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The 7th Research Framework Programme in the area "Food, Agriculture, Fisheries and Biotechnology"



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Cooperation – Collaborative research

10 Thematic Priorities

€M *

1.	Health	6.050
2.	Food, Agriculture, Fisheries and Biotechnology	1.935
3.	Information and Communication Technologies	9.110
4.	Nanosciences, Nanotechnologies, Materials and new Production Technologies	3.500
5.	Energy	2.300
6.	Environment (including Climate Change)	1.900
7.	Transport (including Aeronautics)	4.180
8.	Socio-Economic Sciences and the Humanities	610
9.	Space	1.430
10.	Security	1.350

* Council's agreement of July 2006

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SEVENTH FRAMEWORK
PROGRAMME

The term 'bio-economy' covers all industries and economical sectors that produce, utilize or manage biological resources.

The European bio-economy has an annual turnover of more than 1500 billion € and employs 22 million people.

Sector	Annual turnover (billions of €)	Employment (millions)	Source
Food & Beverages	850	4.1	CIAA
Agriculture	210	15	COPA-COGECA
Fisheries	8	0.5	FAO
Paper, Leather, Pulp, etc.	400	0.3 direct (4.0 indirect)	CEPI
Forestry, Wood	150	2.7	CEI-BOIS
Industrial Biotech	50		McKinsey
total	1618	22.1	



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THE EUROPEAN KNOWLEDGE-BASED BIOECONOMY

QUALITY ASSURANCE
STRATEGIES TRACEABILITY,
CONSUMER SCIENCE

SOCIETAL NEEDS

STABILITY -
BIODEGRADABILITY
FUNCTIONALITY (Chirality)



“Fork to Farm”
Food, health and well-
being

Life sciences &
biotechnology for
sustainable
non-food products +
processes

ADVANCED FOOD
TECHNOLOGIES, FOOD QUALITY
DETERMINANTS, NUTRITION

PROCESSING

WHITE BIOTECH
CLEAN BIOPROCESSES
RAW MATERIALS/WASTE

LOW INPUT FARMING - BIODIVERSITY
ANIMAL HEALTH - RURAL DEVT.

PRODUCTION

GREEN/BLUE BIOTECH
OPTIMISED RAW MATERIALS

Sustainable production and management of biological resources from
land, forest, and aquatic environments





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Food, Agriculture, Fisheries and Biotechnology: Rationale

- Build a European **Knowledge-Based Bio-Economy (KBBE)**
- Respond to **social and economic challenges**:
 - High quality food and sustainable food production
 - Food-related disorders (cardiovascular, obesity ...)
 - Infectious animal diseases and zoonoses
 - Sustainable agriculture/fishery and climate change
 - Clean biomaterials from renewable bio-resources
- Involve all stakeholders (incl. industry) in research
- Support CAP and CFP
- Respond quickly to emerging research needs

→ 4 Fs: Food, Fiber, Fuel and Feed





2. Food, Agriculture, Fisheries and Biotechnology

2.1.

Sustainable production and management of biological resources
from land, forest, and aquatic environments

2.2.

“Fork to farm”: Food (including sea-food), health and well being

2.3.

Life sciences, biotechnology and biochemistry for sustainable
non-food products and processes



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Food, agriculture, fisheries and biotechnology research:

What's new ?

- Pillar 1 “Sustainable production and management of biological resources” and Pillar 3 “Life sciences and biotech for sustainable non-food products and processes”
- Some topics under pillar 1 & 3 partly financed in FP4 and FP5 (BIOTECH, FAIR, QoL, etc.), but FP6 efforts scattered and not of sufficient critical mass (some activities under materials, energy and environment) providing no synergies
- Technology platforms and their input in the area of plant biotechnology, forestry, industrial biotechnology, animal breeding, global animal health, and food
- Pillar 2 “Food, health and well-being” ensures continuity of FP6 “Food quality and safety” research



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Food, agriculture, fisheries and biotechnology research:

New in FP 7: Some FP 6 activities outside the Thematic Priorities will be integrated in the FP 7 Themes !

such as

- Integration of new and emerging science and technologies (NEST)
- Support to policy development (CAP, CFP, public health, food safety, animal health, ...)
- International co-operation (SICA)
- ERA-Nets, ERA-Nets +

... to be defined on the level of the specific programme or workprogramme



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Food, agriculture, fisheries and biotechnology research: Clear need to prioritise !

