health. Benefits and incentives for healthcare providers include improving their experience, knowledge and capacity, and gaining international recognition for their quality and expertise.

The development of the European Reference Networks is being carried out with extensive consultation with and explicit support of Member States, with legal acts due to be adopted in early 2014 and first calls for candidates of ERNs in the next two years.

Issues the oncology community should reflect on include whether it will be possible to create a common network and integrated approach for rare cancers across the EU, and whether it will be feasible to produce common, European multidisciplinary guidelines, including referral criteria, for creating the networks.

Roundtable 'European Reference Networks for rare cancers'



Moderated by Kathy Oliver

Panellists:

Paolo Casali, Head of Adult Sarcoma Medical Oncology Unit, Istituto Nazionale Tumori, Milan
Martin Jansson, Coordinator National Specialized Medical Care, National Board of Health and Welfare, Sweden

Jana Pelouchova, ECCO Patient Advisory Committee

Allen Crook, Vice President Commercial Portfolio Europe, Pfizer

Paolo Casali stated that this initiative represents a huge opportunity for rare cancers, where it is crucial that research and care are considered together. One concern is over the sustainability of the networks and whether responsibility for this will lie with Member States or with the European Commission. Another concern is over funding of the networks, since they will require significant resources including medical time, and the question of how to stimulate Member States to invest in them needs exploring. It was suggested that industry work with governments in public-private partnerships to fund and sustain the networks, in which case very specific criteria and roles for each partner would need to be defined.

From the industry's perspective, Alan Crook recommended that the oncology community advocates that Member States put in place the right healthcare structure to ensure that personalised medicine is realized and results in improved outcomes. He suggested that the INCa model of molecular testing be implemented through a European network.

Martin Janssen gave his experience from a national perspective. In Sweden, regional cancer centres are being set up to improve collaboration between patients and professionals. When knowledge is centralized and concentrated through networks, results can be very positive, especially at European level since some highly specialized services are unevenly distributed throughout the continent. Improved collaboration between national and European levels is also of great importance.

European Reference Networks face three main challenges:

- **Correlation with national processes**
- **Definition of diseases and treatments most benefitting from networks**
- **Definition of an upper end scale for the criteria for Centres of Expertise**

Jana Pelouchova explained that the European Reference Networks are clearly of benefit to patients but that various hurdles exist at the level of national authorities where in many countries no coordinating centre exists.

Paolo Casali added that professional societies could contribute to fostering collaboration through dealing with semantics used in medical records since some of the biggest challenges lie in semantics rather than in interoperability. Indeed, SNOMED Clinical Terms is a tool that provides the core general terminology for electronic health records.

E-health being a key driver of the initiative, the EU needs to put it high up on its agenda and ensure that sufficient funding is dedicated to its development.

Session Five: Evidence and policy - Towards optimal prioritization of scarce resources in oncology



Chairs: Paolo Casali and Ulrik Ringborg

Ulrik Ringborg

Secretary General, European Academy of Cancer Sciences

Ulrik Ringborg introduced the session. The Academy is an independent advisory body of oncologists and cancer researchers placing science at the core of policies to sustainably reduce the death and suffering caused by cancer in Europe. The Academy boasts over 170 fellows from 20 countries spanning a wide range of disciplines and specialties and it is anticipated that with annual elections to bring in the best knowledge and expertise, it should grow to over 300 fellows in the future. The Academy addresses topics where evidence is lacking or where there is lacking of consensus on the evidence and aims to inform cancer research strategies for the future.

The Academy works closely with ECCO and provides evidence-based input to inform its policy activities. The four taskforces showcased during this session are connected by the fact that in each of the four domains, evidence is either lacking or there is lack of consensus on the evidence, both of which lead to deficiencies in evidence-based medicine. The taskforces therefore seek to analyse the challenges at hand and suggest strategies for addressing them.

Tobacco control

Richard Peto (reported by Ulrik Ringborg),

Professor of Medical Statistics and Epidemiology, University of Oxford

Ulrik Ringborg reported on the taskforce on tobacco control as Richard Peto who is leading the work was unfortunately unable to attend in person.

