XIX Assemblea Plenaria Italy-Japan Business Group

Tokyo, 13 giugno 2007

The challenge of Biotechnologies
Executive Summary

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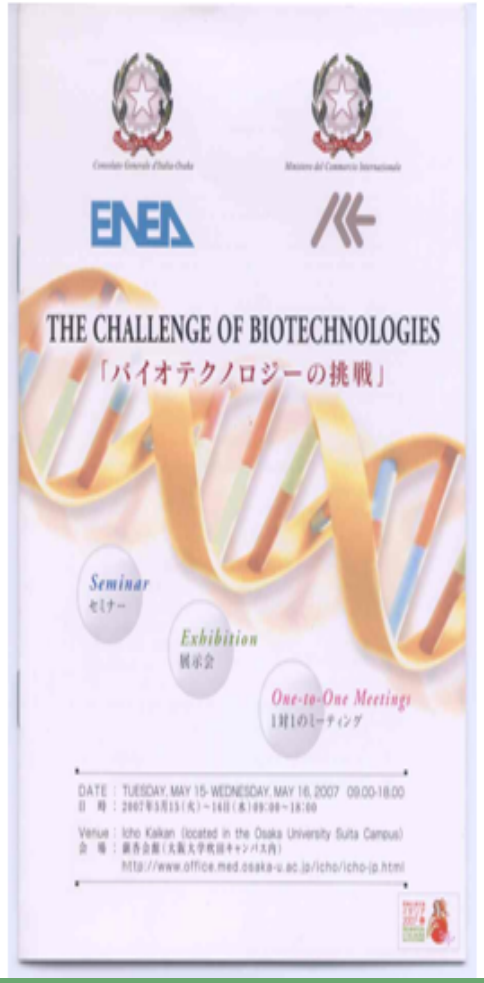
ENEA CR Casaccia
Rome (Italy)



日本における
イタリア
2007・春
PRIMAVERA
l'ITALIANA
ITALIA IN GIAPPONE

ENEA

Consolato Generale d'Italia-Osaka

Ministero del Commercio Internazionale

"ITALIAN SPRING IN JAPAN"

http://primavera-italiana.net

THE CHALLENGE OF BIOTECHNOLOGIES

「バイオテクノロジーの挑戦」

Seminar	*Exhibition*	*One-to-One Meetings*
セミナー	展示会	1対1のミーティング

DATE: TUESDAY, MAY 15- WEDNESDAY, MAY 16, 2007 09.00-18.00
日時： ２００７年５月１５(火)～１６日（水）０９：００～１８：００
（０８：３０受付開始）

Venue: Icho Kaikan (located in the Osaka University Suita Campus)
会場： 銀杏会館（大阪大学吹田キャンパス内）
http://www.office.med.osaka-u.ac.jp/icho/icho-jp.html

Organizers - 主催：
- Consulate General of Italy – Osaka 在大阪イタリア総領事館
- E.N.E.A. Italian National Agency for New Technologies, Energy and the Environment
  イタリア新技術・エネルギー・環境公団
- Ministero del Commercio Internazionale イタリア貿易省
- I.C.E. Italian Trade Commission イタリア貿易振興会

With the support of - 後援：
- Osaka Prefecture 大阪府
- Medical Center for Translational Research, Osaka University Hospital大阪大学医学部附属病院未来医療センター
- Osaka Chamber of Commerce & Industry 大阪商工会議所
- Kansai Economic Federation (Kankeiren) 関西経済連合会

A DOOR TO THE FUTURE

The Challenge of Biotechnologies

The workshop was organized by:

ENEA

Consolato Generale d'Italia – Osaka

Ministero del Commercio Internazionale – ICE Tokyo

Primavera Italiana in Giappone
The challenge of Biotechnologies
La sfida delle Biotecnologie
15-16 MAY OSAKA

- **Seminar**
  Agro-food
  Health
  Industrial Environmental Biotechnologies
- **Exhibition**
- **One-to-one Meetings**

Italian Participants

Coordinator: ENEA - Department Biotechnologies, Agroindustry and Health Protection

Italian National Committee for Biosafety, Biotechnology and Life Sciences CNBBSV

7 Universities : Bari and CIRCC, Milano Bicocca, Modena and Reggio Emilia, Napoli Federico II, Parma and TEFARCO, Rome Tor Vergata, Trieste

3 Institutes CNR - Agricoltural Biology and Biotechnology, Biochemistry of Proteins, Chemistry and Technology of Polymers

Italian National Institute of Health ISS

Sant'Anna School of Advanced Studies of Pisa

ICGEB -Trieste

Italian Suschem Technology Platform for Sustainable Chemistry

3 Regions:
Friuli Venezia Giulia - CBM S.c.r.l., Cluster in Biomedicine, Trieste
Emilia-Romagna Regional Network for Industrial Research, Innovation and Technology Transfer (ASTER)
Lombardia – CC di Milano PROMOS

Italian Participants

Companies:

- Syntech s.r.l.
- CPC Biotech s.r.l.
- ACS dobfar S.p.A.
- RESINDION S.r.l
- Dr. E.MARINICH SaS House of Tecnology
- MOLMED SPA

- IBIOCAT Italian Consortium for Research and Industrial application of Biocatalysis and Biotechnology

Agro-Food Biotechnology

- **Biosensors in food chain**
- Dr. Sabato D'Auria, National Research Council of Italy
  New recombinant bioinsecticides
- Prof. Rosa Rao – Università Federico II di Napoli **and**
- Prof. Kenji Matsui, Dept. Biological Chemistry, Faculty of Agriculture, Yamaguchi University
- **Genomics of fruit quality**
- Prof. Piero Tonutti - Sant'Anna School of Advanced Studies of Pisa
- **Polysaccharides gel and films: a natural approach to crop and foodprotection**
- Dr. Mario Malinconico, National Research Council of Italy
  Plant biopharmaceuticals
- Dr. Marcello Donini, Italian National Agency for New Technologies, Energy and the Environment ENEA -

ADVANCED OPTICAL BIOSENSORS AND BIOCHIPS FOR ANALYSES OF HIGH INTEREST FOR HEALTH AND FOOD SAFETY

Sabato D'Auria CNR - Napoli

- Prof. Toru Yoshimura – University of Nagoya

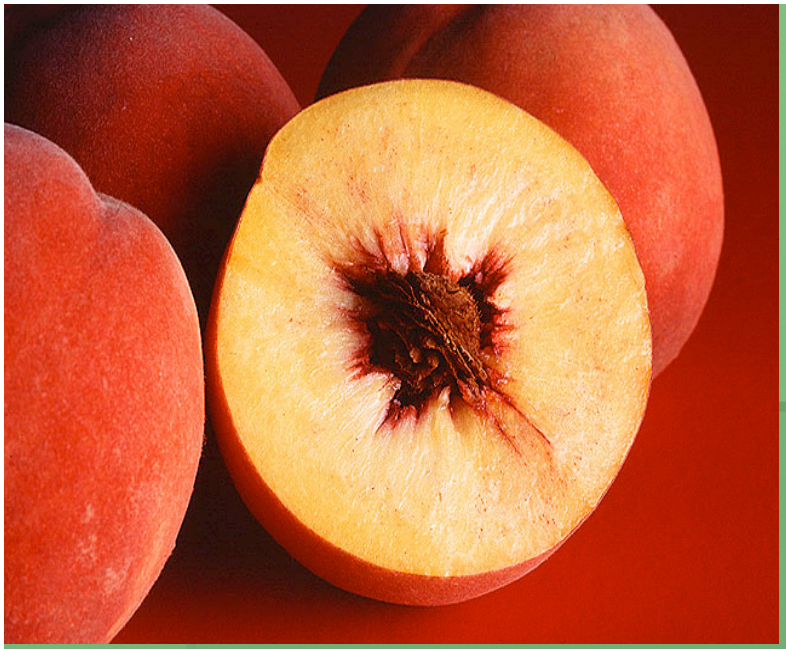
  Collaboration in the design of an optical biosensor for the diagnosis and follow-up of schizophrenia

GENOMICS OF FRUIT QUALITY

Genomics approaches and the development of high throughput technologies for large scale analyses of transcriptome and proteome are now becoming widely used in several labs- including that at the Sant'Anna School of advanced Sudies in Pisa- for unravelling the molecular mechanisms of fruit development and understanding the biological basis of fruit Quality.

The Italian Consortium for Genomics studies in peach fruit and Rosaceae family (ESTree Consortium, http://www.itb.cnr.it/estree) set up a specific database of EST (Expressed Sequence Tags) isolated from different peach fruit varieties, tissues, and developmental stages and isolated about 5,000 unigenes.

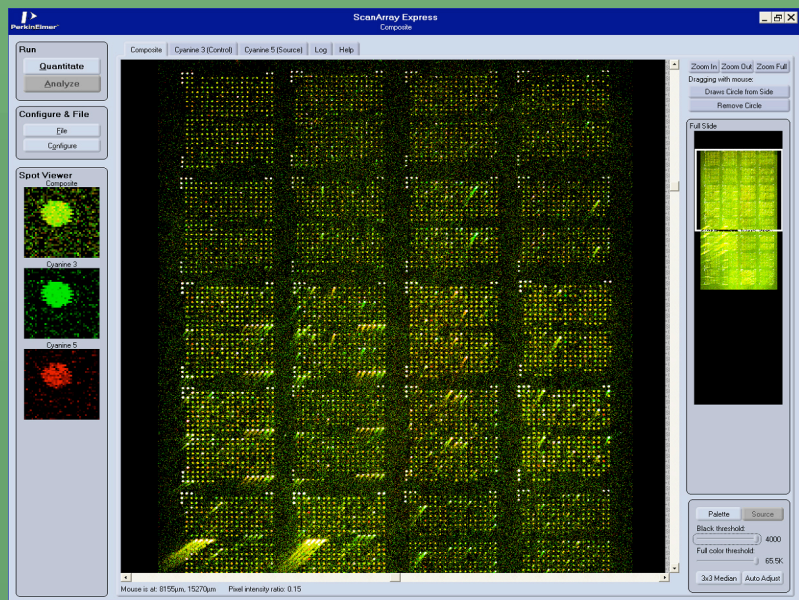
Specific oligos (70mer) for these unigenes have been synthesized and the first peach microarray (μPEACH1.0) assembled.