“More with less”

- Theme 2 FP7 “Food, Agriculture, Biotechnology” has much broader scope than priority 5 “Food Quality&Safety” of FP6 (added activity 3 on biotech products and processes for non-food applications)
- Research to support policies, international cooperation and coordination of national research is integrated into the themes
- Budget for first calls of theme 2 - FP7 comparable (or lower) than for priority 5 - FP6

Need to prioritise along the following criteria:

- New areas/topics not (little) covered in previous FPs.
- Continue/follow-up on successful EU research activities in order to achieve maximum impact.
- Preparatory actions for identifying priority topics/activity areas for future calls, i.e. analysis of certain research/technology options for addressing specific goals; in cooperation with TPs and ERA-NETs



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Food, agriculture, fisheries and biotechnology research: Borderline with other FP7 themes

- Enabling/systems biology research on plants, animals and microbes complementary to systems biology for human health applications in theme 1.
- Complementary research relating to the management/conservation of natural resources and biodiversity is addressed under the “Environment including Climate Change” theme 6.
- Demonstration of bioprocesses for biomass conversion to energy/materials under this priority – up-scaling and complete process design under materials and energy themes (themes 4 and 5).



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Activity 1: Sustainable production and management of biological resources from land, forest and aquatic environments

- Enabling research ('omics', converging technologies, bio-informatics, biodiversity) for micro-organism, plants and animals
- Competitive, sustainable and multifunctional agriculture, forestry, fishery and aquaculture
- Animal health production and welfare; animal diseases incl. zoonoses
- Marine resources, fishery, aquaculture
- Development of policy strategies for knowledge based bio-economy, agriculture, fishery as well as rural and coastal areas





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Activity 2:

“Fork to farm”- Food (including sea-food), health and well being

- **Consumer, societal, industrial and health aspects of food and feed**
- **Nutrition, diet related diseases and disorders**
- **Innovative food and feed processing**
- **Improved quality and safety of food, beverage and feed**
- **Total food chain concept**





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FP7 Sub-Pillar: Fork to Farm

Consumers

Nutrition

Processing

Safety

Environment

From Fork to Farm

Health and well-being of consumers

Nutritional value / digestion / health impacts

Organoleptic impact

Safe, high-quality foods

Preparation

Storage / transport / retail

Processing

Environment

Production systems:
Agriculture / Fisheries / Aquaculture



by the European Commission

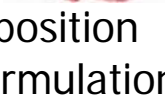


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Addressing 'Complexity' in Food & Nutrition Research by means of Converging Technologies

Complex 'Food'



Food composition
Product formulation



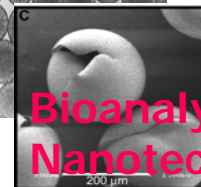
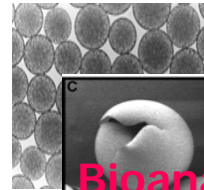
Complex 'Behaviour'



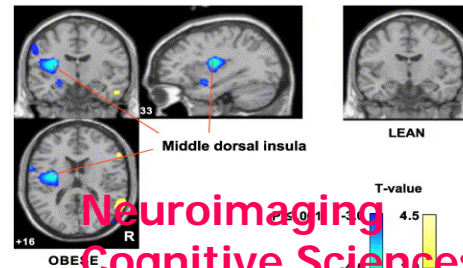
Consumer Preferences
Eating Patterns
Food Choice



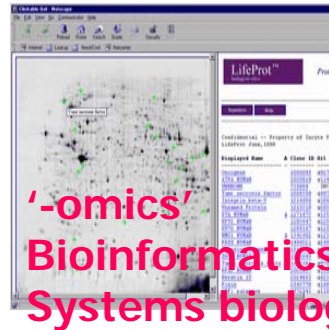
Complex 'Body'



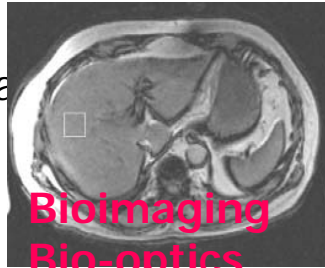
Bioanalytics
Nanotechnologies
Microsensorics



Neuroimaging
Cognitive Sciences
Integrative Physiology
Behavioural sciences

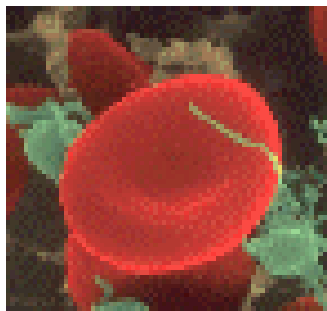


'-omics'
Bioinformatics
Systems biology



Bioimaging
Bio-optics
Integrative Physiology

Complex 'Cell'



