



La Radioterapia guidata dalle immagini: dalla Radiomica alla Oncopolicy



V. Valentini
Università Cattolica S. Cuore – Rome



Accredited Center
2008-2011

Prof. Donal Hollywood



ESTRO Vision 2020

Every cancer patient in Europe
will have **access**
to **state of the art radiation therapy**,
as part of a **multidisciplinary approach**
where treatment is **individualised**
for the specific patient's cancer,
taking account of
the **patient's personal circumstances**.

ESTRO Strategy Meeting - Radiotherapy & Oncology - 2012



Donal Hollywood Award

Annual award at ESTRO meetings

- Best abstract submitted

- Selection criteria:
 - clarity, supporting data, scientific rigour,
 - potential significance, interest in the topic chosen
 - innovation or usefulness

Based on:

- clinical aspects in even years,
- interdisciplinary in odd years
- The abstract will be selected by the Scientific Programme Committee, based on:
- Awardee receives free registration and travel to the meeting





La Radioterapia guidata dalle immagini: dalla Radiomica alla Oncopolicy

la 'Knowledge Based Oncology'

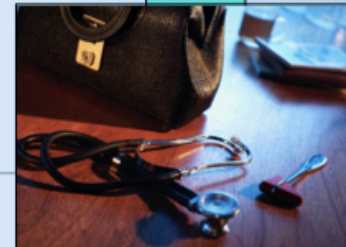
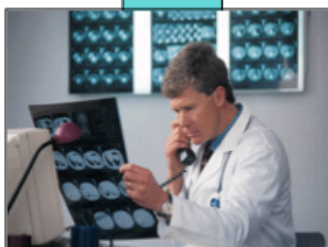


THERAGNOSTIC PARADIGM

BEFORE

TREATMENT

AFTER



- Diagnosis
- Staging
- Target volumes
- Planning

In room imaging (IGRT_{p.d.})

Off-line / On-line

Theragnostic Imaging

(biologically adapted prescription)

- Early toxicity

- Response evaluation
- Tumor recurrence
- Late toxicity

Follow-UP

Soren M. Bentzen – modif. , 2006



Bentzen S – Lancet Oncology - 2005

THERAGNOSTIC PARADIGM

BEFORE

TREATMENT

AFTER



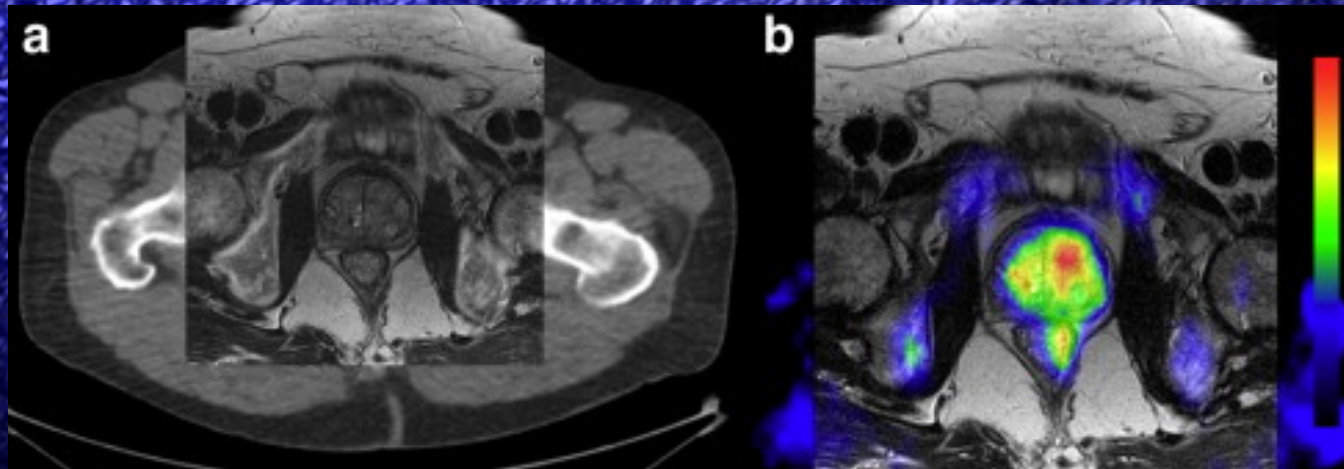
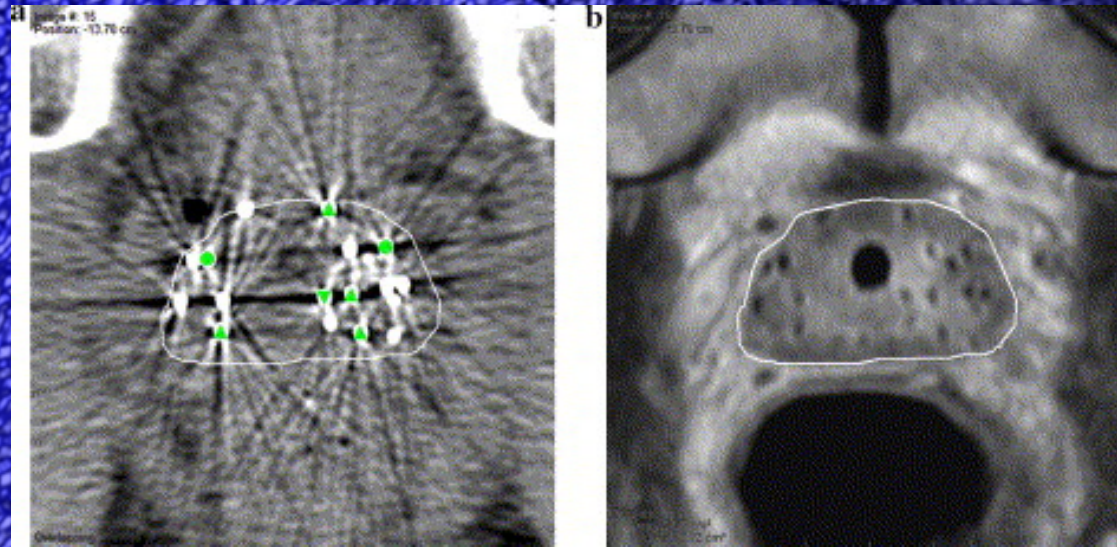
- Diagnosis
- Staging
- Target volumes
- Planning