Quality parameters as nutritional (e.g. antioxidant activity, bioactive compounds) and organoleptic and hedonic properties (colour, taste, flavour, pulp texture, juiciness) are the result of metabolic changes occurring mainly during the ripening process.
Using the peach microarray, expression patterns of genes involved in these metabolic pathways are being studied.

This biotech approach allows to better understand how fruit quality parameters are influenced by endogenous and exogenous factors and to identify genes inìvolved (with a structural or regulatory function) in the evolution of quality-related parameters.
The peach microarray is also being usedfor comparative studies within the Rosaceae family (apricots, cherries, plums)

The µPEACH 1.0



Polysaccharides gel and films: a natural approach to crop and food protection

Mario Malinconico, CNR, Napoli

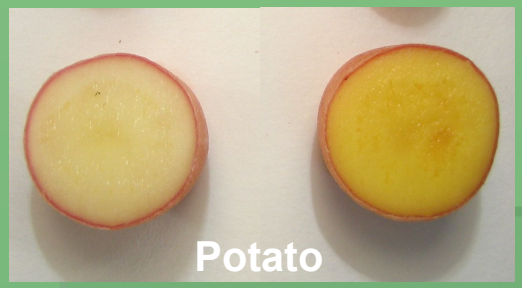
Collaboration with Adachi New Industrial Co., Osaka in the development of application of gel for fruit shelf-life preservation and application of metal sputtering to control water evaporation of polysaccharide films

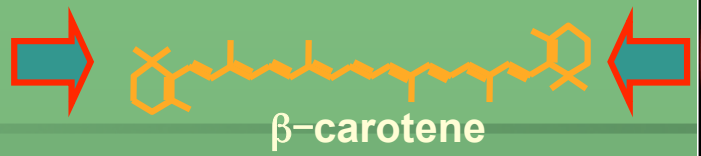
Spray black film on soil cultivation

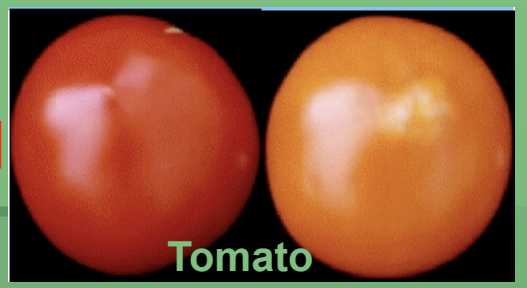
Department Biotechnologies, Agroindustry and Health Protection

Genetic engineering in ENEA

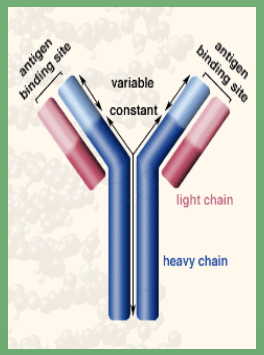
Production of “golden”variety to counteract A avitaminosis