Gene-nutrient interactions
Metabolic networks
Signal transduction



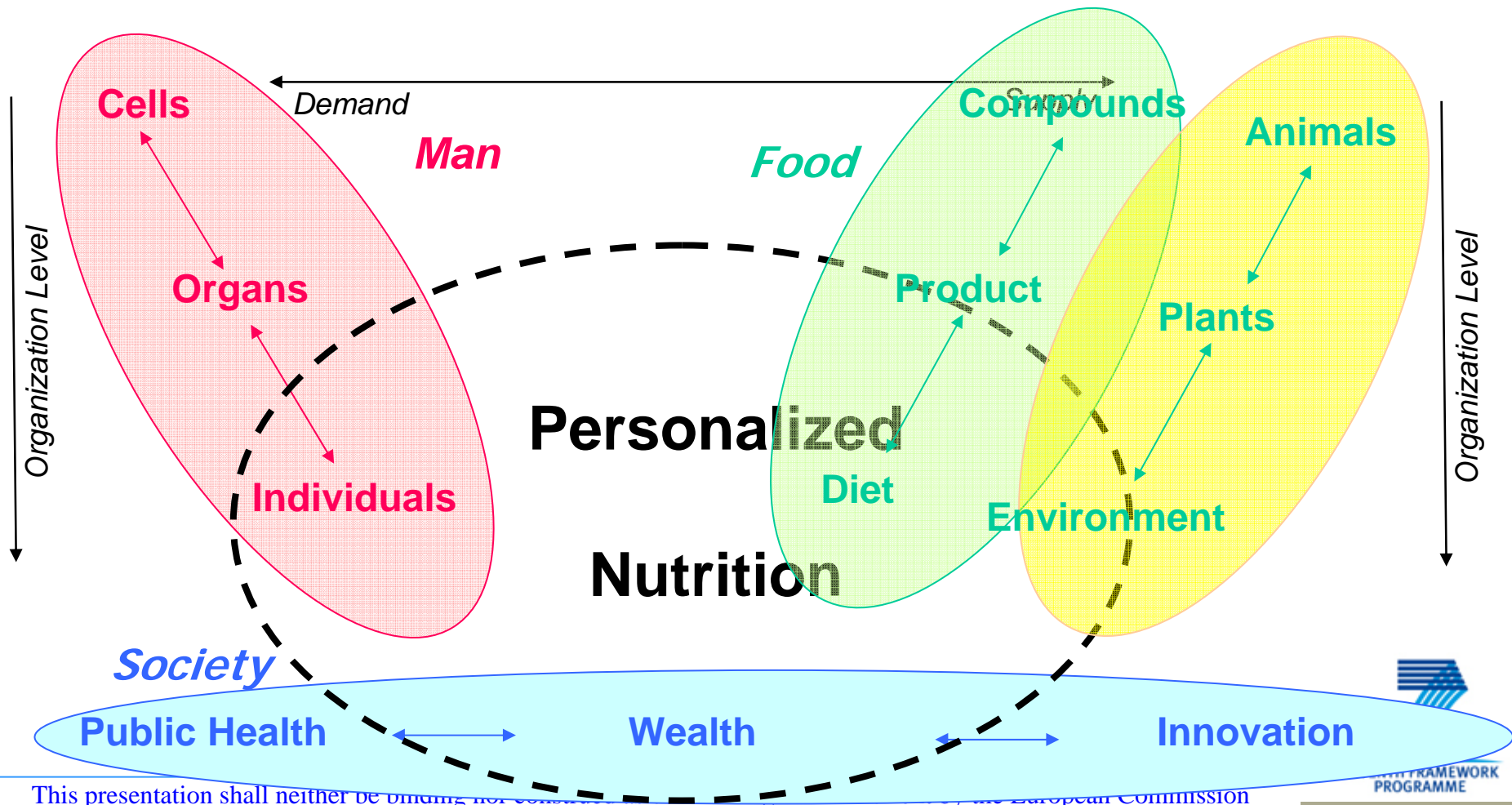
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'Knowledge based bio-economy' - Complexity in food and health

... means ...

- to connect biological systems research and economic innovation systems
- to tackle 'complexity' issues at organization levels beyond the life sciences