Source: Soren M. Bentzen – modif. , 2006



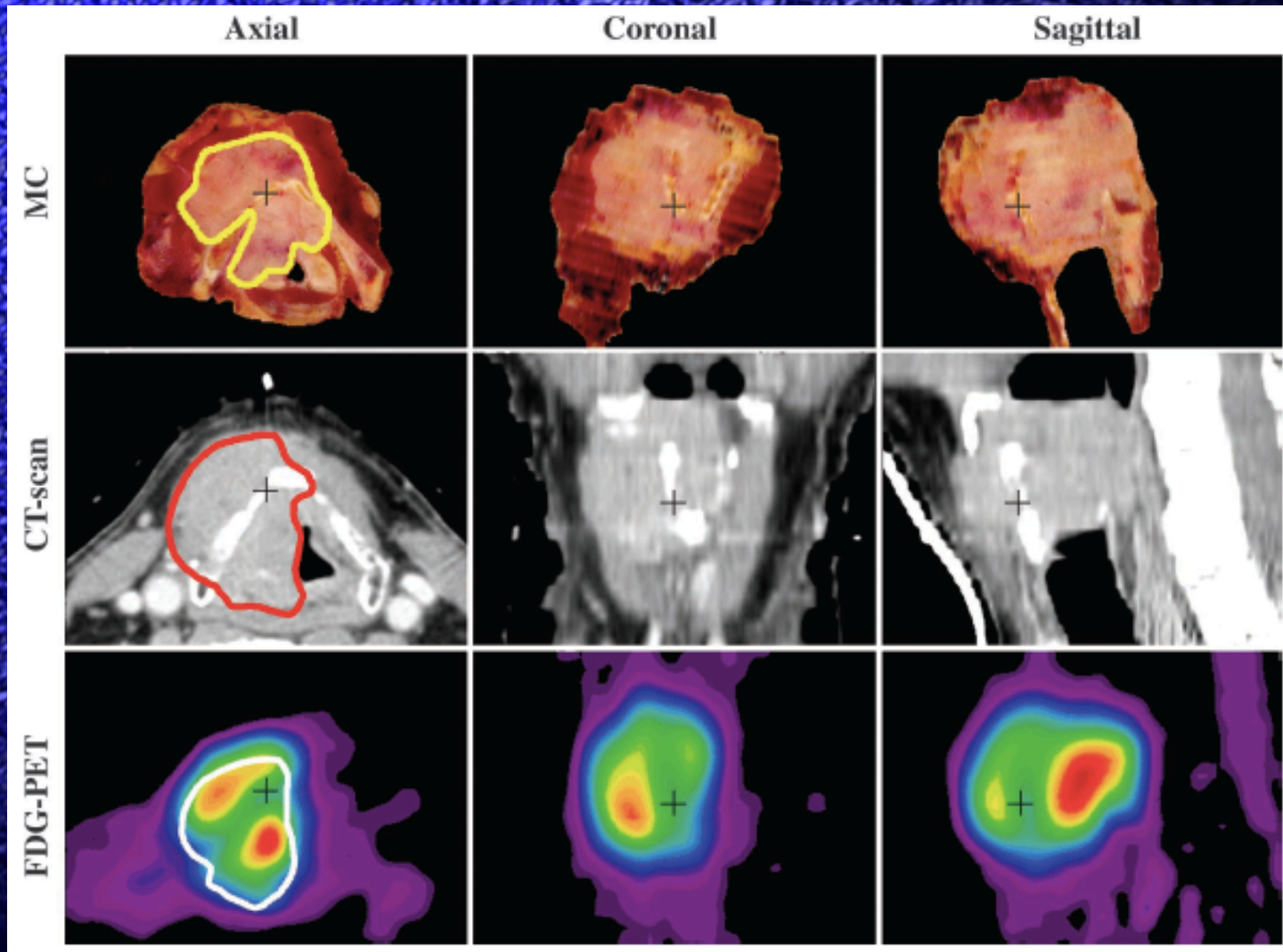
Bentzen S – Lancet Oncology - 2005

Imaging fusion

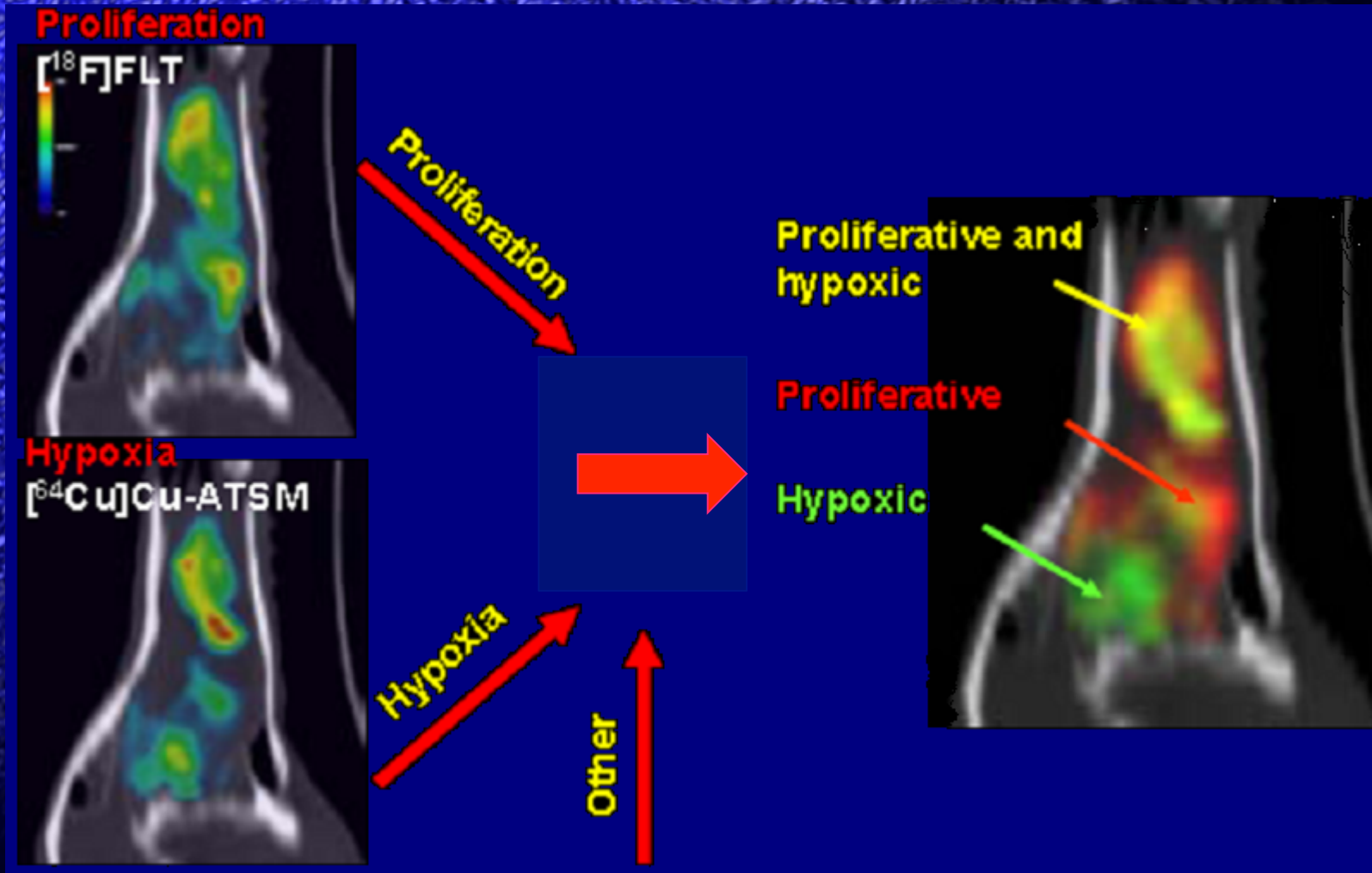


Tanaka O et Al – Radiot Oncol - 2006

Imaging fusion

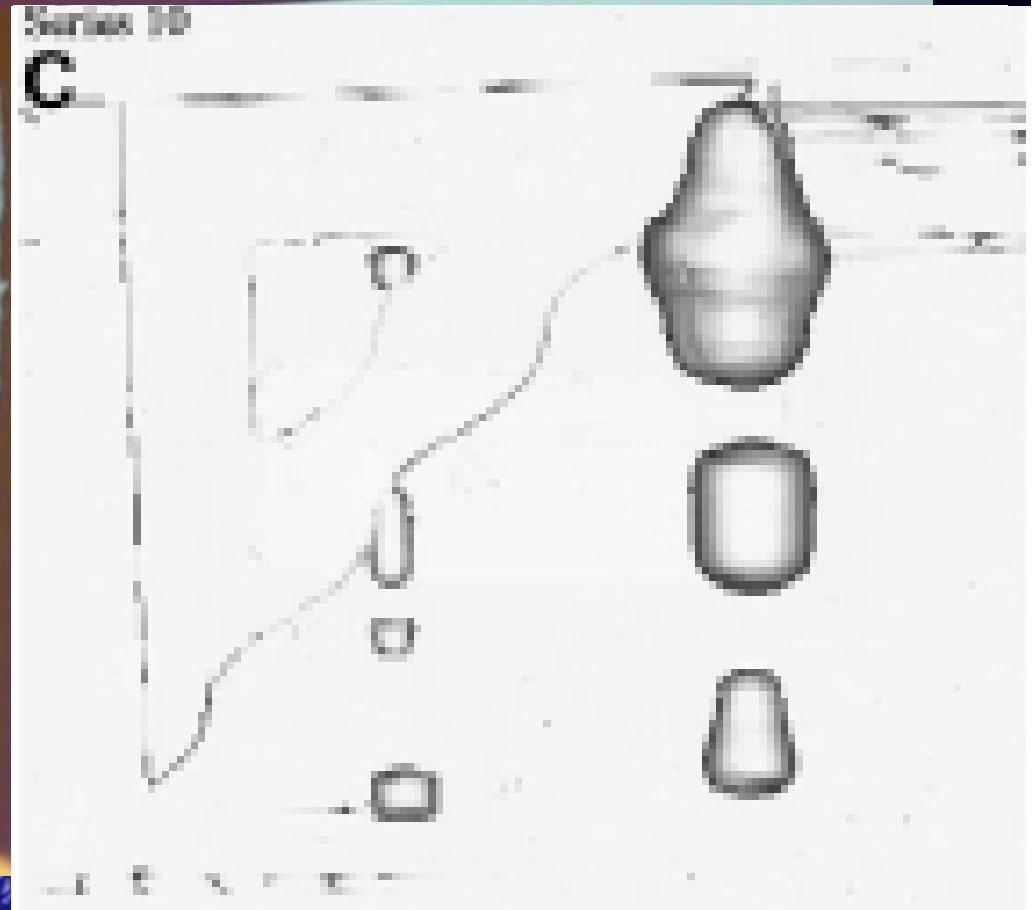
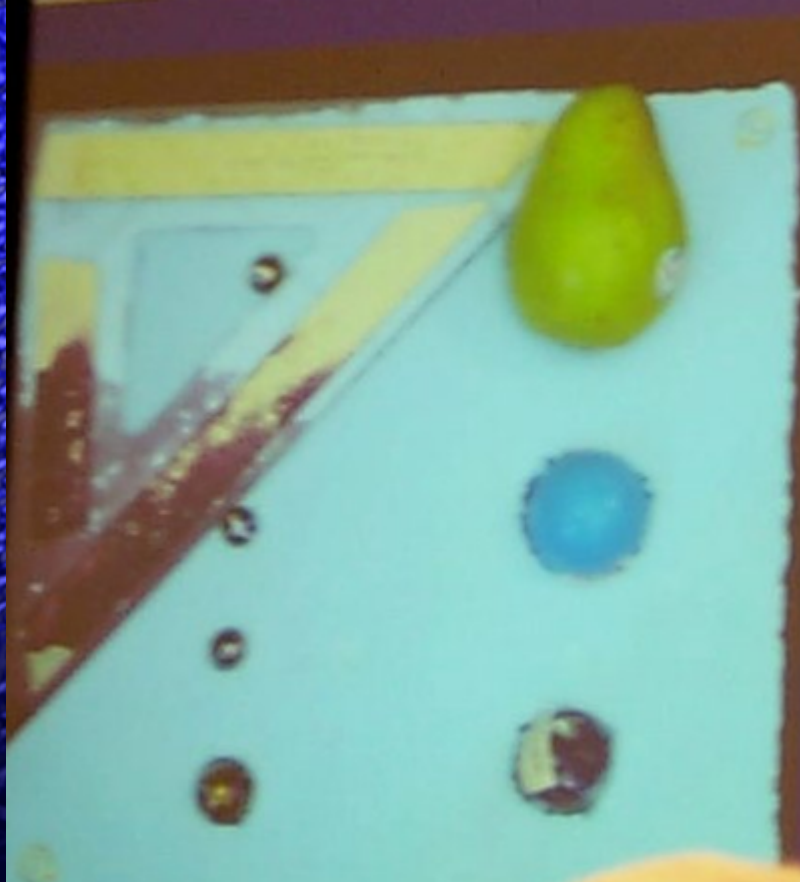


Theragnostic imaging: opportunities



By the courtesy of R.Jeraj and S.Benten

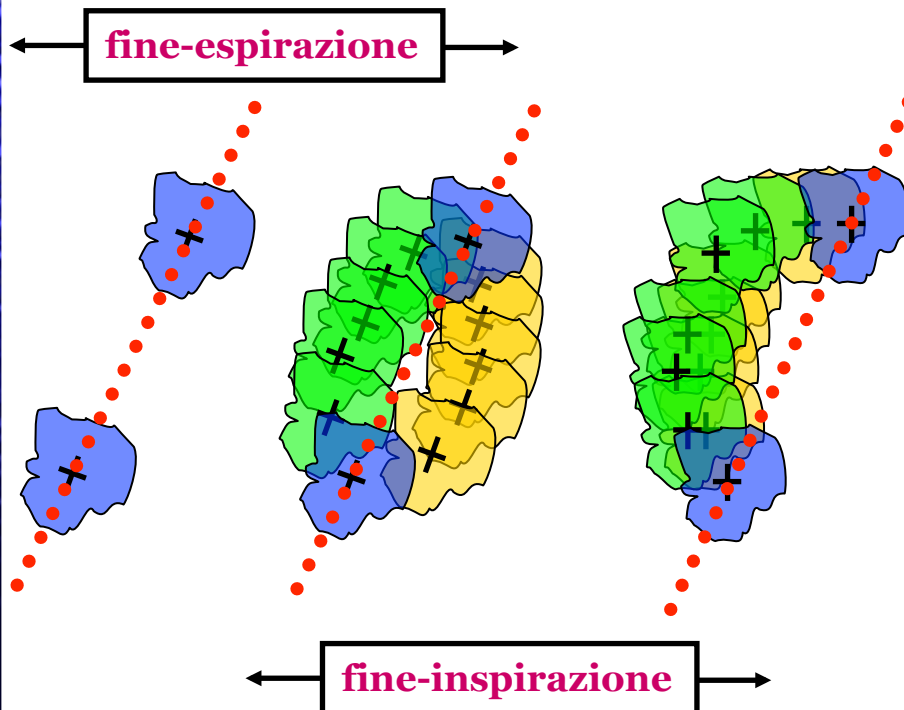
Theragnostic imaging: opportunities



4D: navigation by time - movement

Predictability tumor movement

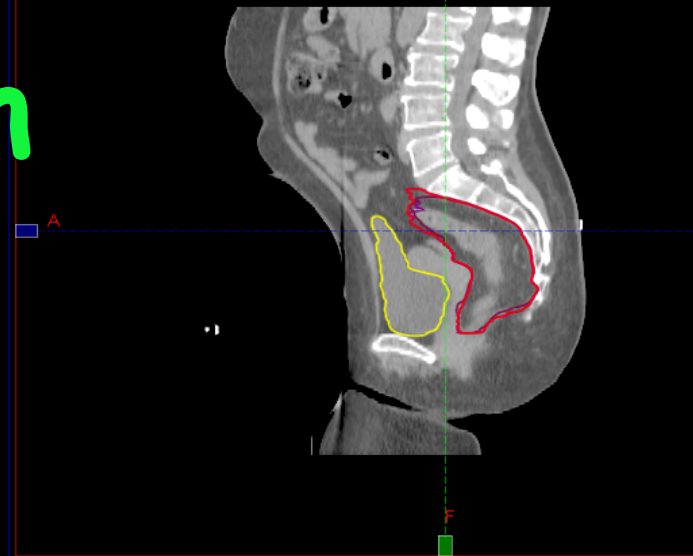
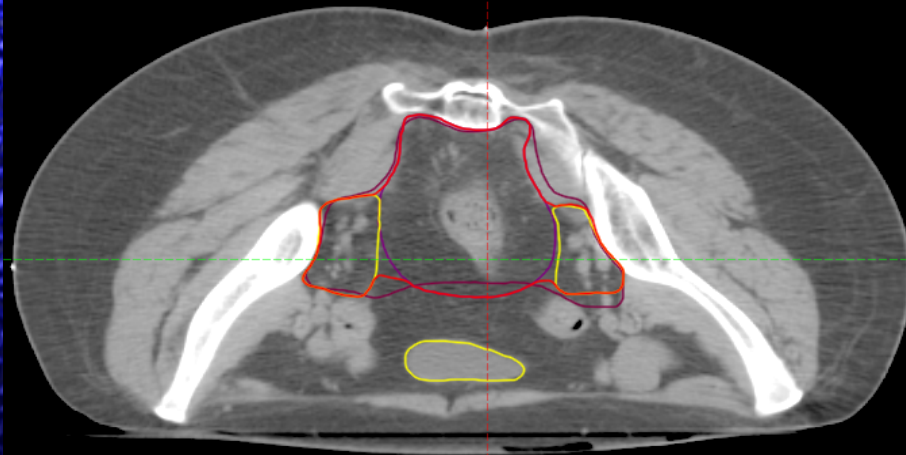
Isteresi tumorale