Primary prevention of cancer is plagued by difficulties in implementing new information into effective prevention programmes. The full, lifelong risks of smoking are now known thanks to pioneering studies by Sir Richard Doll. Latest epidemiological studies by Peto et al¹ show that whilst smoking kills, stopping smoking reduces mortality risk. Recent studies in France from 1990 to 2005 resulted in the 'triple, halve, double' mantra conclusion where tripling cigarette price led to a halving in cigarette consumption and a doubling of governing income from tobacco. Whilst information about the carcinogenic effects of smoking may not be enough to change peoples' behaviour, it is clear that political decisions may have very significant impacts. The evidence coming from this taskforce therefore provides compelling arguments for the EU to take political action to curb the use of tobacco in Europe.

Early detection of breast cancer by screening

Sonia Hernandez-Diaz,

Associate Professor of Epidemiology, Harvard School of Public Health

While mammography of breast cancer by screening has been used for the early detection of breast cancer for decades, and complies with the WHO principles for screening, it is important to consider cost-effectiveness and the willingness of public health systems to conduct these programmes. Strong evidence, ideally from clinical trials, is needed to support the effectiveness of screening programmes, and it has to make financial sense to invest in them rather than in other public health programmes or initiatives in a particular country.

While breast cancer mortality is decreasing in some areas, it is impossible to know whether this is due to screening or therapeutic improvements and the impact of screening in the reduction of mortality due to breast cancer is increasingly debated with estimates ranging from 0 to 50% reduction in mortality attributed to screening. The harms of screening

are well known: false positives, overdiagnosis and overtreatment, and some opponents have gone as far as saying that 'screening for breast cancer with mammography causes more deaths than it prevents' (Peter Gøtzsche). The challenge is now to understand how to move forward by examining methodological issues of past studies and by designing future research so as to avoid lead time and length time bias, confounding and exposure misclassification. Screening programmes themselves may be improved by targeting screening to specific subjects (e.g. high risk groups). It should be assessed whether imaging, pathology, molecular biology and genetics can improve prediction and reduce overtreatment and whether multidisciplinary teams can improve treatments and use less invasive procedures.

The objective of the Academy taskforce is to provide independent evidence-based information for policymaking to improve prevention of breast cancer mortality and suggest a strategy for further research to develop early detection of this disease.

Recommendations that will be delivered in the final report include the following:

- **Target who, when and how to screen**
- **Target treatment, reduce the morbidities associated with treatment and overtreatment**
- **Methods for design, analysis, cost-effectiveness evaluation and interpretation of evidence**
- **Proactive surveillance of Screening Programmes**
- **Communication of evidence to patients and policymakers**

¹ The 21st century hazards of smoking and benefits of stopping: a prospective study of one million women in the UK
Kirstin Pirie, Richard Peto, Gillian K Reeves, Jane Green, Valerie Beral

The Lancet. 12 January 2013 (Volume 381 Issue 9861 Pages 133-141 DOI: 10.1016/S0140-6736(12)61720-6)

Ulrik Ringborg photo: ©Anette Bodinger

Evidence-based cancer medicine and cost-effectiveness

Bengt Jönsson,

Professor of Health Economics, Stockholm School of Economics

This taskforce is built around the vision that 'to maximize the impact on population health, decisions about access and use of new cancer therapies by patients, payers and providers should be based on relevant evidence on effectiveness and cost-effectiveness.' The members of the taskforce reflect the multidisciplinary character of the issues involved. Indeed, for maximum impact at a population level, a multi-stakeholder approach is needed, drawing on medical and clinical evidence as well as input from patients, policymakers and payers.

The issues have primarily been addressed in relation to the development and introduction of new cancer drugs and accompanied diagnostics. But it is as important for other technologies used in cancer medicine, for example surgery and radiotherapy, and preventive technologies such as screening programs for early detection. For new cancer medicines, there are some studies that provide systematic, but incomplete evidence, evidence on variations in access. The main conclusion is that there is large variation between countries, both regarding the total use of cancer medicines (measured in monetary value, Euro), and for specific cancer medicines (measured in quantity).

Variability in the availability of therapies has implications on cancer outcomes across Europe. Indeed, some Member States cannot afford even the 'old' treatments let alone the new technologies that exist. There is a clear need for a solution to be found at European level in order to improve the ability of healthcare systems to make rational, evidence-based decisions on resource allocation.

The kind of evidence that healthcare systems need include: improvements in outcome (population health, encompassing equity aspects) and cost-effectiveness (which patients will benefit most in relation to price). Personalised medicine will inevitably change the way data needs to be collected. For example, clinical trials will become smaller, faster and need to be more precise and will be driven by molecular pathways and imaging. It will also increase the need for follow-up studies to provide evidence on outcome in clinical practice. Indeed drugs in combination and sequence will need to be evaluated.