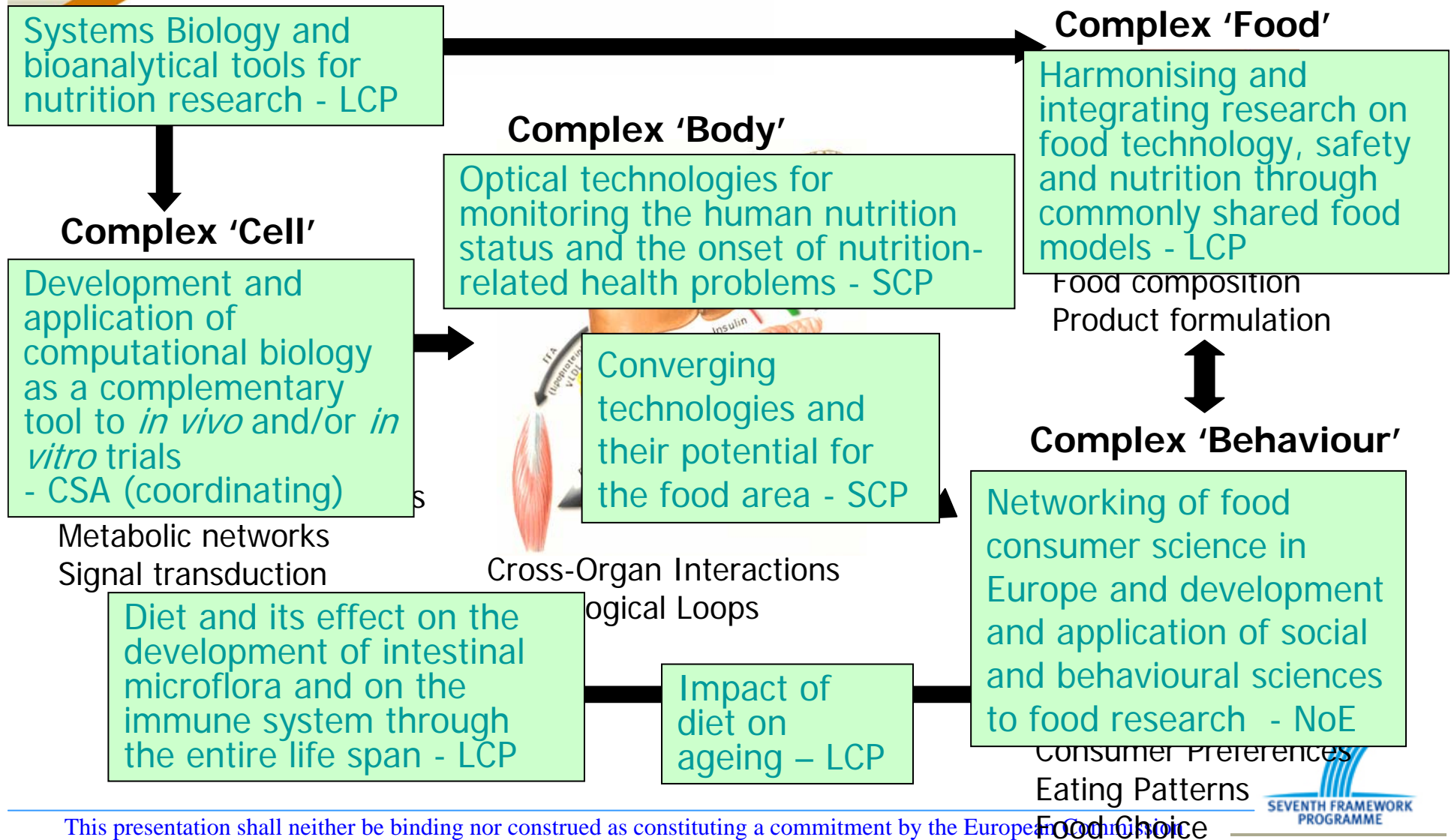




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Our contribution in research ...





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Cross-product approach: Multiple potentials for research on a certain product category

Example: milk and dairy products

- Milk and mental performance/development of children

KBBE-2007-2-2-01: Effect of diet on mental performance of children

- Dairy products (joghurt, etc.) and gut immune system

KBBE-2007-2-2-07: Diet and its effect on the development of intestinal microflora and on the immune system through the entire life span

- Improved processing technologies for dairy products

KBBE-2007-2-3-02: Assessment and improvement of existing food and feed technologies

- Toxins, organic contaminations, etc. in milk and dairy products

KBBE-2007-2-4-02: Detecting contaminants in the food and feed chain

... etc.