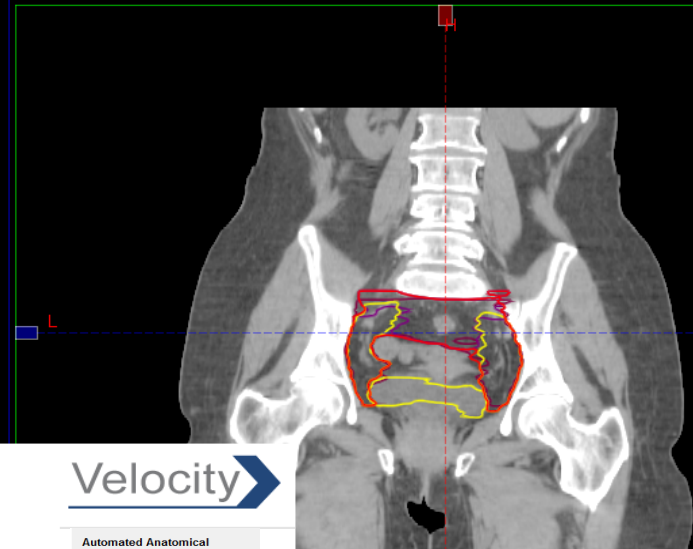
VUMC Amsterdam

Knowledge Based Technology

Autodelineation



Frontal - CT 1 - 4/16/2012 14:59



ABAS
Atlas-based Autosegmentation



VARIAN | A partner for life
medical systems

Smart Segmentation™

Velocity

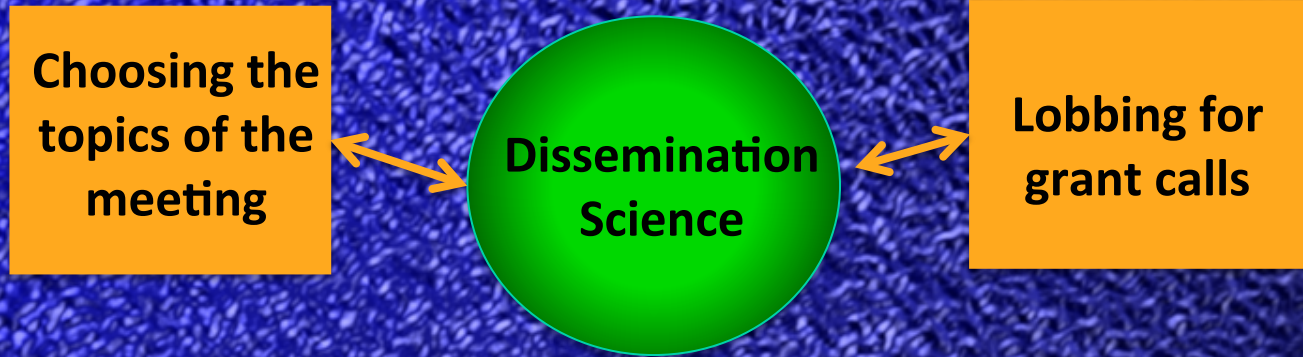
- Automated Anatomical Segmentation
- Deformable atlas-based segmentation
 - Advanced contouring platform
 - Automated PET contouring

ESTRO Scientific Plan

Choosing the
topics of the
meeting

Dissemination
Science

Lobbing for
grant calls

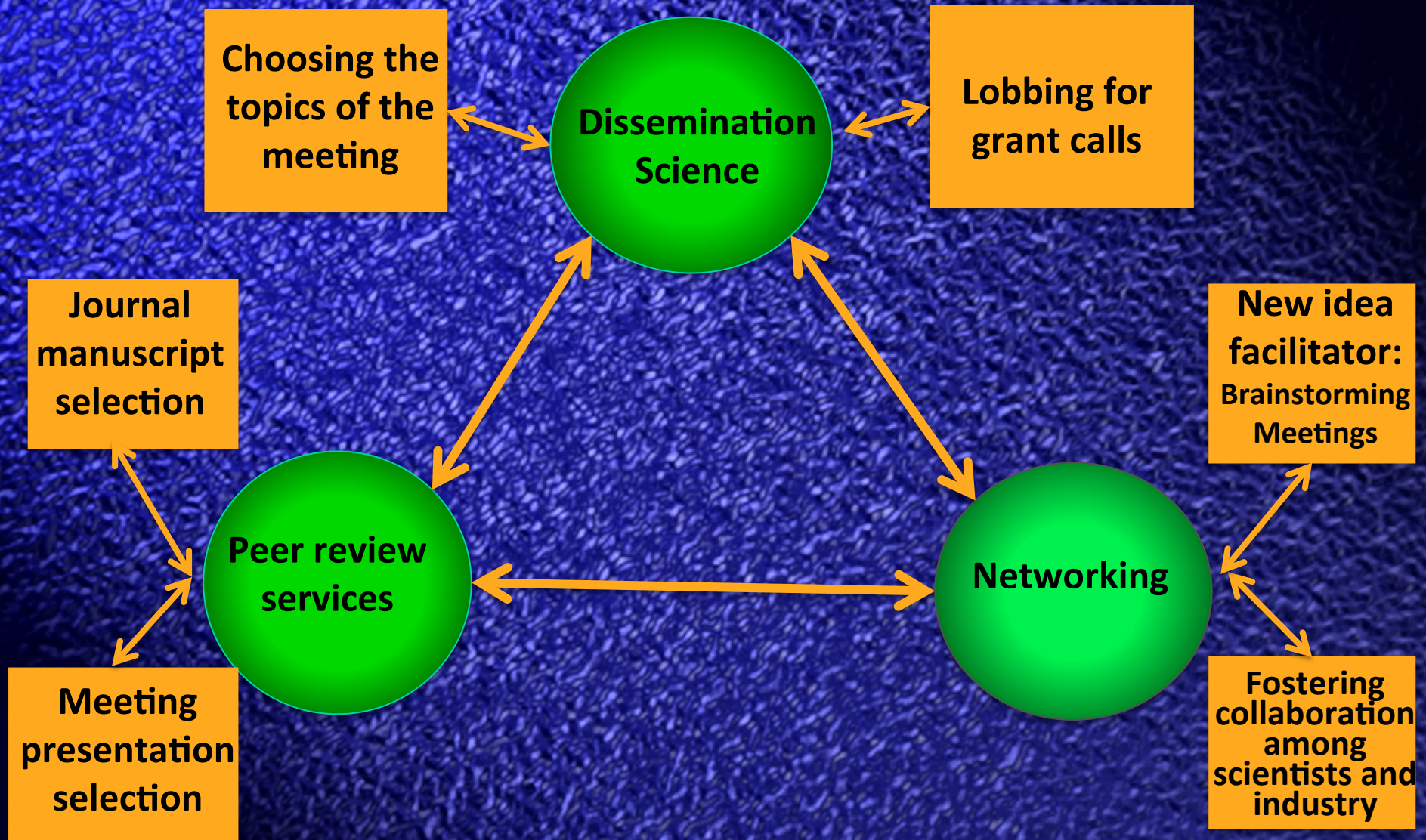


Topics for ESTRO 33

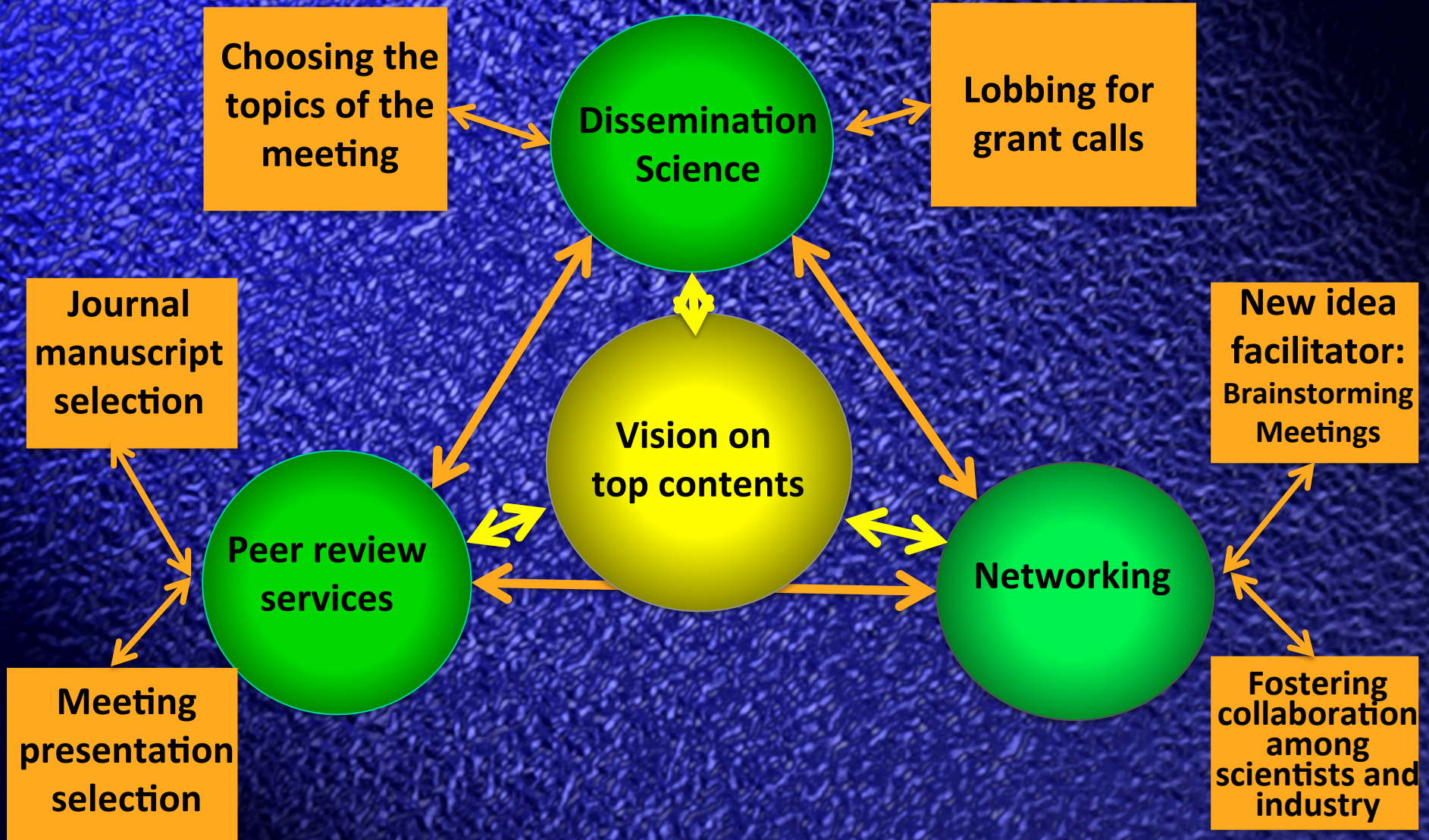
- The integration of new clinical and preclinical evidence from biology, molecular/functional and anatomic imaging in Radiation Oncology
- The physical and biological optimisation of radiation therapy
- The use of new systemic agents together with the delivery of high precision radiation therapy in a safety aware environment
- Combined-modality treatment using radiation and either cytotoxic and/or targeted therapeutics
- The use of high-precision radiotherapy used with curative intent in patients with metastatic and locally recurrent disease
- New developments in radiation oncology that further improve the safety of high-precision radiotherapy
- New approaches to adaptive radiotherapy integrating novel developments in biology, imaging, technology, and the assessment of tumour response and patient outcome
- The potential future use of novel biological modifiers of tumour and normal tissue response
- The development of validated predictive models of treatment outcome based on complex databases comprising clinical, biologic, genetic, imaging, dosimetric and population data
- Quality programmes, including clinical audit and comprehensive safety systems in Radiation and Clinical Oncology that maintain the principles of providing the highest quality of patient care and treatment in a safety-aware environment
- Health services research in radiotherapy and oncology, including the long term analysis of changes in specialist staffing in the discipline, the level of equipment, the appropriate implementation of new technology, patient access to new treatment approaches; together with the critical analysis of these strategic developments using cost-benefit, cost- utility and other means of health economic review and health technology assessment
- Clinical trials (phase 0, I, II, and III) in radiotherapy and combined modality



ESTRO Scientific Plan



ESTRO Scientific Plan



ESTRO Vision

Vision 1.2 related priority

- New approaches to adaptive radiotherapy integrating novel developments in biology, imaging, technology, and the assessment of tumour response and patient outcome.
- Innovative research and development on the potential future use of novel biological modifiers of tumour and normal tissue response.
- The development of validated predictive models of treatment outcome based on complex databases comprising clinical, biologic, genetic, imaging, dosimetric and population data.
- The continued development of quality programmes, including clinical audit and comprehensive safety systems in Radiation and Clinical Oncology that maintain the principles of providing the highest quality of patient care and treatment in a safety-aware environment.