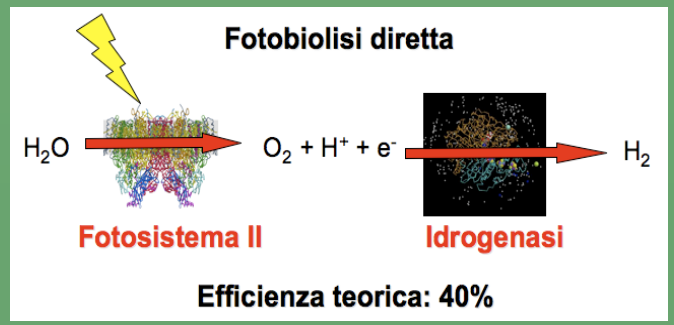




Production of antibodies and vaccins in plants

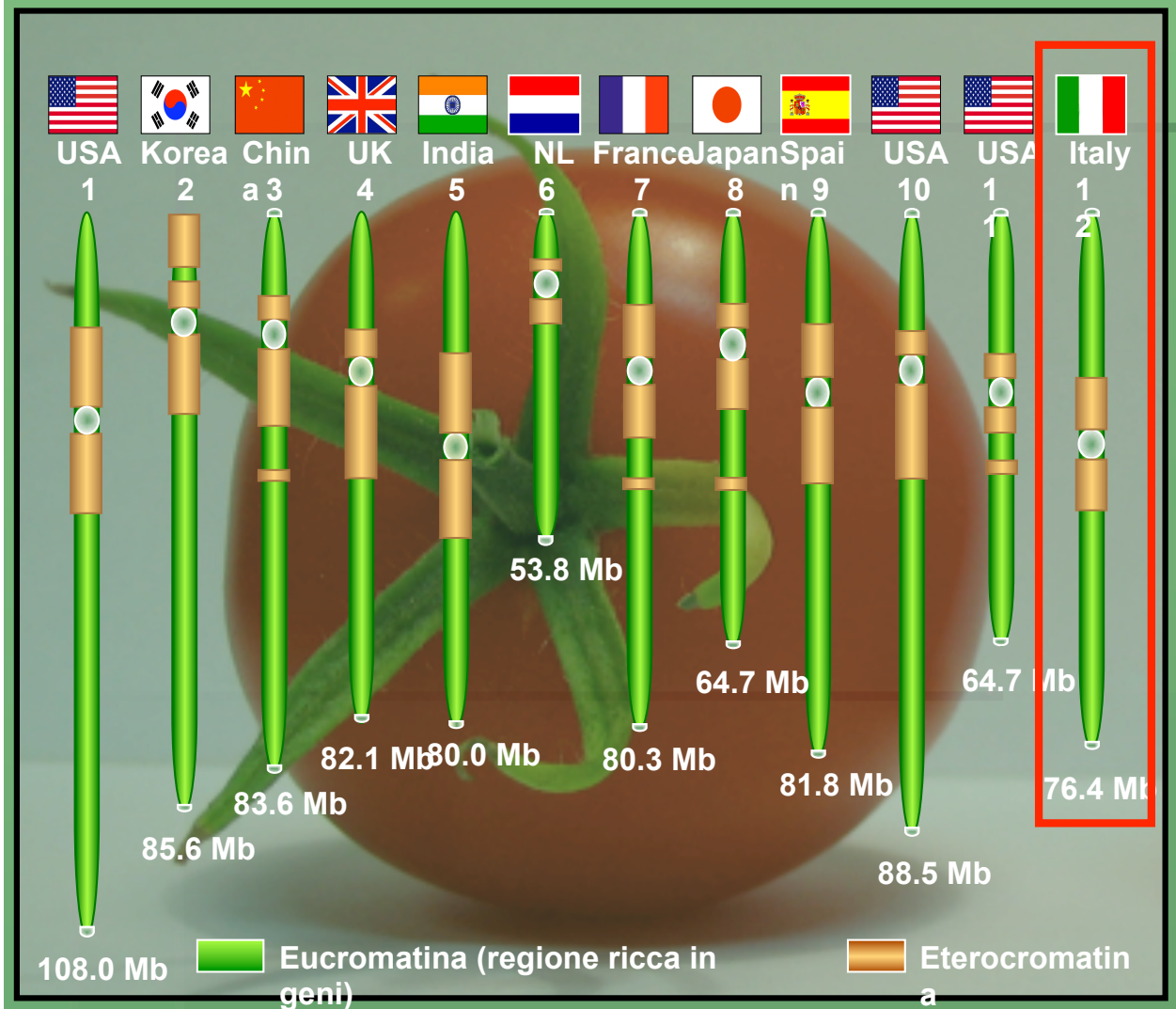


Hydrogen production from microalgae



L'ENEA as a "player" in vegetal genomics

Tomato genome sequencing (international cooperation)



Orphan genomes sequencing

Fiore di zafferano. La freccia indica la parte commestibile (stigmi)