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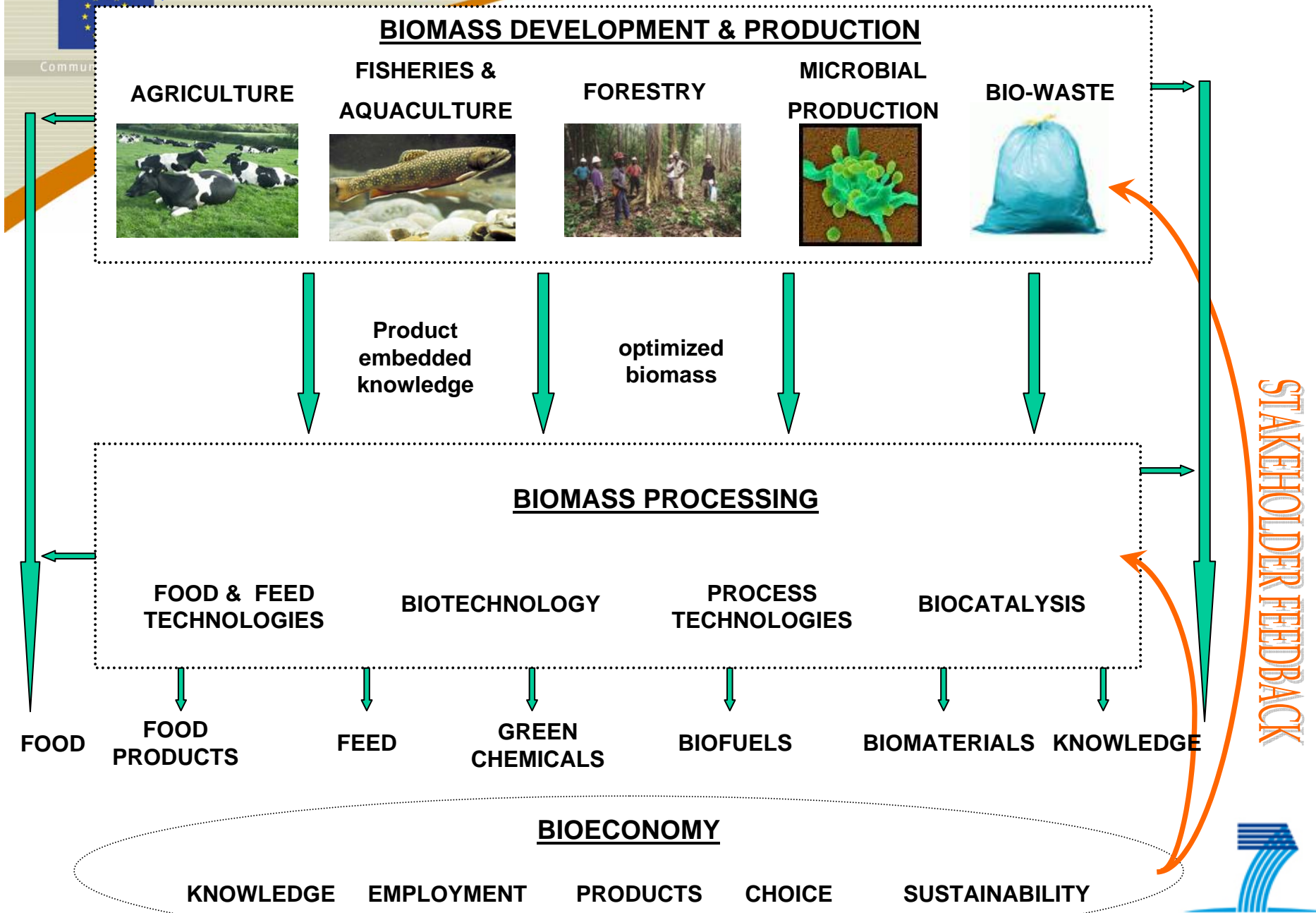
Activity 3:

Life sciences, biotechnology and biochemistry for sustainable non-food products and processes

- **Improved crops, feed-stocks, marine products and biomass for energy, environment, and high added value industrial products; novel farming systems**
- **Bio-catalysis; new bio-refinery concepts and other bioprocesses**
- **Forestry and forest based products and processes**
- **Environmental remediation and cleaner processing**



FOOD, AGRICULTURE AND BIOTECHNOLOGY RESEARCH: DEVELOPING THE KBBE



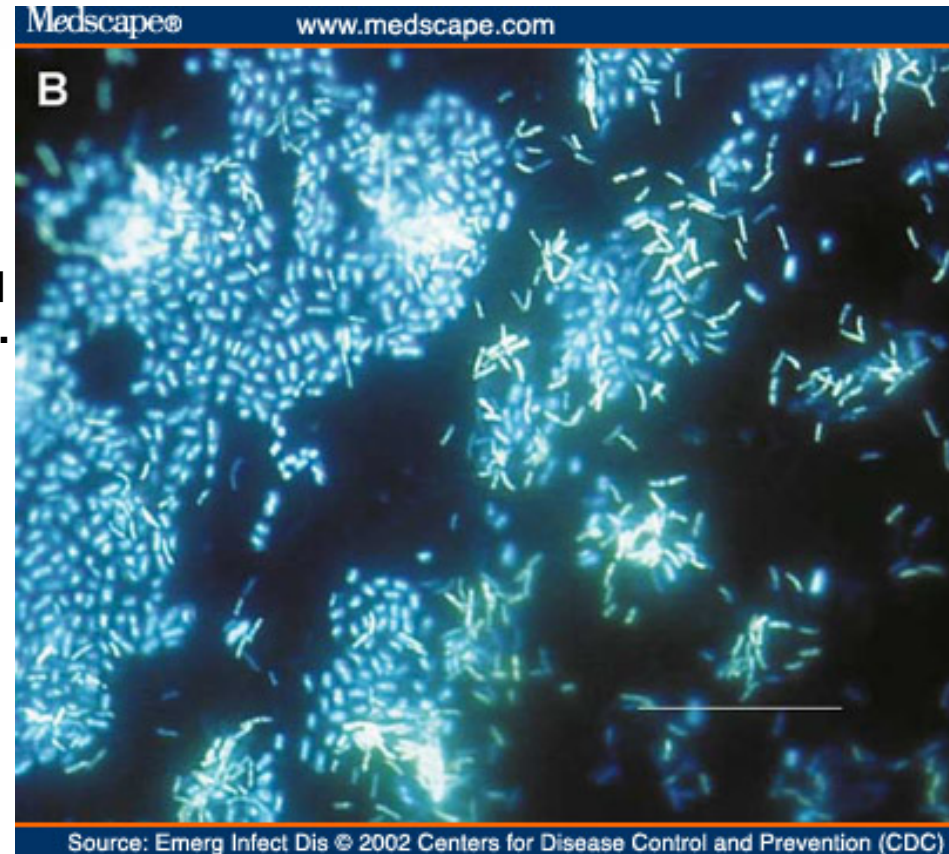


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Exploiting Molecular Microbial Diversity: *A special case*