ESTRO
Mission, Vision and Ambition

Membership (individual + istitutional + dual + cooperate)

Education

Courses

On-line
Services

Travel Grant

**PROFESSIONAL
SUPPORT**

Standards
Guidelines
Recommendations

Core curriculum

Health Economic

National Society

Patient Advocacy

ONCOPOLICY

**Dissemination
of science**

R&O

conferences

Networking

Organisation / Governance and Economics

ESTRO
Mission, Vision and Ambition

Membership (individual + istitutional + dual + cooperate)

Education

Courses

On-line
Services

Travel Grant

**PROFESSIONAL
SUPPORT**

Standards
Guidelines
Recommendations

Core curriculum

Health Economic

National Society

Patient Advocacy

ONCOPOLICY

**Dissemination
of science**

R&O

conferences

Networking

Organisation / Governance and Economics

ESTRO
Mission, Vision and Ambition

Membership (individual + istitutional + dual + cooperate)

Education

Courses

On-line
Services

Travel Grant

**PROFESSIONAL
SUPPORT**

Standards
Guidelines
Recommendations

Core curriculum

Health Economic

National Society

Patient Advocacy

ONCOPOLICY

**Dissemination
of science**

R&O

conferences

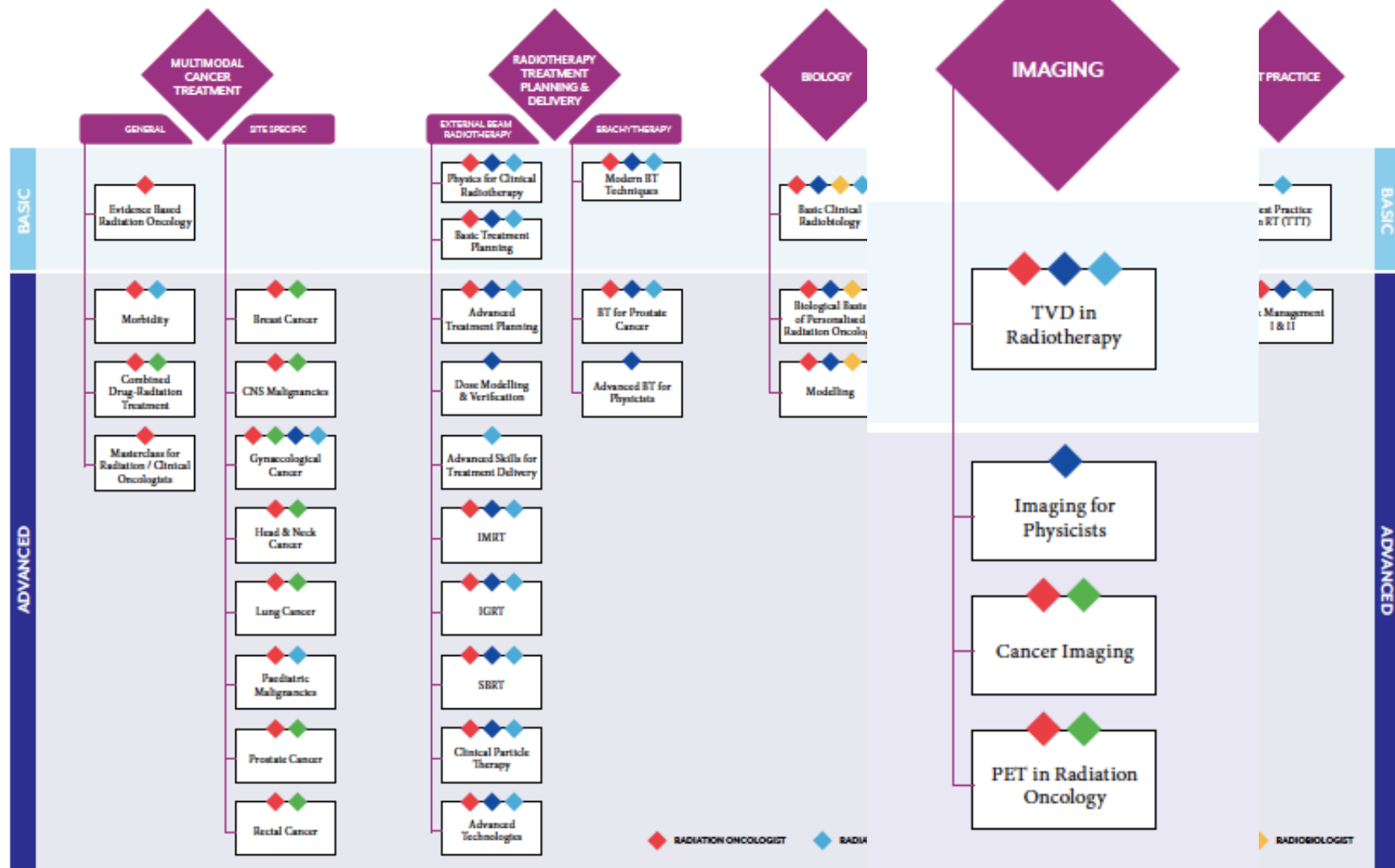
Networking

Organisation / Governance and Economics

ESTRO Courses Roadmap

WHICH COURSE TO ATTEND?

2014 Roadmap to Teaching Courses



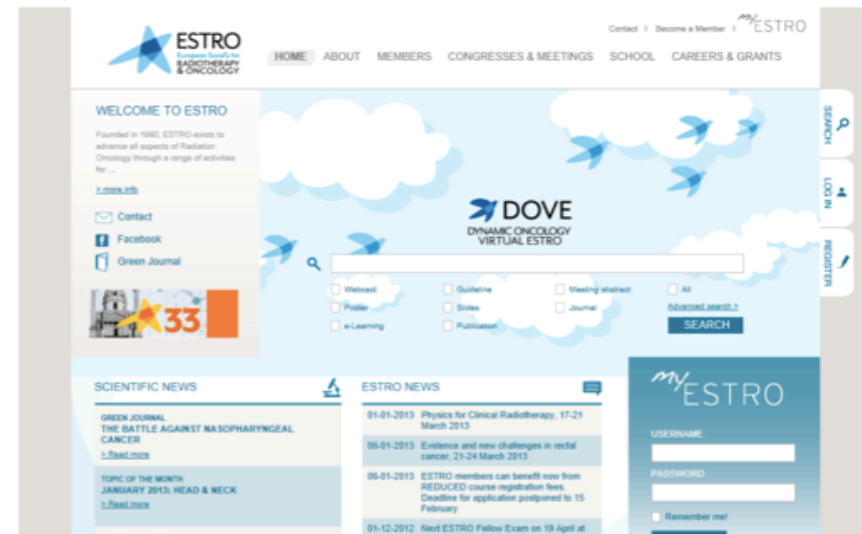
Falcon

The screenshot displays the EduCase web application interface. At the top, a Mozilla Firefox browser window shows the URL <http://estro.educase.com/cases/cntr.php?case=0e563a67dbc15947f894ff92d6b4dd54>. The application header includes the EduCase logo and navigation options. The main content area features a central CT scan image of the abdomen, with anatomical structures like the bladder and rectum highlighted in yellow and red. On the left, a 'Slices' panel shows a grid of thumbnail images labeled from Slice 53 to Slice 60. On the right, a 'Structures' panel lists 'Author's Structures' and 'Your Practice Structures', each with checkboxes and color-coded boxes for Bladder, Rectum, Fem Head Right, Fem Head Left, Intestines, and Body. The bottom of the browser window shows the Windows taskbar with the 'start' button and open applications like 'EduCase - VIE...' and 'Presentation1'.



New ESTRO website offers comprehensive online library of ESTRO educational and scientific material

- Access with single logon!
- Congress webcasts, e-posters and abstracts
- Course material
- Guidelines
- ESTRO newsletter
- Green Journal
- FALCON contouring cases
- Results EU projects





CURRENT SEARCH

Save

New

Results 1 - 10 of 763

Items Per Page ▼ Sort By ▼

 « First ‹ Previous Page **1** of 77 Next › Last »

REFINE YOUR SEARCH

Subject Filters

- ▶ Neoplasms (657)
- ▶ Therapy (593)
- ▶ Diagnosis (314)
- ▶ Drugs & Chemicals (204)
- ▶ Surgical (33)

Search Limits

- ▶ Content type
- ▶ Year
- ▶ Meeting location

 ORGAN PRESERVATION IN RECTAL CANCER 

C. Rödel

29th Annual Meeting of the European Society for Therapeutic Radiology and Oncology (ESTRO 2010), Barcelona - Spain

Abstract not available[...more]

 ADAPTIVE RADIOTHERAPY IN RECTAL CANCER: FUTURE OR FUTILE? 
C. Marijnen¹¹LEIDEN UNIVERSITY MEDICAL CENTER, Leiden, Netherlands

ESTRO Anniversary Congress, London - UK

Abstract not received.[...more]

 Outcomes of unselected patients with pathologic T3N0 rectal cancer. 

 Hagen H Kennecke¹, Howard H Lim¹, Ryan R Woods¹, Colleen E CE McGahan¹, John J Hay¹, Manoj J MJ Raval¹, Balvinder B Johal¹

CURRENT

- ▶ Select a
- ▶ Clear all
- ▶ View S
- ▶ Save S



Organ Preservation in Rectal Cancer

Prediction/ Selection:

- **T1/2, early T3**

- APR required
- Apoptosis prone,
low EGFR, TS

Treatment Optimization:

- **5-FU** CRT
- RT-dose **> 50 Gy**
(contact, IMRT, boost)



ESTRO
Mission, Vision and Ambition

Membership (individual + istitutional + dual + cooperate)

Education

Courses

On-line
Services

Travel Grant

**PROFESSIONAL
SUPPORT**

Standards
Guidelines
Recommendations

Core curriculum

Health Economic

National Society

Patient Advocacy

ONCOPOLICY

**Dissemination
of science**

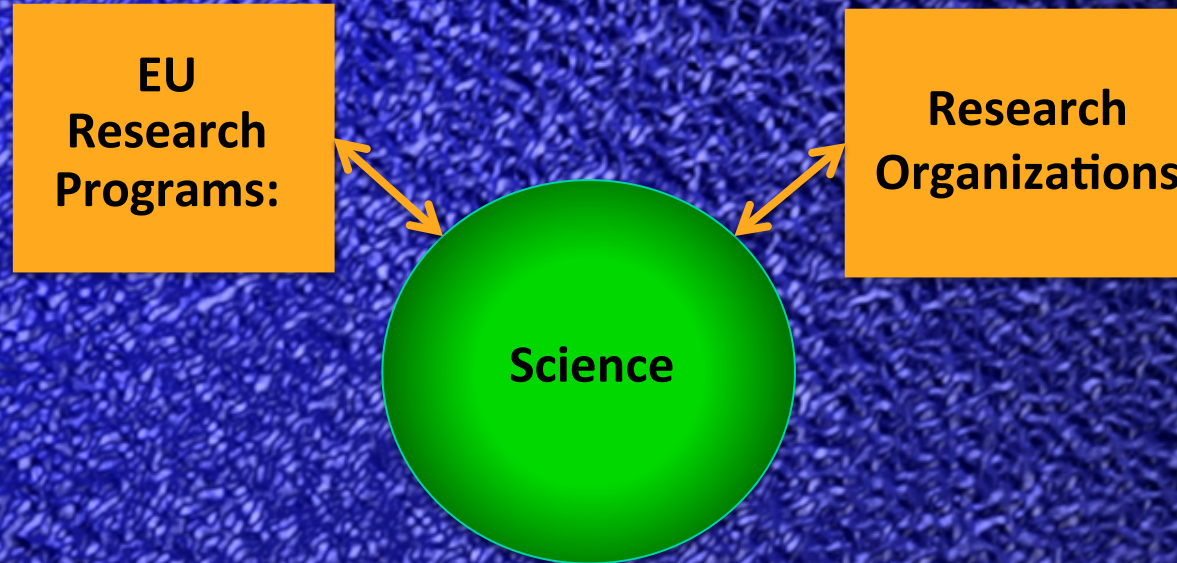
R&O

conferences

Networking

Organisation / Governance and Economics

ESTRO Oncopolicy





Horizon 2020 is **the next EU Framework Programme for Research and Innovation (2014 – 2020)**

Financial instrument implementing the **EU's growth strategy** for the coming decade, **aimed at securing Europe's global competitiveness.**

EU growth **strategy pillars:**

- ✓ RESPONDING TO THE ECONOMIC CRISIS,
- ✓ ADDRESSING PEOPLE CONCERNS,
- ✓ STRENGTHENING THE EU GLOBAL POSITION



EUROPEAN INSTITUTE
FOR BIOMEDICAL
IMAGING RESEARCH

ABOUT

The European Institute for Biomedical Imaging Research (EIBIR) is a non-profit limited liability company that was founded in 2006 by the European Society of Radiology (ESR), dedicated to the coordination of research.