Plants as expression system of molecules of biopharmaceutical interest

1. 'Pl'antibodies

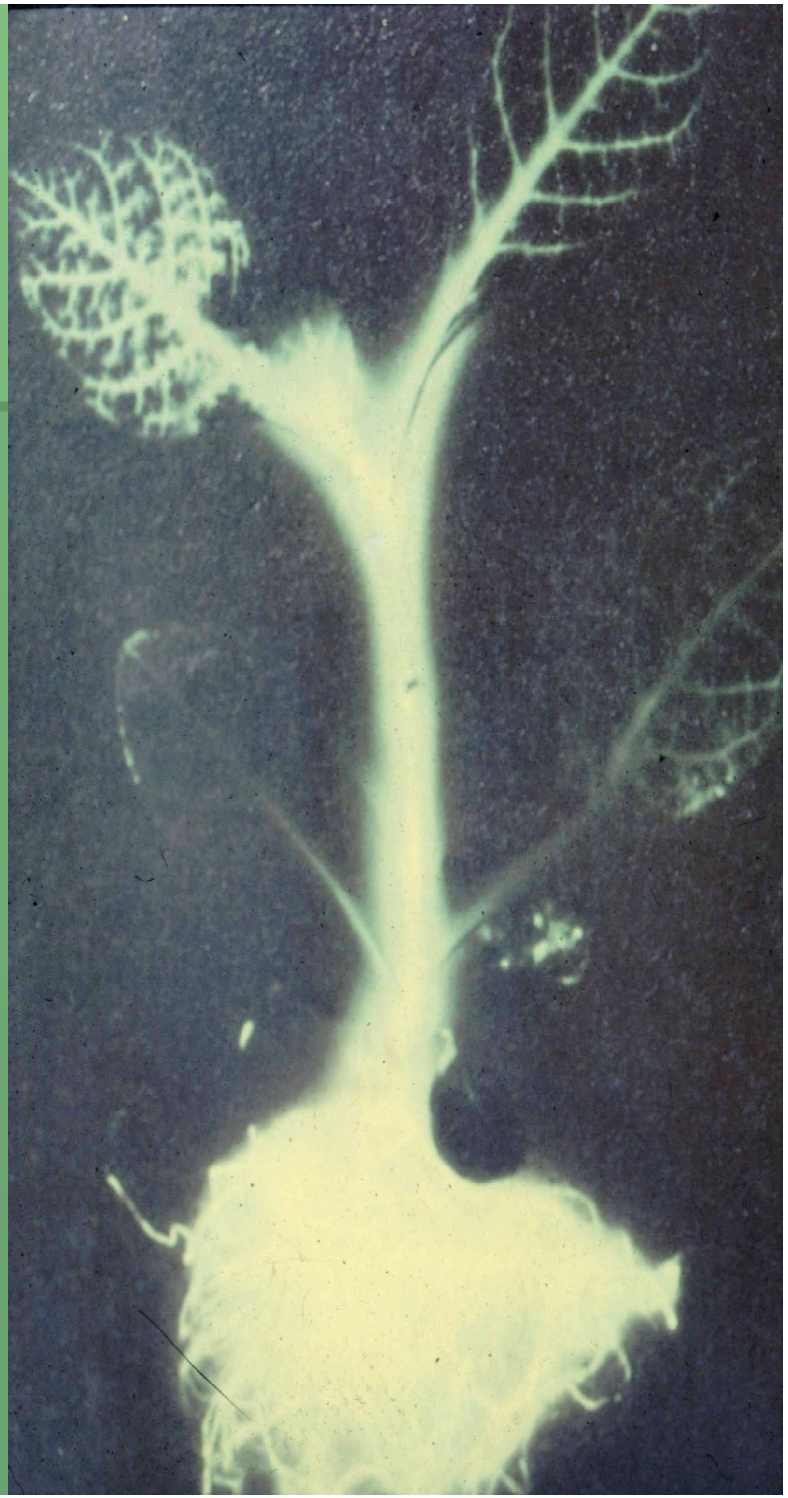
Plant as biofarm of antibodies
Collaboration with Dr. K. Fujiama
NIBIO-Osaka University