A key conclusion of the taskforce is that the discussion now needs to move away from price and towards evidence and value. Policy recommendations include supporting the collection of relevant evidence data through the study of treatment patterns and outcome in clinical practice and follow-up studies in clinical practice to verify predictions from clinical trials; and collaborating at EU level to develop methodologies for rapid access to outcome data. All relevant stakeholders (patients, payers, industry and the research community) must be involved.

Cancer survivorship

Pernilla Lagergren,

Professor of Surgical Care Sciences, Karolinska Institute, Sweden

Many definitions of cancer survivorship exist today, but the most widely used is that developed by the National Coalition for Cancer Survivorship: 'The experience of living with, through and beyond a diagnosis of cancer'. As family members, friends and caregivers are impacted by the survivorship experience they are therefore included in the definition. Survivorship issues are very important for several reasons. Due to improvements in diagnosis and treatment, cancer patients live longer and more are cured. However, survivors are at risk of late and long-lasting effects and there is limited knowledge of the prevalence and impact on healthcare needs. Furthermore, patients want optimal treatment, they want it to be evidence-based, multidisciplinary and want care to be holistic and patient-centred. The Academy taskforce on cancer survivorship is based on the need of investigating the current state of affairs in cancer survivorship care and research in Europe in order to provide guidance regarding future service delivery and research agendas.

The taskforce has put together a survey, which will be the first of its kind in Europe, to map the survivorship landscape in Europe through looking at what survivorship services are delivered, which research activities are ongoing and planned, the education and training needs of different professionals and the barriers and challenges in providing services and conducting research. Patient perspectives will also be an important element of the study. Future orientations for survivorship strategies include further research in prevalence of late effects in cancer survivors, and inclusion of the elderly and those with chronic illnesses in research (these make up the largest group of cancer survivors but are often excluded from trials and other studies), infrastructures to routinely assess patient-reported outcomes in different cancer diagnoses. National registries may be a highly effective resource in the future for cancer survivorship research, providing they include patient-reported outcome measures. National cancer plans are also an important tool for the inclusion of survivorship issues in healthcare systems.

Prioritisation of scarce resources in oncology

Paolo Casali,

Head of Adult Sarcoma Medical Oncology Unit, Istituto Nazionale Tumori, Milan

Paolo Casali discussed the role of clinicians in decisions about allocation of resources. Physicians have an ethical obligation to treat patients when they become ill, and should not be asked to take decisions on resource allocation themselves. The role of the physician in the discussions should be to bring expertise to the table, but it is the role of policymakers to take responsibility for decisions in this field. Furthermore, the issue is a public health matter, and individual clinicians, who treat individual patients, cannot have the perspective of population health decisions. A real risk for clinicians today is that policymakers do not take clear decisions. Only with clear decisions can clinicians explain and discuss treatment options with their patients.

The changing landscape of drug development

Gunnar Saeter,

Head of The Institute for Cancer Research at Oslo University and former Global Director of Scientific Affairs, Merck Oncology

Gunnar Saeter gave his personal reflections having spent 33 years working in oncology, both in the pharmaceutical industry and in academia.

Currently it costs around 1.5 billion to bring a molecule to the market. P-values have been used to indicate efficacy of new drugs in clinical trials. Large numbers of patients are needed to carry out these kinds of trials, many seeing no benefit, and perhaps experience significant toxicity.

The cost of developing drugs, and the implications on trial participants, mean that it is no longer sustainable for industry to continue with this model.

The drivers of cost escalations in drug development are multiple. Firstly, there is a very high failure rate in oncology – until recently 90% or more drugs entering phase I trials never reached the market, and even in phase III there was a 50% failure rate. Such failure rates can be attributed to several factors: lack of sufficient rationale, a strategy without patient selection, and a single-agent focus with rapid development of resistance. Furthermore, proof of concept data did not really exist.

The vastly improved biological understanding today may provide some remedies for these failures. Indeed we now have a much more solid rationale for drug development programmes, we have many good targets which are highly relevant and we have specific drugs that interact with these targets, enabling personalised treatment. Biomarker-based prediction is being developed so that patients can be selected who have the highest probability of effect. We are also looking at drug combinations early in drug development rather than at the end of the line. There is also substantial focus on improving and accelerating the clinical study design. The bar is higher now than it once was to bring a compound from the pre-clinical research discovery phase into clinical development. There is a much more dynamic study design with phase I trials being expanded into early phase II trials and larger phase II trials going into phase III, meaning a flowing developing study design rather than separate studies.