EIBIR aims to coordinate and support the development of biomedical imaging technologies and the dissemination of knowledge with the ultimate goal of improving the diagnosis, treatment and prevention of disease.

The platform supports research networking activities and plays a key role in spreading good practice, promoting common initiatives and interoperability in the field of biomedical imaging research.



EUROPEAN INSTITUTE
FOR BIOMEDICAL
IMAGING RESEARCH

Shareholders

EIBIR's co-shareholders are represented at the General Meeting, where major strategic decisions are taken and recommendations are developed for EIBIR's other bodies and initiatives. Each shareholder organisation is also invited to nominate a representative to stand on EIBIR's Scientific Advisory Board.






EUROPEAN INSTITUTE
FOR BIOMEDICAL
IMAGING RESEARCH

Joint Initiatives

EIBIR currently supports five Joint Initiatives which represent interdisciplinary groups working towards a common biomedicine-focused research goal.

Specific activities within the Joint Initiatives include the initiation and coordination of collaborative research efforts, organisation of workshops and symposia, training and education of young scientists through exchange programmes and summer schools, and sharing of state-of-the-art equipment.


 **Biomedical Image
Analysis Platform**

 **EuroAIM**

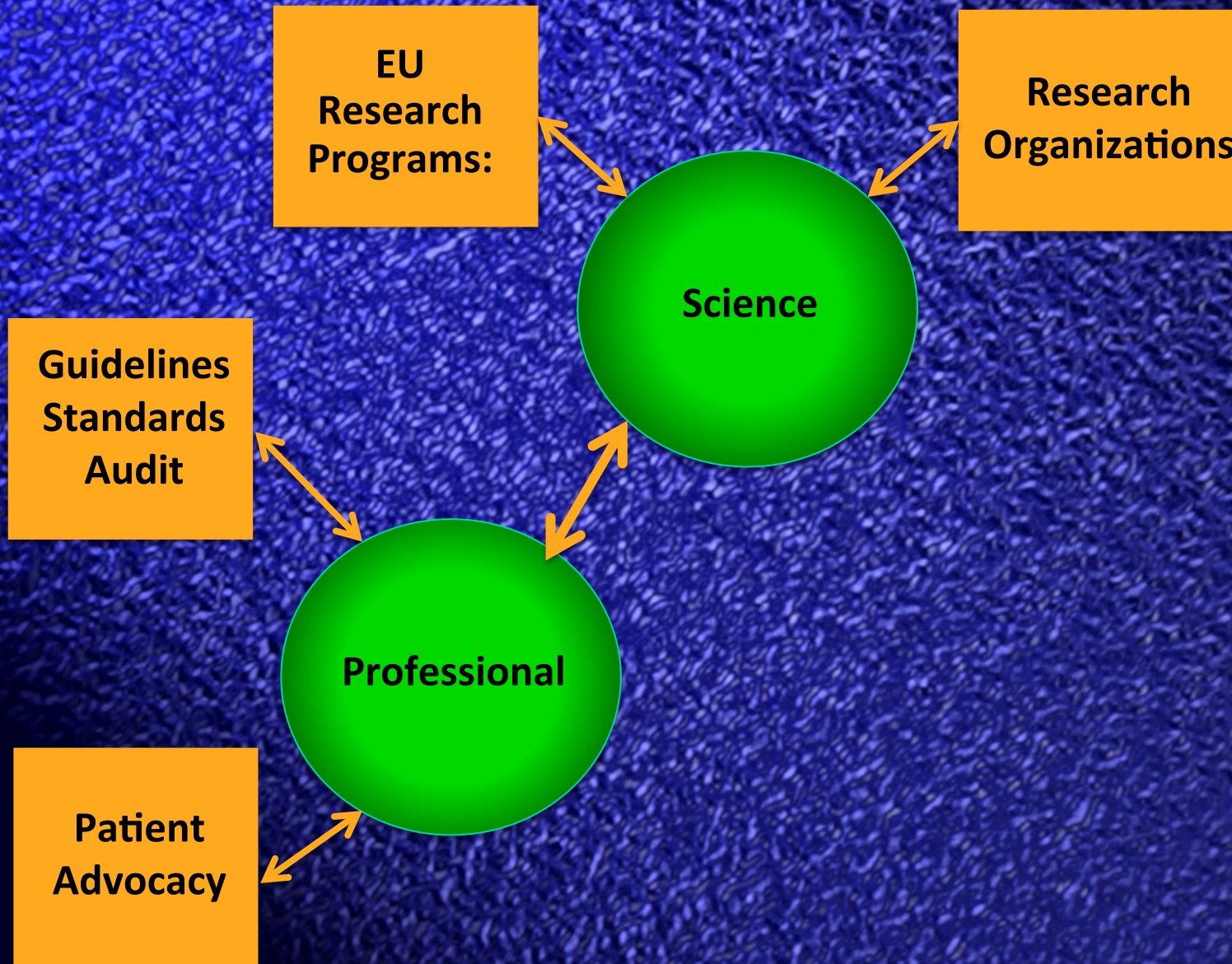
 **Cancer Imaging Group**

 **Chemistry Platform**

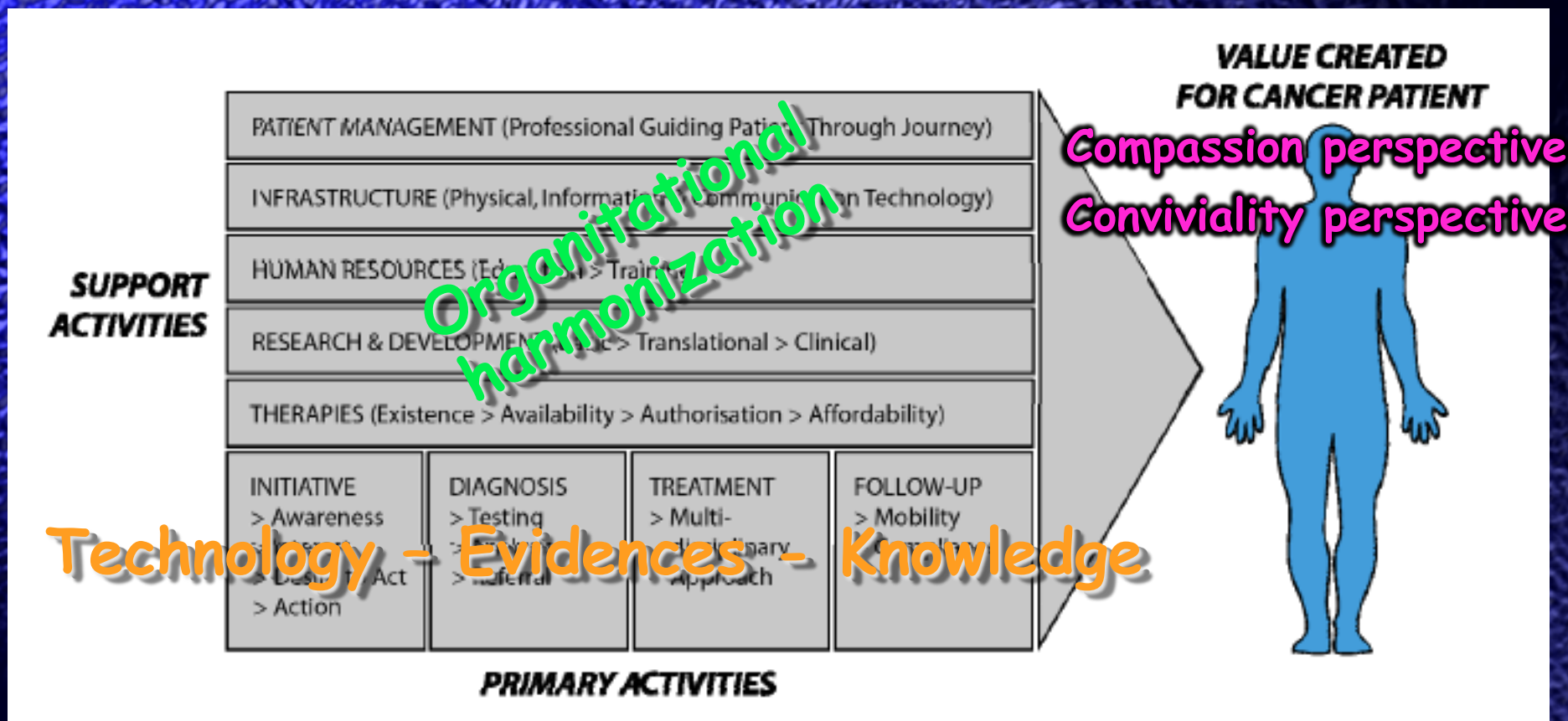
 **Cell Imaging Network**

 **Image-guided
Radiotherapy**

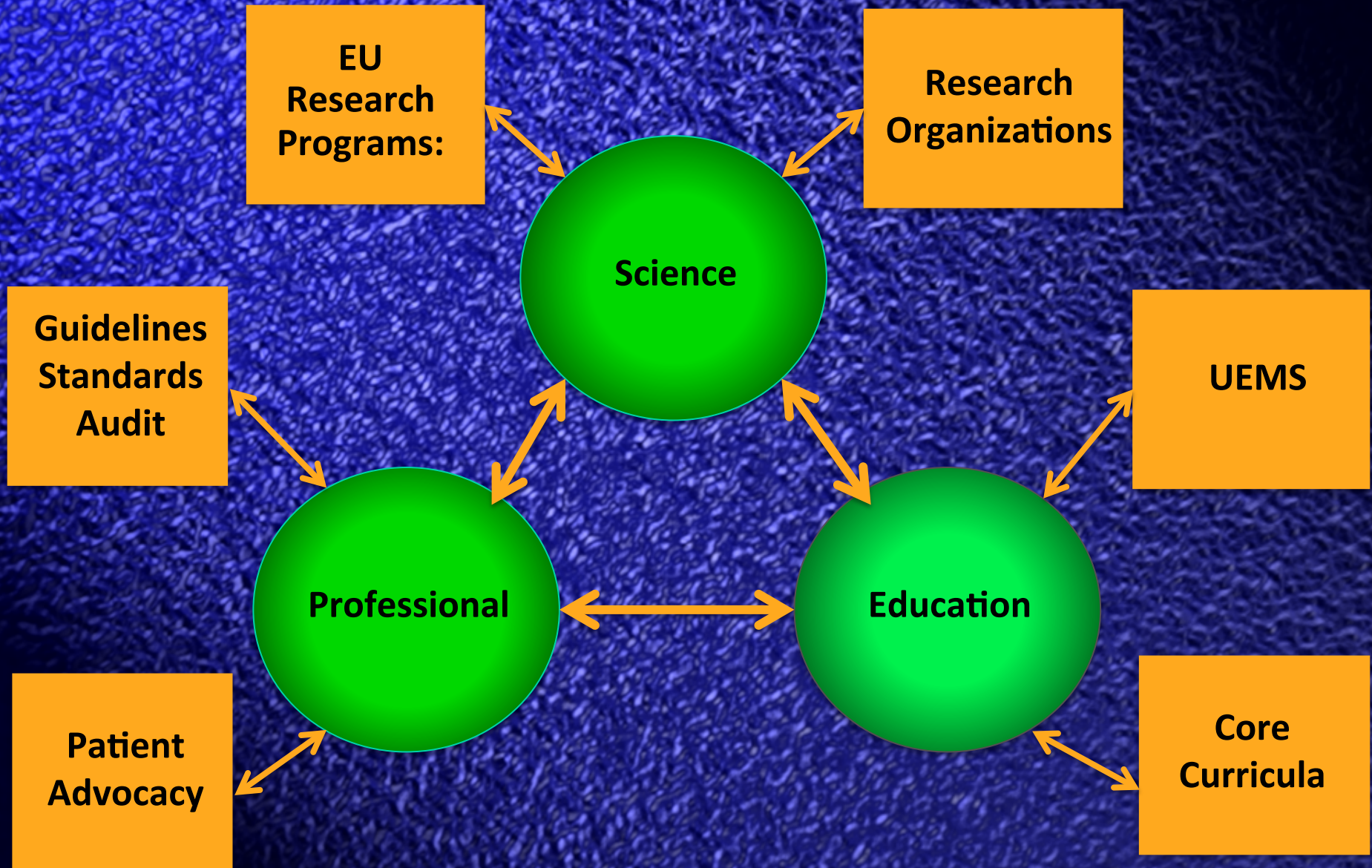
ESTRO Oncopolicy



The patient journey



ESTRO Oncopolicy



UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

5.2.3 Radiotherapy

Doc – Radiotherapy

Prof. Eriksen (*S. Radiotherapy*) presented the European Training Requirements in Radiotherapy-Radiation Oncology.