- The discovery that bacteria are able to communicate with each other changed our general perception of many single, simple organisms inhabiting our world.
- Instead of language, bacteria use signalling molecules which are released into the environment (Quorum Sensing). As well as releasing the signalling molecules, bacteria are also able to measure the number (concentration) of the molecules within a population.
- Thus the purpose of quorum sensing is to coordinate certain behaviour or actions between bacteria of the same kind, depending on their number.
- Biotechnology can exploit QS by directing microbial behaviour either for bioproducts synthesis in a bioreactor or by degradation of pollutants in open environment





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Our contribution in research...

- MICROBIAL STRESS IN CONTAINMENT - Study of microbial stress for more robust industrial micro-organisms
- IMPROVED MICROBES - Metabolic engineering and modelling
- IMPROVED MICROBES FOR THE ENVIRONMENT - Microbial gene expression under condition of stress
- ACTIVITY MINING IN METAGENOMES – Exploring molecular microbial diversity in aquatic environment or the soil
- SYNTHETIC BIOLOGY FOR THE ENVIRONMENT - The use of Synthetic Biology for the solution of environmental problems



Financial Perspectives

Non-linear budget evolution

2007	2008	2009	2010	2011	2012	2013	
192	210	233	262	299	333	371	m€, appr.

'Method of Rolling Loan'

	Budget 2007	Budget 2008	Budget 2009
Large projects; NoEs (two stage – except 2007 !)	Call 1	Call 2A	Call 3A
Small CPs/CSAs (one stage)	Call 1	Call 2B	Call 3B

Workprogramme 2007
Workprogramme 2008
Workprogramme 2009

.....etc.





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The call approach

Work programme 2007

- **CALL KBBE-2007-1**
 - Publication: 22 Dec 2006
 - CSA, SCP, LCP & NoE covering all activities and areas
 - covering full 2007 budget (190.09 M €)
 - 1 step evaluation procedure (exceptionally also for LCP & NoE !!)
 - Deadline for proposal submission: 2 May 2007

- **CALL KBBE-2007-2A**
 - Publication: May 2007
 - **but already part of Work Programme 2007 !!!**
 - LCP & NoE covering all activities and areas
 - 2 step evaluation procedure
 - Deadline for proposal submission: 11 Sep 2007, 31 Jan 2008
 - Final evaluation (Feb 2008)

- **CALL ERANET-2007-RTD**
 - 2.0 M € for Theme 2



Theme 2-specific requirements and some general aspects of high importance

- Specific participation rules for Coordination and Support Actions (coordinating type) applied for Specific International Co-operation Actions (SICA):
3 entities established in a Member States or Associated Countries plus 3 partners in International Co-operation Partner Countries (ICPC)
(instead of 2 + 2)
- Funding thresholds (to be regarded as an eligibility criterion !):
 - small Collaborative Projects: up to 3 M€
 - large Collaborative Projects, Networks of Excellence: between 3 and 6 M€
 - Coordination and Support Actions: up to 1 M€
- 2 ERA-NETs (mediterranean agriculture, animal health) and 4 NoE (zoonoses, consumer sciences, high-tech food processing, 'pharming') in KBBE-1 and -2A
- One project per topic will be funded
- List of SICAs in the Work Programme (WP) with indications on type/region and minimum number of third countries being requested
- Footnotes on complementary topics open in other 'Themes'
- Indicative topics of the 2008 work programme outlined in 2007 work programme



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Deadlines for Theme 2

KBBE-2007-1: 2 May 2007 (all funding schemes, one stage approach)

KBBE-2007-2A: Large Collaborative Projects and Networks of Excellence

two stage submission and evaluation approach

call publication: 8 May 2007

1st stage deadline: 11 September 2007

2nd stage (full proposal) deadline: 31 January 2008



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Minimum conditions for participation

Specific:

- Frontier research actions (ERC): – at least 1 legal entity established in a MS or AC
- Coordination and support actions (CSA) and actions in favour of training and career development of researchers – minimum of 1 legal entity (except actions to coordinate)
- Collaborative projects* addressing the participation of international cooperation partner countries (INCO) – minimum is 4 participants of which 2 in MS or AC and 2 in INCO countries

* for CSA-SICA (coordinating type): 3 entities established in a MS or AC plus 3 partners in INCO countries (see WP, Theme 2)

- Participation of international organisations and participants from third countries possible if in addition to minima