2. 'Pl'antigens

Plant as biofarm of di antigens for vaccins

3. Molecules with antibiotic activity

Plant as biofarm of peptides with antimicrobial activity



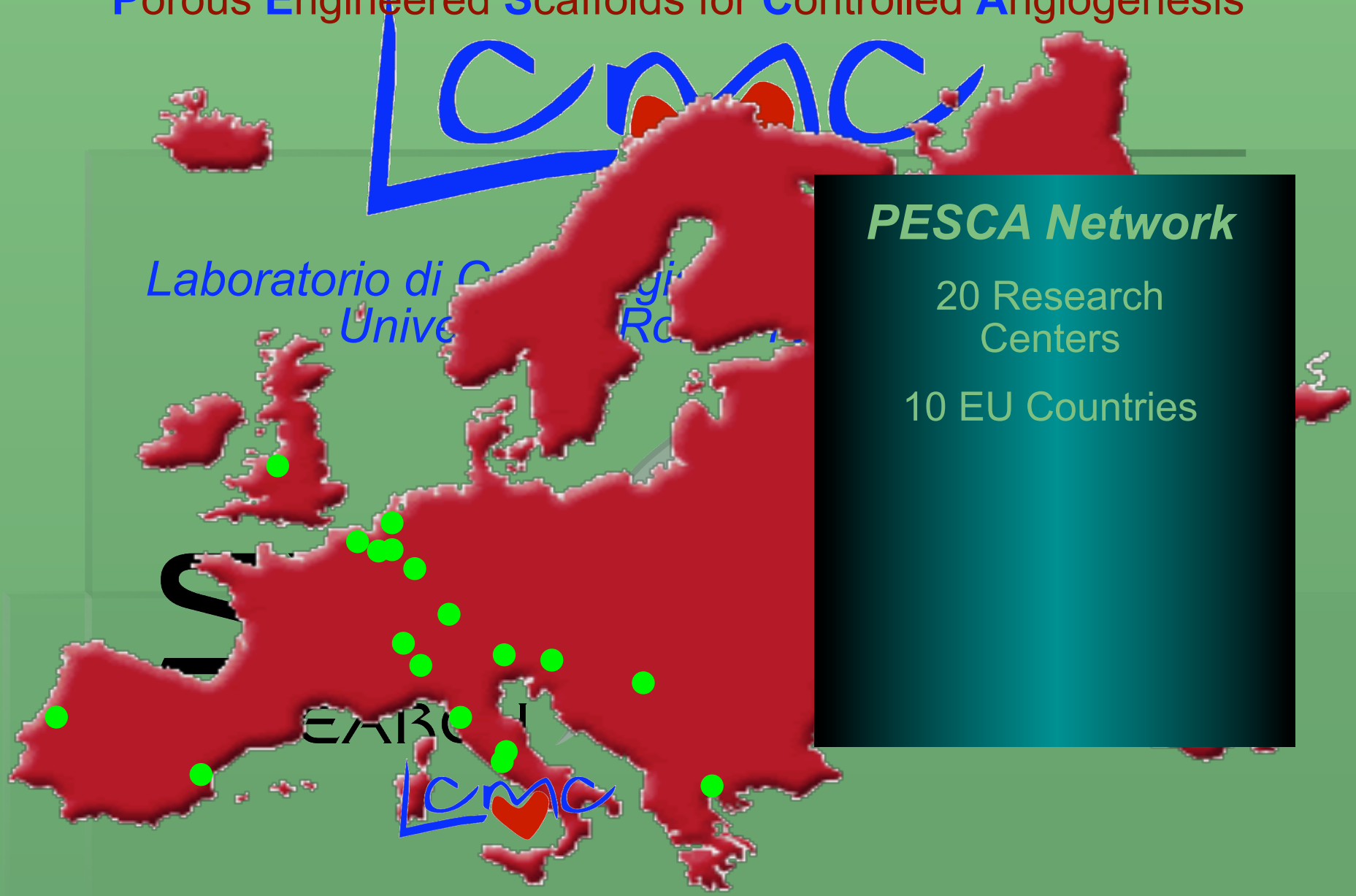
Health Biotechnology

1. Regenerative Medicine

Tissue engineering - Clinical and Pre-Clinical Application of Cell Sheet Engineered Tissue
Prof. Paolo Di Nardo, University of Rome Tor Vergata
Prof. Teruo Okano, Tokyo Women's Medical University
Gene and cell therapy for cardiovascular disorders
Prof. Mauro Giacca ICGEB Trieste
Translational Research activities in Osaka
Prof. Akira Myoui, Osaka University Hospital
Bioartificial Pancreas
Prof. Hiroo IWATA, Kyoto University
Possibility of regenerative medicine for retinal diseases
Prof. Masayo Takahashi, Kyoto University Hospital
Epithelial stem cells in regenerative medicine
Prof. Michele De Luca, University of Modena and Reggio Emilia (ASTER)

PESCA

Porous **E**ngineered **S**caffolds for **C**ontrolled **A**ngiogenesis



PESCA Network

20 Research Centers

10 EU Countries

LCMC Strategy

immunomagnetic

PATENTS

Prof. Teruo Okano

Institute of Advanced Biomedical Engineering and Science
Tokyo Women's Medical University

myocardial infarction
(LAD ligation)

Health Biotechnology
2. New Drug Development

Human dendritic cells (Dc) a tool to dissect host-pathogen interation: bordetella pertussis virulence factors are involved in evading strategy by affecting Dc functions.
Dr. Clara M. Ausiello Italian Institute of Health ISS
New strategies for vaccine development
Dr. Yasuko Mori, National Institute of Biomedical Innovation
AIDS vaccines & FaBioCell : GMP facility for cell-based therapies and selected outlicensing opportunities of Italian National Institute of Health
Dr. Giovan Battista Cozzone on behalf of Dr. B. Ensoli & dr. F. Belardelli – ISS
Innovative health products
Prof. Ruggero Bettini, University of Parma TEFARCO INNOVA
High-throughput analysis of the complexity of the transcriptome
Prof. Piero Carninci - RIKEN, Genome Science Laboratory, Wako

Interaction between natural compounds with tumoral cells and model membranes looking insight the cholesterol role: a project for the discovery of new active compounds from plants of the Amazon rain forest

Dr. Cristiano Giordani In collaboration with: Kyoto University, Istituto Superiore di Sanita'- Rome, University La Sapienza of Rome and Mr. Chris Clark, President of the Xixuau-Xiparina reserve, Amazon Rain Forest, Brazil.

Inhibitory effect of serotonin derivates on short-term high glucose-induced early stages of Atherosclerogenesis

Dr. Rosaria Piga, Kyoto Prefectural University of Medicine

Bilitranslocase: a bilirubin plasma membrane carrier that plays a role in the bioavailability of plant polyphenols

D.ssa Sabina Passamonti, University of Trieste

A bilirubin plasma membrane carrier that plays a role in the bioavailability of plant polyphenols

- *Sabina Passamonti*
- University of Trieste
- Department of Biochemistry, Biophysics and Macromolecular Chemistry
- *Products & services in biotechnology research*

- **anti-bilitransocase antibodies for use in biological assays**

Scientific collaborations

NAME	AFFILIATION	TOPIC OF COLLABORATION
Prof. Yuichi SUGIYAMA	The **University of Tokyo**, Dept. of Molecular Pharmacokinetics, Graduate School of Pharmaceutical Sciences.	Drug transport across the intestinal barrier and in the liver: role of bilitranslocase.
Prof. Junji TERAO	The **University of Tokushima** Graduate School, Institute for Health Biosciences, Department of Food Science.	Transport of dietary flavonoids across the intestinal barrier: role of bilitranslocase.
Dr. Rosaria PIGA	**Kyoto Prefectural University of Medicine**, Department of Inflammation and Immunology	Bioactivity of natural antioxidants on atherosclerosis onset and progression.