Highly innovative trial designs are being used in some areas where data is used to refine the trial design throughout its course and where a lot more information is being derived from far fewer patients.

Whilst speedy demonstration of efficacy is a positive thing, attention also needs to be paid to long-term drug tolerability and toxicity. With a new generation of targeted drugs, we see that chronic, low-grade toxicity can manifest for a very long time, which may be more bothersome than acute, short-term toxicity as seen in traditional chemotherapy.

Tumour heterogeneity is a major challenge, with tens of thousands of mutations identifiable within single tumours, and bioinformatic interpretation is required to address this.

The recent discovery of and progress in immunotherapy is of key importance. Immunity is seen in relation to the tumour but also in relation to the patient's own immune capacity and capability. One of the needs of the coming years is to see these in context and to try to develop effective strategies addressing both the cancer cell signalling abnormalities and immune opportunities.

The main players in the field of cancer drug development tend to focus on the same targets, leading to problems of diversity in cancer research as well as increased competition. There is a need for increased pharma-pharma collaboration in drug development, which, while not easy, is nonetheless very important. Given the need for increased risk reduction within large companies, molecules need to be developed further before being acquired, or before pharmaceutical companies collaborate with biotechnology companies. The result is that biotechnology companies have a higher exposure to risk. An increased need for venture capital proliferates, and in recent years this has been more difficult to acquire.

In the United States, fast-track evaluation is carried out for very promising compounds. Consequently there are going to be more conditional approvals with post-approval data requirements. Furthermore, guidelines are being set out for development of combinations.

Regulatory trends and needs in cancer drug development:

- **Stronger focus on 'clinical benefit' (efficacy vs toxicity)**
- **'Fast-track status' and 'breakthrough designation' (FDA)**
- **Increased regulatory interaction during development**
- **Conditional approval and post-approval data requirements**
- **Guidance for early development of combinations**
- **Drug and diagnostic co-assessment**
- **Regulatory and reimbursement coordination**
- **Increased focus on HTA and cost-benefit**
- **Increasing biologic understanding of the individual tumour with pathogenesis-directed, individualized treatment**
- **Biomarker-driven therapy with more narrow indications, but higher efficacy will give higher segment penetrance**
- **Increased Pharma competition due to pursuit of the same targets**
- **Early combinations of novel compounds to address the complex pathology and avoid resistance**
- **Increased regulatory and reimbursement scrutiny, new pricing models needed**
- **Large investments still needed, even if failure rate drops**
- **Shift in share of development and risk exposure from Big Pharma to Biotech**
- **The field collectively possesses huge expertise, but with a highly specialized distribution**

Roundtable discussion 'Evidence and policy as tools for facilitating ethical, equitable and cost-effective allocation of resources in oncology'

Moderated by Alexander M.M. Eggermont,
President, European Academy of Cancer Sciences

Panellists:

Gunnar Saeter, Head of The Institute for Cancer Research at Oslo University and former Global Director of Scientific Affairs, Merck Oncology

Sonia Hernandez-Diaz, Associate Professor of Epidemiology, Harvard School of Public Health

Bengt Jönsson, Professor of Health Economics, Stockholm School of Economics

Pernilla Lagergren, Professor of Surgical Care Sciences, Karolinska Institute, Sweden

Jan Geissler, ECCO Patient Advisory Committee

Paolo Casali, Head of Adult Sarcoma Medical Oncology Unit, Istituto Nazionale Tumori, Milan

There is a continuum of problems all the way from carcinogenesis to early detection and screening through to various treatment modalities and outcome assessment, including economic aspects, and survivorship issues. It is becoming increasingly important to be economically savvy in all of these areas in order to progress in a rational way.

In the screening world in general, early reports have been rather optimistic. However, the issues are complex, and false positives are an inherent problem of screening programmes and lead to invasive surgical procedures. Furthermore we may confound decreases in relative mortality and absolute drops in mortality which are modest at best. The answer to differentiating between dangerous and inconsequential tumours may lie in combining imaging technology with a biological test. Liquid biopsies may open the door to testing large groups and identifying high risk groups by molecular signature. Venture capital money is needed for the development of new technologies to improve diagnostics.