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<http://etp.ciaa.be>

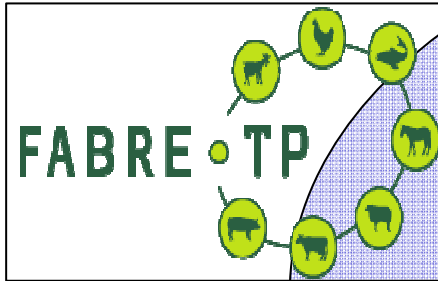
www.suschem.org



Industrial biotechnology

European Biofuels TP

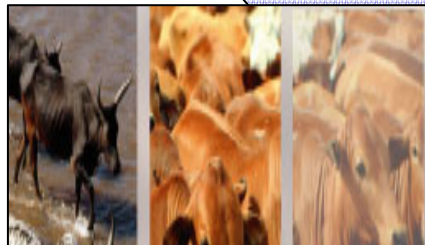
Knowledge Based Bio-Economy



Farm Animal Breeding
www.fabretp.org



www.forestplatform.org



ETP
Global Animal Health
www.ifah.be/Europe/EUPlatform/Platform.htm



ETP
Plants for the Future
www.epsoweb.org





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ERA Nets in the KBBE sector

ACRONYM	TITLE
ERA-PG	European Research Area - Plant Genomics
SAFEFOODERA	Food Safety - Forming a European platform for protecting consumers against health risks
ERA-IB	Towards an ERA in Industrial Biotechnology
EUPHRESKO	Coordination of European Phytosanitary (Statutory Plant Health) Research
EUROTRANSBIO	EUROpean network of TRANS-national collaborative RTD for SME's projects in the field of BIOtechnology
WOODWISDOM-NET	Networking and integration of National programmes in the area of wood material science and engineering
ERA-SAGE	European Research on Societal Aspects of Genomics
CORE-ORGANIC	Coordination of European Transnational Research in Organic Food and Farming
ARD	The Agricultural Research for Development (ARD) dimension of the European Research Area (ERA)
ERASysBio	Towards a European Research Area for Systems Biology - A Transnational Funding Initiative to Support the Convergence of Life Sciences with Information Technology & Systems Sciences



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International Co-operation in Food, Agriculture and Fisheries, and Biotechnology

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International co-operation in *Food , Agriculture and Biotechnology*

1. Opening

- 1.1 Opening of all activities to participation by Third Countries
- 1.2 Certain topics particularly encourage international co-operation

2. Specific International Co-operation Actions (SICA)

on selected topics, with priority partner countries / regions :

- 2.1 BIREGIONAL DIALOGUES, BILATERAL AGREEMENTS,
NEIGHBOURS AND EMERGING ECONOMIES:

topics jointly identified, based on mutual interest and benefits

- 2.2 DEV COUNTRIES: taking into account their needs (focus on MDG)



1. OPENING

in Food , Agriculture and Biotechnology

2. Food, Agriculture and Fisheries and Biotechnologies

2.1.

Sustainable production and management of biological resources
from land, forest, and aquatic environments

2.2.

“Fork to farm”: Food, health and well being

2.3.

Life sciences and biotechnology for sustainable
non-food products and processes

Opening of all activities to International cooperation



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2. Specific International Co-operation Actions in Food, Agriculture and Biotechnology

SICA Examples for the year 2007

Annual Food crops with improved tolerance to multiple ABIOTIC STRESSES	Small collaborative project -	Med (2)
Improving research in support to scientific advice to FISHERIES management outside EU waters	Coordination and support action -	ICPC (3)
Consolidate alliances with third countries in the field of AQUACULTURE	Coordination and support action -	ICPC (3)
NEGLECTED ZOOSES in developing countries: integrated approach for the improvement of their control in animals	Large collaborative project -	ICPC (4)
Developing research tools for FOOD CONSUMER science in the Western Balkan Countries	Small collaborative project -	West Balk (2)
MALNUTRITION in developing countries	Large collaborative project -	ICPC (3)
Reduce contamination by MYCOTOXINS in the food and feed chain	Large collaborative project -	ICPC (3)
ANIMAL BY-PRODUCTS - Novel methods of treatment of animal by-products for the production of substances with biologically valuable functional properties	Small collaborative project -	Russia (2)

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Specific International Co-operation Actions in Food, Agriculture and Biotechnology