Industrial and Environmental Biotechnology

Industrial Biotechnology in Europe and Italy: the experience of Suschem Italian Technology Platform for Sustainable Chemistry
Prof. Danilo Porro – University of Milan-Bicocca – Executive Board of the European Federation of Biotechnology.
Recent progress in Industrial Biotechnology in Japan - The Challenge of Osaka University Industrial BioTech Group
Prof. Satoshi Harashima, Dept. of Biotechnology, Osaka University
Biocatalysis: the Italian contribution to industrial biotechnology

Prof. Lucia Gardossi, University of Trieste
Energy from organic waste: modulation of the bio-production of methane and hydrogen by metal systems and other components.
Prof. Michele Aresta – CIRCC and University of Bari
IBIOCAT: the new Italian Consortiumfor Research and Industrial application of Biocatalysis and Biotechnology
Dr. Oreste Piccolo
TheTA: new tags to improve enzyme expression and solubility andBiotech industrial applications in Italy. An example of success.
Dr. Fabio Arenghi-CPC Biotech s.r.l. - ACS Dobfar S.p.A.
Marine environment and effects of pollution on the marine Organisms
Dr.YukioYokota – Aichi Prefectural University

Lombardia Region

- Lombardia is one of the largest regions and definitely the most flourishing in Italy, representing over 1/5 of the whole national economy. It is amongst the richest Regions in the EU: Italian R&D activity is mostly concentrated in Lombardy, with 12 universities and 74 courses, attended by 250.000 students on average. Almost 9.000 students earn a degree in technical and scientific subjects every year, with a range of more than 60 specializations. The 30% of private researchers and the 22,2% of the total researchers in Italy is localized in Lombardy.

Strategy for R&D in Lombardy Region

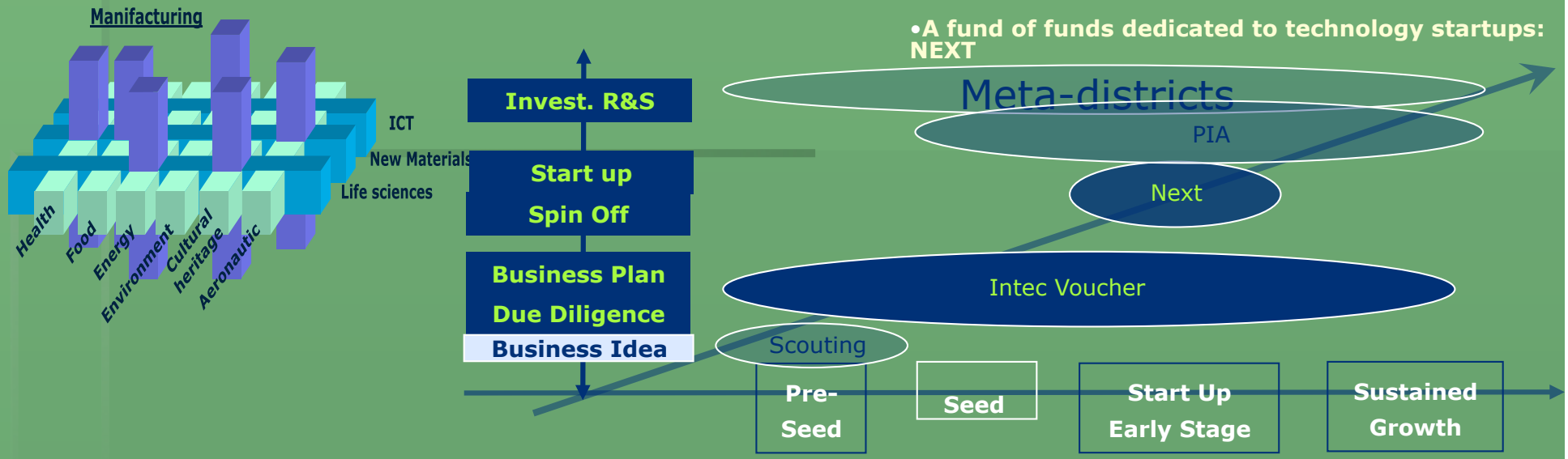
(in the field of biotechnologies)

The working program related to R&D in the Region implies an exhaustive analysis of the existing structures and the single sectors' foresight (**Health, Food, Energy, Manufacture, Environment, Valorisation of Cultural Heritage, Aeronautics and Safety**) as well as of the related technologies (**ICT, Biotech and New Materials)** with a view to define and set up strategic initiatives in line with the industrial development framework and the competences of the scientific system**.**