Regarding drug development, far too many molecules reach the pre-clinical stage, resulting in large volumes of phase I trials as well as huge redundancy due to overlapping pipelines of drug companies. A shared up-front risk model should be created that goes hand in hand with a shared later risk model. Involving academic researchers in the development of strategies and research models has the potential to reduce such redundancies.

Involving patients in research is crucial, and the IMI project EUPATI (European Patients' Academy on Therapeutic Innovation) aims at increasing the capacities and capabilities of well-informed patients and patient organisations to be effective advocates in medical research.

The European Academy of Cancer Sciences was created to respond to the challenges of providing definitions, analyses and evidence-based strategies for structuring research and processes from carcinogenesis, screening, innovation of new treatments and survivorship issues. It is important to remember that if the whole problem is not tackled in its entirety, gaps in development plans will become exposed and will be the bottlenecks in overall improvement of the system. At each step, it is important to assess cost and benefit. Each member of the community must assess how they can play a role in helping move the system forward.

Session Six: Oncopolicy 2020 - Taking things to the next level



Chairs: Martine Piccart, ECCO President-Elect and Kathy Redmond, ECCO Policy Committee members

Panellists:

Alexander M.M. Eggermont, President, European Academy of Cancer Sciences

Julio Celis, Chair Policy Committee, ECCO

Vincenzo Valentini, President, European Society for Radiotherapy and Oncology

Jan Geissler, Member Patient Advisory Committee, ECCO

Paolo Casali, Head of Adult Sarcoma Medical Oncology Unit, Istituto Nazionale Tumori, Milan



Panellists were asked to comment on the key messages coming from the Oncopolicy Forum, and in particular which of these should be taken up and acted upon by the cancer community.

Julio Celis stated that success in cancer research depends on investment and sustained actions. It is important to remember that 95% of cancer research funding is rooted in national programmes and as such collaboration between Member States is crucial. H2020 calls will be challenge-driven rather than disease-specific and whilst there will be plenty of opportunities for cancer research, it is up to our community to make the most of them. Furthermore the cancer community must further organise itself in order to continue to shape policy. A long-term strategy for cancer research is needed and as such the top experts in oncopolicy must be identified to participate in future activities. The Scientific Panel for Health provides a platform for organised input and will rely on expertise from various stakeholders including academics, oncology professionals, patients etc. to fulfil its mandate.

Paolo Casali stated his top three priorities: the Cross-Border Healthcare Directive and the setting of rules for networks and centres of expertise; the Clinical Trials Regulation and finally the Data Protection Regulation.

Vincenzo Valentini stressed the need to define personalised medicine in the correct way in order to ensure better engagement of patients. Personalised care means that professionals and patients must share treatment and organisational values. Secondly, consensus on the definition of multidisciplinary and its translation into organisational frameworks of cancer centres is crucial. From now until 2020, hospitals must be challenged to ensure all hospitals treat patients in a multidisciplinary way.

Alexander Eggermont reiterated the value of an independent body of excellence such as the European Academy of Cancer Sciences in providing evidence-based support for policymaking in Europe across the whole cancer continuum. A sustainable policy agenda requires recourse to economics and as such economists must also be involved. Regarding the 1 million patient knowledge bank, the complexity of this is such that digital analysis, diagnostics, storage and analysis would be needed. Data protection issues will therefore be of prime importance and it is important that the oncology community is capable of explaining its position to policymakers in order to avoid burdensome legislation that will prohibit advances being realised.

Jan Geissler reiterated the importance of collaboration, not only between professionals and patients, but with industry, nurses, and all actors who can help generate evidence over and above simply survival statistics. Regarding the 1 million patient knowledge bank, it may be difficult to reach this mass of patients due to there being so much scrutiny of research. Better communication to the public about the benefits and risks of research is needed.

Martine Piccart gave strong support to the idea of the 1 million patient knowledge bank and suggested that EU grants could provide the seed money for collection of sequencing data in a common database which could be held within a European Bioinformatics Institute. Furthermore, collaboration between national cancer registries, such as through the EURECCA project, has the capacity to identify different patterns of treatment and corresponding outcomes, thereby enhancing multidisciplinary and harmonised care.

Martine Piccart thanked the participants and organisers for a successful 2013 Oncopolicy Forum and closed the meeting.

Report drafted by Anna Rouillard.



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