SICA Examples for the year 2008 - tentative

Improved AGRO-FORESTRY systems for sustainable farming	ICPC
Valorisation of Andean MICROBIAL BIODIVERSITY for agro-industry of basic crops, for environmental protection and as a source of novel bioactive compounds	Latin America (Andean Region)
Methodologies and tools to support the prevention of OBESITY in Mediterranean Partner Countries	Mediterranean
Linking with international DATABASES on FOOD composition and consumption	ICPC
FUNCTIONAL FOODS , natural products and bioactive compounds from the Black Sea region	Black Sea
SWEET SORGHUM - Alternative energy crops for biofuel production in semi-arid and temperate regions	Latin America and Africa
INDUSTRIAL ENZYMES - Rational design of biocatalysts and enzyme systems with requested properties	Russia
BAGASSES – Improved chemical and enzymatic treatments of bagasses from energy crops, for increased bio-fuels production yields	Latin America and ACP
Plants as EDIBLE VACCINES	Russia
Network of Third Countries NATIONAL INFORMATION POINTS	ICPC and countries with EU bilateral agreements
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OTHER TOPICS with important international co-operation in Food , Agriculture and Biotechnology

Examples (years 2007- 2008)

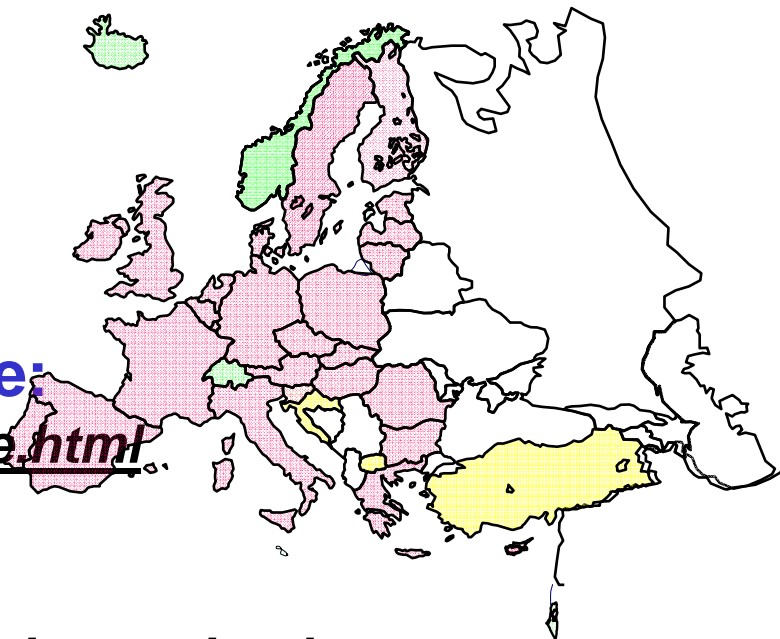
Using new technologies to identify (re-) emerging pathogens from wildlife reservoirs	Enlargement network - Agro-economic policy analysis of the accession and the candidate states and the Western Balkan countries
Developing new methods for valuing and marketing of currently non-marketable forest goods and services	Drivers and limits of enhanced trade in agriculture and food products
Genomics for cereal improvement for food, feed and non-food uses	Trade and agricultural policies - India
Coordination of Agricultural Research in the Mediterranean	Containment of Sharka virus in view of EU-expansion
From capture based to self-sustained aquaculture	Policy and institutional aspects of sustainable agriculture, forestry and rural development in the Mediterranean partner countries
Mitigating adverse impacts of fisheries	Interactions of fisheries and aquaculture of bluefin tuna (BFT)
The structure of fish populations and traceability of fish and fish products	Sustainability of the food chain
Reducing the utilisation of mineral fertilisers by improving the efficiency of nutrient use in European crops	Plant Cell Walls - Understanding Plant Cell Walls for optimizing Biomass potential
Developing the knowledge-based bio-economy	Green oil – Plants providing oils of the future
Evaluating and controlling the risk of African Swine Fever in the EU	Developing vaccines for the control of roundworm infestation in extensive ruminant production systems
Emerging vector-borne diseases, in particular: West Nile fever, Rift Valley Fever and Crimean-Congo haemorrhagic fever	Development of a new generation vaccine for FMD
Improved epidemiological tools for food-borne zoonoses : application of geographical information for live animals and animal products	Non-tariff barriers
	Assessment of impacts from climate change on food

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Further information

- **EU research:** <http://europa.eu.int/comm/research>
- **Sixth Framework Programme:**
<http://www.cordis.lu/fp6/home.html>
<http://www.cordis.lu/fp6/food.htm>
- **Seventh Framework Programme:**
<http://www.cordis.europa.eu/fp7/home.html>
- **Research DG Site:**
http://europa.eu.int/comm/research/index_en.html
- **RTD info magazine:**
<http://europa.eu.int/comm/research/rtdinfo/>
- **Information requests:** [*research@cec.eu.int*](mailto:research@cec.eu.int)





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GLOSSARY

AC: Associated Country

CAP: Common Agricultural Policy

CFP: Common Fishery Policy

CSA: Coordination and Support Actions

ERC: European Research Council

INCO: International Cooperation

KBBE: Knowledge-Based Bio-Economy

LCP: large collaborative projects

MS: Member State

NEST: New and Emerging Science and Technologies

NoE: Network of Excellence

SCP: Small collaborative projects

SICA: Specific International Co-operation Actions