Lombardy Region instruments to sustain startups

Lombardy has created an integrated set of instruments to foster innovation and creation of technology startups:

- **Scouting programmes to identify project for technology transfer and startups creation**
- **A voucher system for business and technical evaluations, patenting and research support**
- **Integrated sets of national and regional grants to support R&D in companies**
- **Focus on 'excellence' meta-districts including biotech**
- **A fund of funds dedicated to technology startups: NEXT**



New Instruments (in support to the biotech)

a) **Governemental Agreement: Technological Clusters** (Advanced Material, Biotechnologies, ICT) - **Technology foresight** (RISE project: the results of the first RISE phase identified the following technological priority areas: Biotechnologies, Advanced Materials, ICT, environmental and energetical technologies).

b) **Meta-districts** (Materials, Biotecnologies alimentary, other biotechnologies, ICT, Design, Fashion)

c) **Support of Research and Excellence Centres** (3 centers)

d) Accreditation /**Voucher** for Research **(Questio: www.questio.it)**

e) **Bioiniziativa (www.bioiniziativa.it)**

f) **Funds for Start-Up and Spin-Off**: **The NEXT Fund** (FinLombarda)

g) National and regional laws for financing research and innovation (l.r. 35/96, l. 140/97, l. 46/82)

THE REGION'S CENTRES OF EXCELLENCE: advanced research centres promoted by Lombardy Region

1) Research, development, innovation and technology transfer infrastructure at Milan's Politecnico University;

2) **Molecular Oncology Research Centre (IFOM), Milan: upgrading the competitive edge of University, scientific and business structures engaged in advanced biotechnology research;**

3) **Centre of excellence, innovation and technology transfer for chemical and pharmaceutics biotechnologies at the Bicocca University, Milan;**

4) Technology innovation Pole, Dalmine;

5) Multi-sector and technological services centre, Brescia;

6) Centre of excellence for research and technological/organizational transfer, Como;

7) Centre of excellence for research, innovation and technology transfer in plasmas application field at the Bicocca University, Milan;

8) **Fondation "Parco Tecnologico Padano", centre for research on genomics, biological information science and technology and agrobiotech business park, Lodi;**

9) Centre of exellence for the creation, on Legnano area, of a research centre and test on new materials.

ICE TOKYO-PROMOS Activity

- Meetings one to one : 21 in Osaka
  15 in Tokyo
- Preliminary commercial agreement
- Positive experience on meeting organization and japanese counterparts
- Follow up of the initiative wiil be performed by PROMOS in the next six months of the 2007
- Next meeting in Milan: Bioforum, 25-26 Sept., 2007

Emilia-Romagna Region

- Emilia-Romagna region is strengthening its position as a knowledge based economy: both private and public actors strongly believe in the increased strategic importance of Research and Development (R&D) and Innovation for the competitiveness of the regional industry. For this reason Emilia-Romagna has endorsed a regional policy for R&D and innovation focused on the promotion of industrial research, technological development and the transfer of new technologies from knowledge production centres to the regional industrial system

Emilia-Romagna High-Tech Network

- The Network comprises 27 Industrial Research Laboratories, 24 Innovation Centres and 6 Innovation Parks operating in seven key sectors: Advanced Mechanics (HI-MECH District); Environment, Sustainable Development and Energy; Agro-Food Industry; Building and Construction; **Life Sciences and Health**; Organisational Innovation and Information and Communication Technologies (ICT).
- The network is supported by **ASTER Science Technology Business**, the consortium for industrial research, technology transfer and innovation created among the Emilia-Romagna Regional Government, the Universities of the region, important national Research Centres such as CNR, ENEA, INAF and INFM, the regional Union of Chambers of Commerce and Industry and the regional Entrepreneurial Associations.

Friuli Venezia Giulia Region

- The Regional System of Science and Innovation is made up of a network of 40 national and international, public and private R&D Centres such as the ICTP (The Abdus Salam International Centre for Theoretical Physics), the Universities of Trieste and Udine, SISSA (the International School for Advanced Studies), etc.. Personnel involved in R&D in the province reaches 4.500 units and the ratio between researchers and active population is equal to 37,1/1000 (Japan 9,1/1000, USA 8,1/1000). Every year more than 8,600 researchers from all over the world come to Trieste's scientific institutions for different periods of study and research, thus enhancing brain circulation and preventing brain drain.

Friuli Venezia Giulia Region

The Region is host to the Technology District in Molecular Biomedicine, an example of region-wide networking involving all the main players - the three universities, the local biotech companies and research and financial institutions. The key to its development lies in the synergy between public and private stakeholders, where the four elements of public capital, talents, innovative enterprises and venture capital converge and are engaged in a coordinated action.

Conclusions and perspectives

- High scientific level of the seminar
- Common interest in the biotech sectors
- Positive bilateral interaction
- Joint research project proposals to MAE or national/international Organisms
- Joint laboratories
- Major effort to identify biotech sectors and modalities for commercial agreements