He stated that the document had been elaborated in close co-operation with the European Society of Radiotherapy and Oncology (ESTRO).

The Document “European Training Requirements in Radiotherapy-Radiation Oncology” (UEMS 2013/20) was adopted.



UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

5.3.5 Change of name of the UEMS Section of “Radiotherapy” into “Radiation Oncology”

Doc – Radiotherapy2

Prof. Eriksen (*S. Radiotherapy*) presented a request to change the name of the Section in order to better reflect the current scope of practice of the specialty at the European level.

Concerns were raised as to whether the title of the UEMS Specialist Section should reflect the title of speciality as listed in annex 5.1.3 if the EU Directive on Professional Qualifications Directive (2005/36/EC) and recognised by EU Member States.

Dr Borman (*UEMS Secretary General*) suggested to amend the title of the Section into “Radiotherapy and Radiation Oncology”.

The Council decided to change the name of the Section into “Section of Radiotherapy and Radiation Oncology” (21 for, 1 against, 1 abstention).

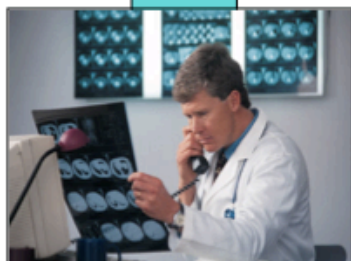


THERAGNOSTIC PARADIGM

BEFORE

TREATMENT

AFTER



- Diagnosis
- Staging
- Target volumes
- Planning

In room imaging (IGRT_{p.d.})

Off-line / On-line

Theragnostic Imaging

(biologically adapted prescription)

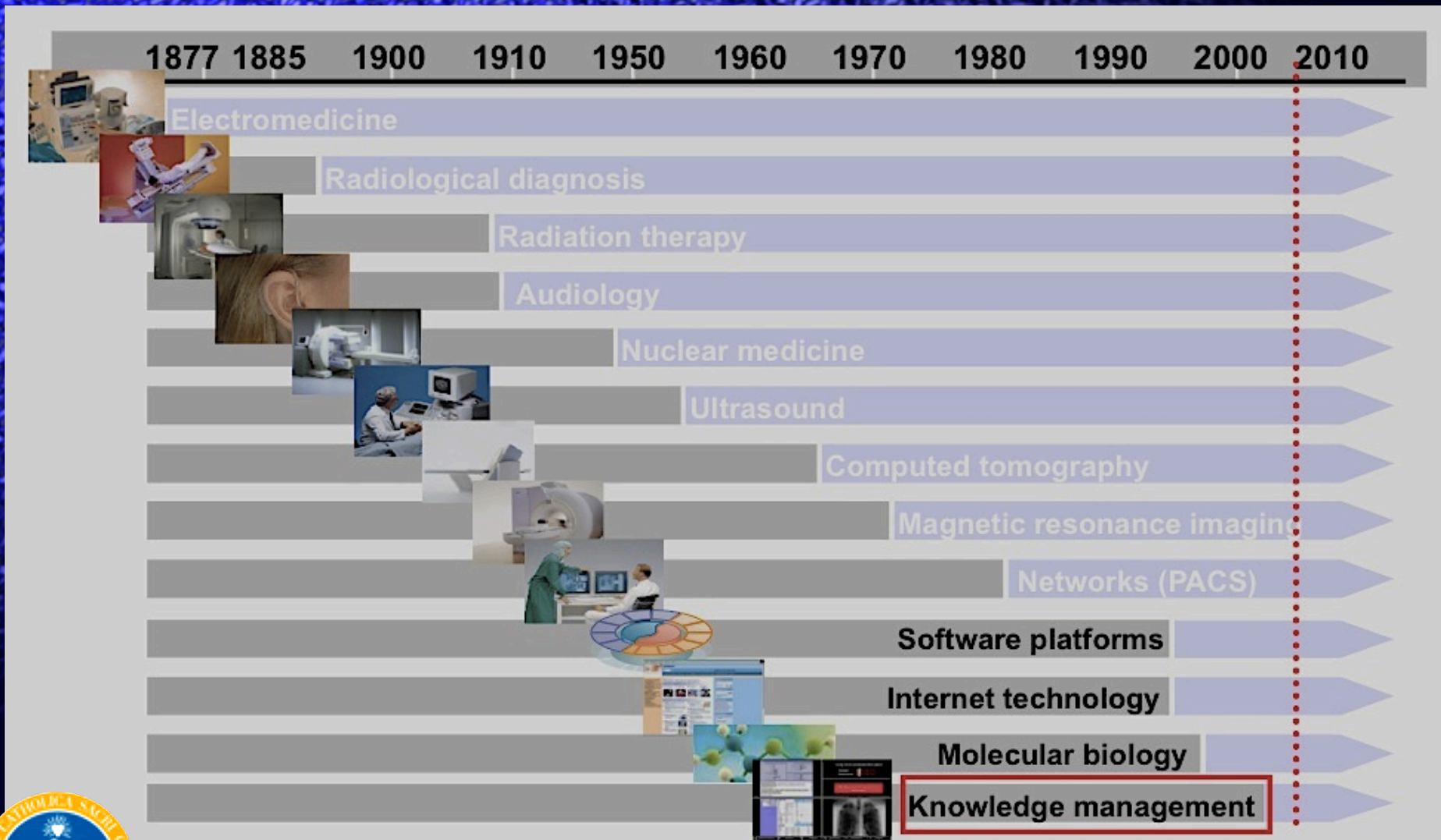
- Early toxicity



en M. Bentzen – modif. , 2006

Bentzen S – Lancet Oncology - 2005

Knowledge Based Technology

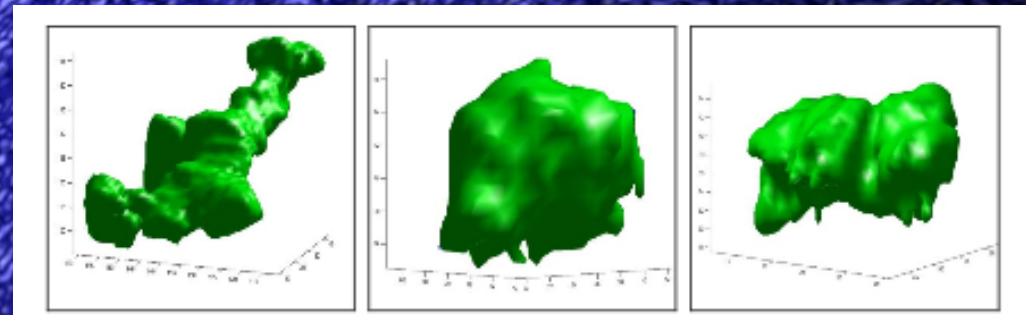


Radiomics: Imaging Feature Extraction

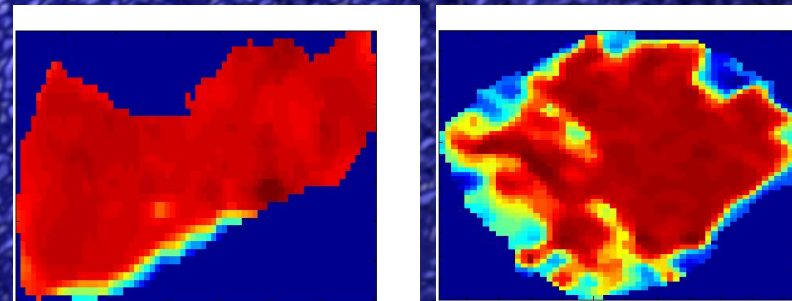
First order statistics



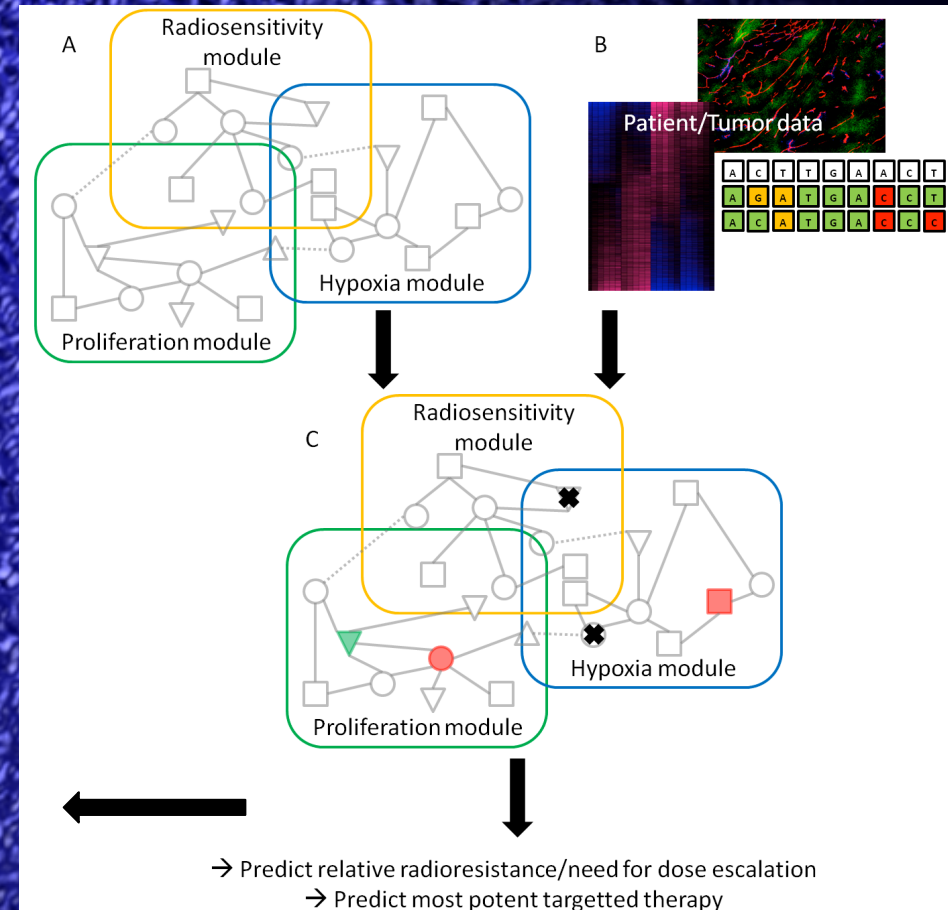
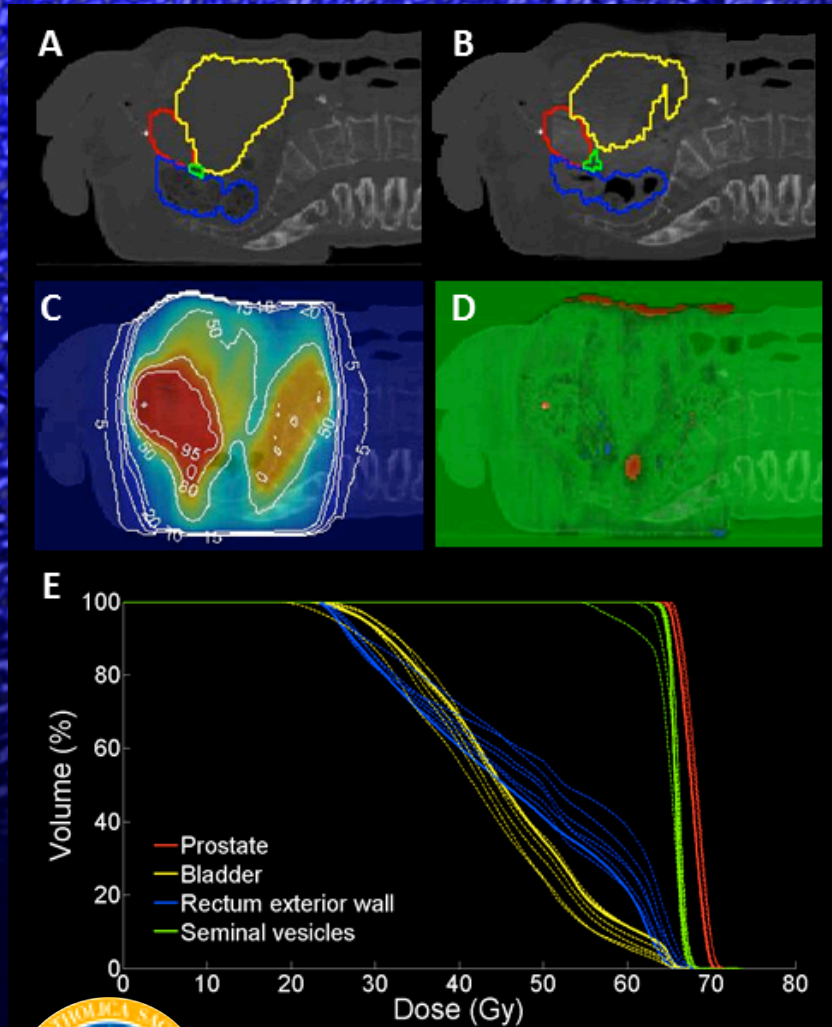
Shape based features



3D texture analysis

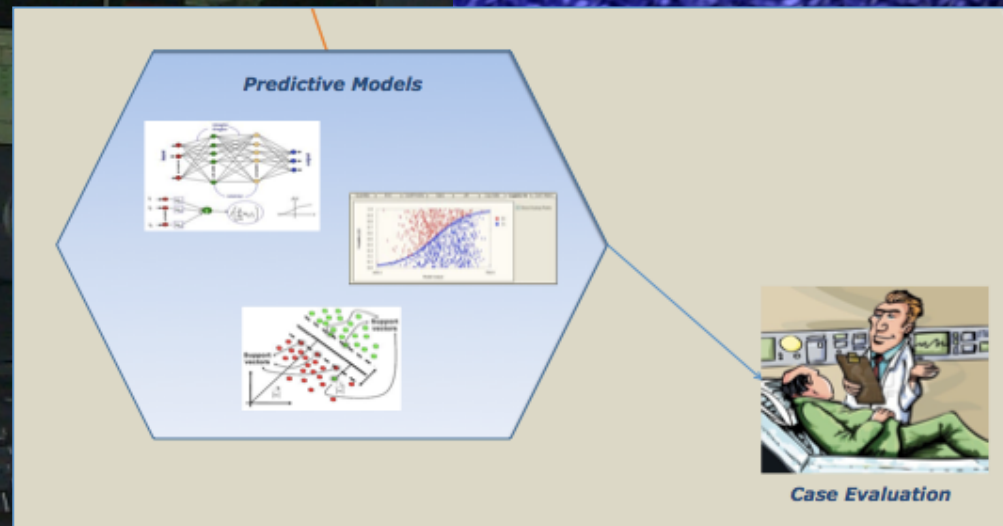
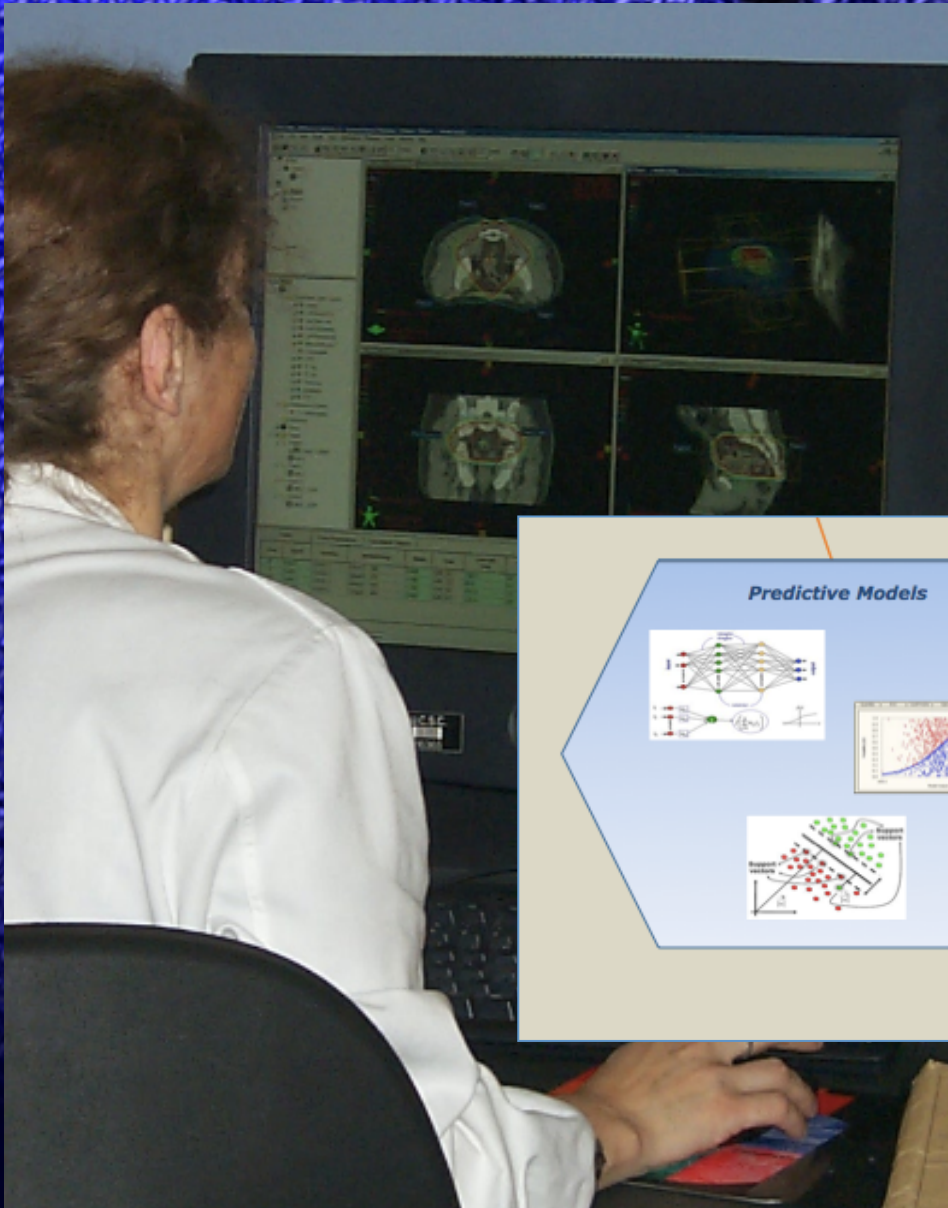


Radiomics: Imaging Feature Extraction



Lambin P, V.Valentini et Al - Nature Review – in press

VATE Project aim

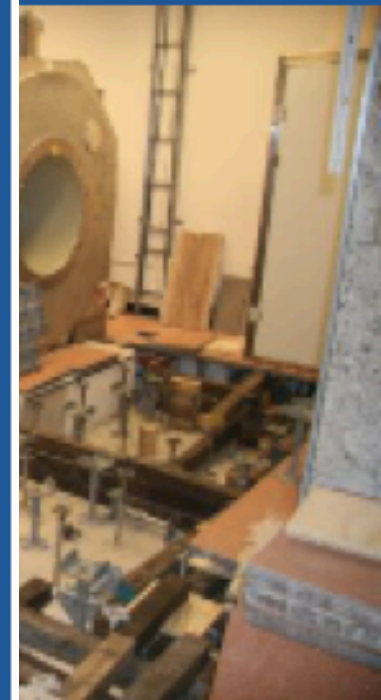
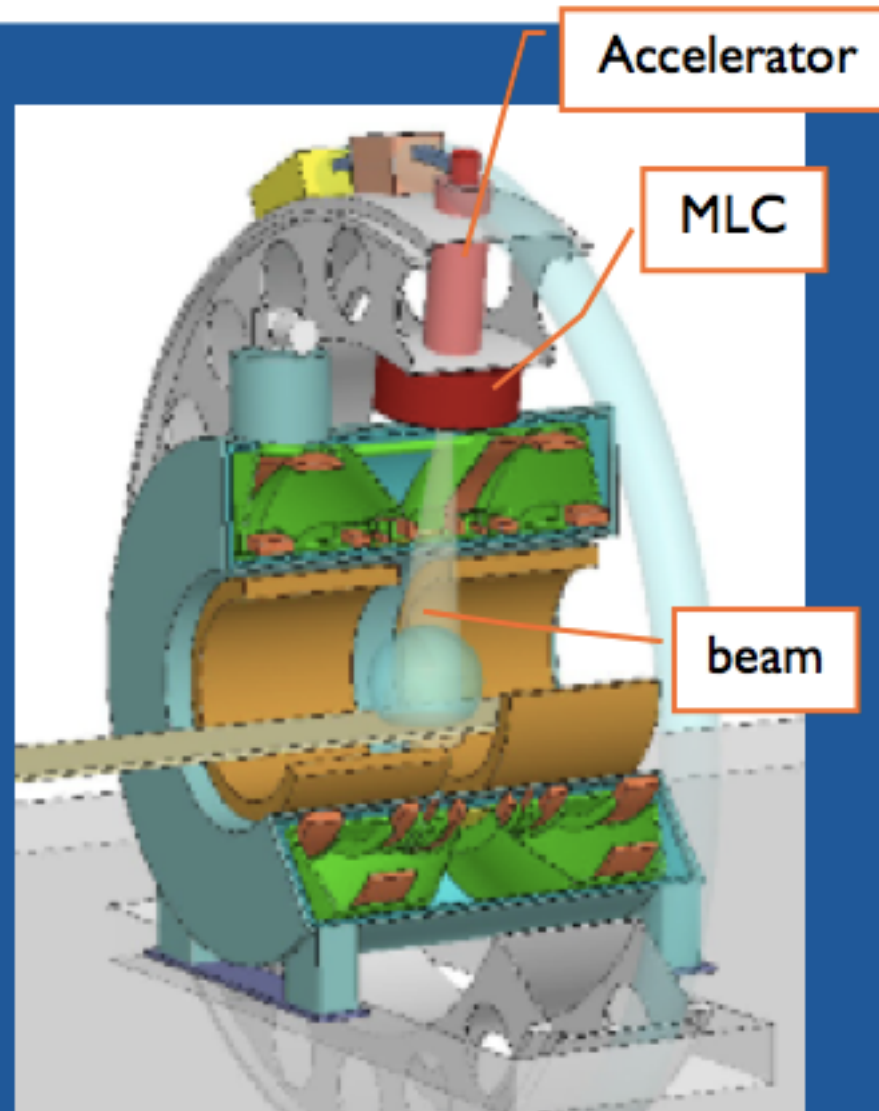


Linac MRI

System on site at Utrecht University

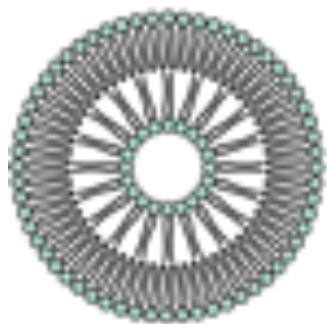
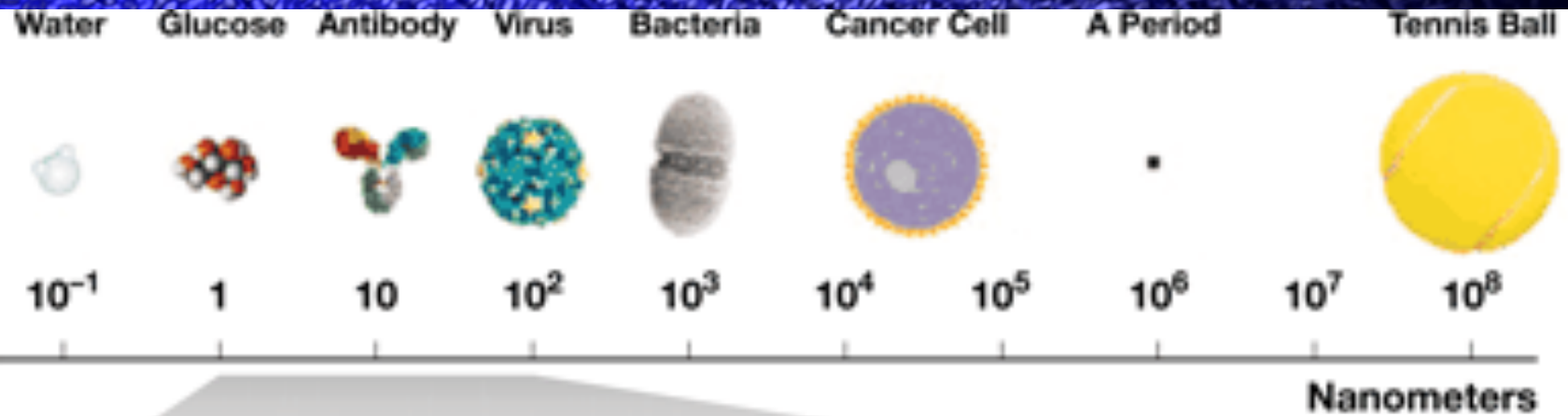


Prototype magnet
Magnex Scientific



position

Nanoparticle issue



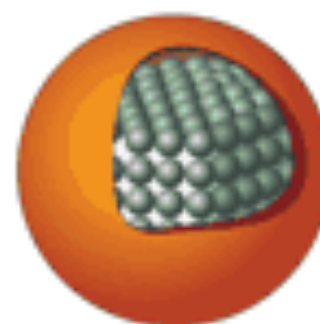
Liposome



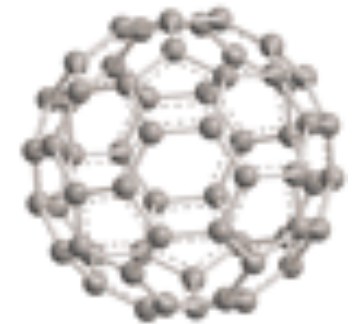
Dendrimer



Gold Nanoshell

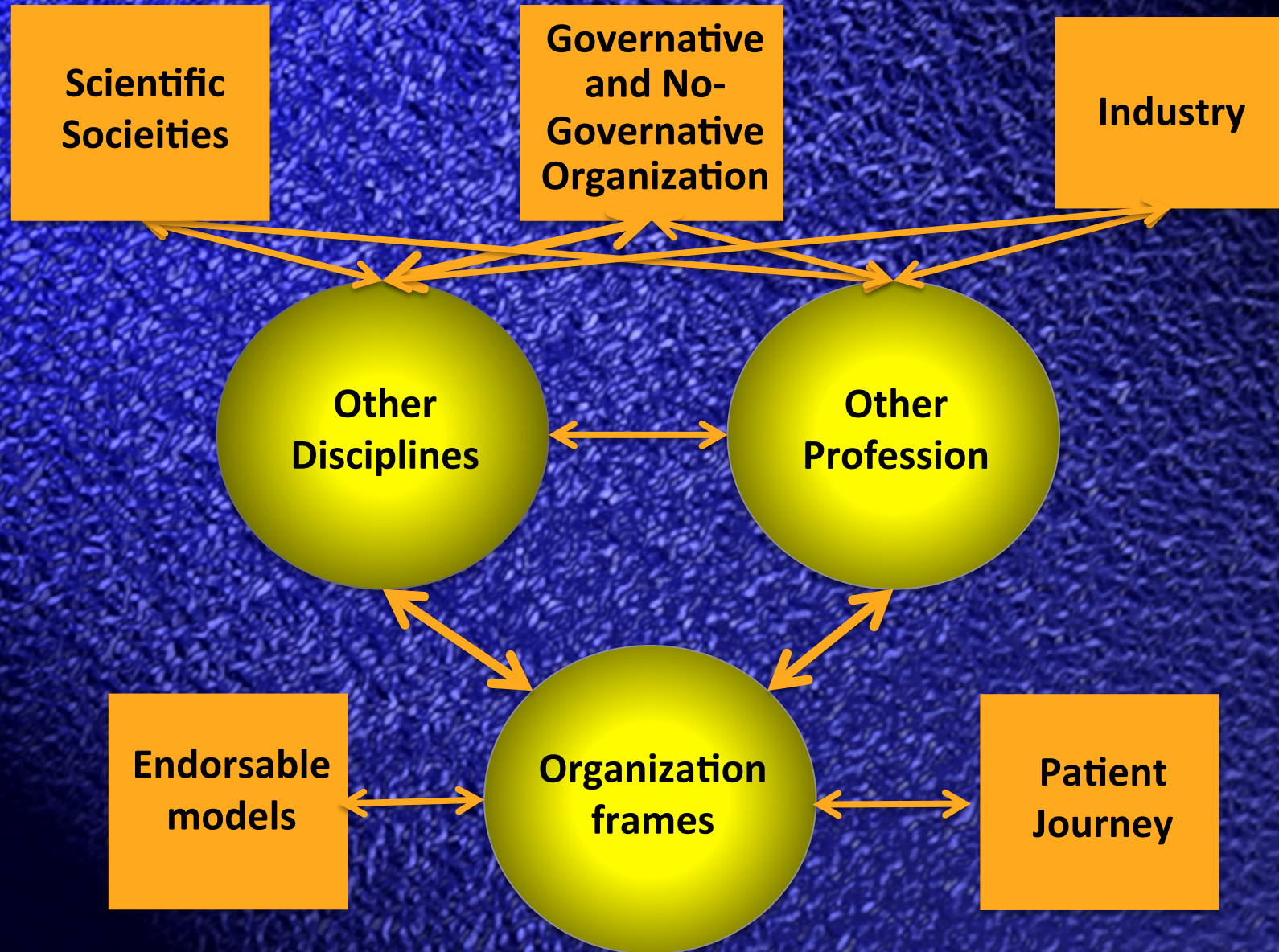


Quantum Dot



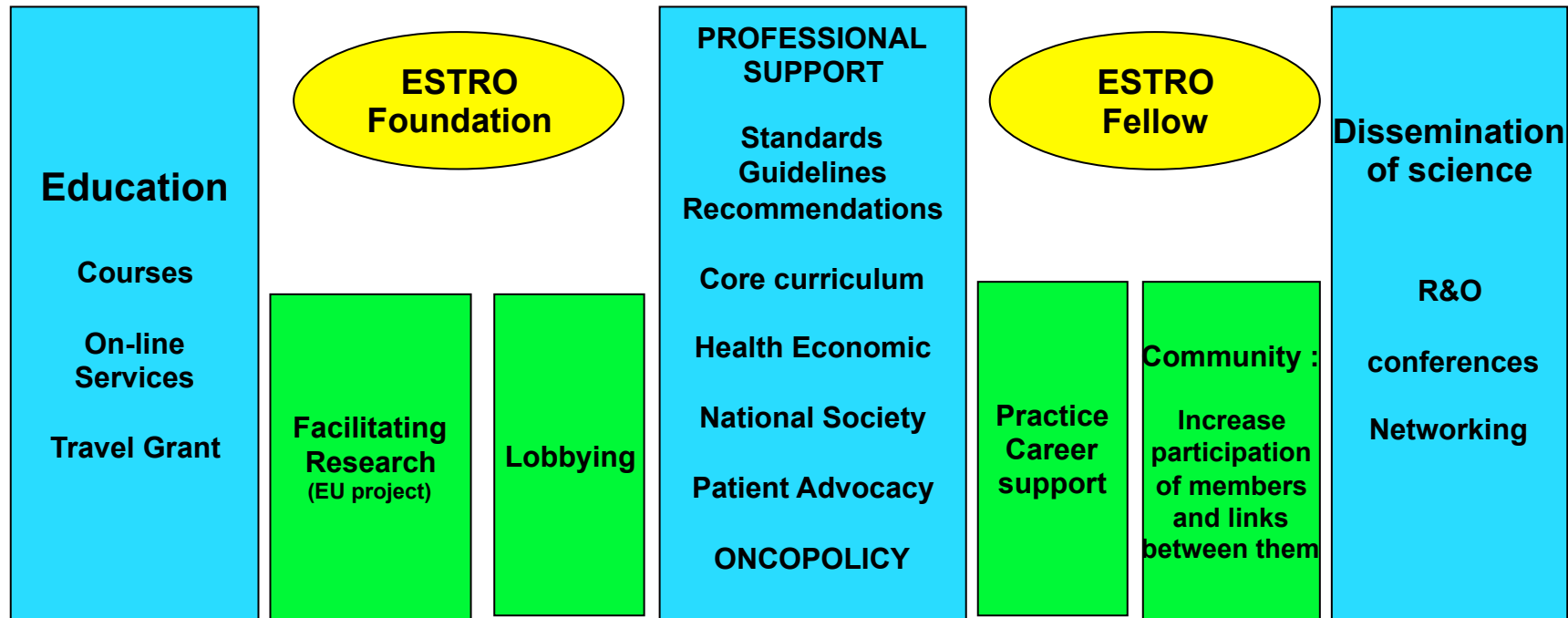
Fullerene

ESTRO Multidisciplinarity



ESTRO
Mission, Vision and Ambition

Membership (individual + istitutional + dual + cooperate)



Organisation / Governance and Economics

Young needs



- **Professional career**

- Certification, education
- Expertise
- Networking
-



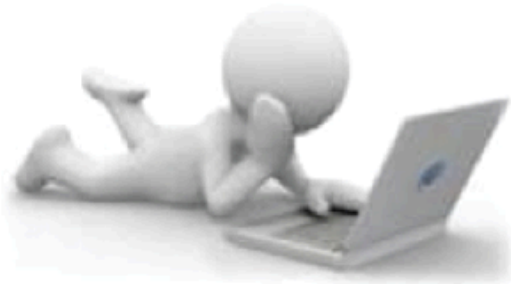
- **ESTRO answers**

- Courses, DOVE, GJ
- Job Posting
- Mobility Grants TTG

Comment from Ytf: ESTRO support for education (online and live) is very helpful



Young needs



- **Research support**
 - Science networking
 - Brain storming
 - Publication opportunities
 -



- **ESTRO answers**

- Meetings
- Green Journal
- Mobility grants TTG
- Research projects

Comment from Ytf: meetings, green journal and TTG are very important, but research support is still limited



Young needs



- **ESTRO engagement**

- Function understanding, leadership training
- Access to structure
- Recruitment for service
-



- **ESTRO answers**

- Agorá
- Newsletter
- Fellow

Comment from Ytf: Agorá meeting is very important, but fellowship needs improvement



CONSENSUS IURIS

*Se in una **Società** manca il **patto fondativo dei diritti**, non solo non si dà **giustizia**, ma **viene meno anche il popolo** come pluralità ordinata e armonica di persone, e viene meno anche la Società perchè **Essa non c'è** se non è fondata sul **riconoscimento dei diritti individuali** e quindi sulla **giustizia**.*

