



QoL/PC-271/4

# THE FIFTH FRAMEWORK PROGRAMME 1998-2002



## QUALITY OF LIFE AND MANAGEMENT OF LIVING RESOURCES

### WORKPROGRAMME 2001

12.10.00

## **IMPORTANT NOTICE FOR POTENTIAL PROPOSERS**

In order to have any chance of success, all proposals must take into account the socio-economic objectives and expected deliverables (Key Actions only) of the Key Action/RTD activities of a generic nature/support for research infrastructures to which it is submitted, not just the research priorities.

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## INTRODUCTION

The Quality of Life and Management of Living Resources programme is built around six specific Key Actions targeted at enhancing the quality of life of European citizens and improving the competitiveness of European industry. The Key Actions are mission oriented and have a number of clear objectives and measurable deliverables. They focus on the immediate socio-economic and market needs of improving the quality and safety of food, controlling disease, harnessing the power of the biological cell, the sustainable development of agriculture and fisheries, and a healthy and independent old age. A unique characteristic of the Key Actions is an ability to address the common needs of cross-linked Community policy objectives such as those in agriculture and fisheries, industry, environment, and health. Proposals to Key Actions are expected to actively contribute to these objectives. This implies consideration of intellectual property protection requirements where appropriate and of measures to exploit results in a self-sustained and economically viable manner.

The capacity of Key Actions to meet emerging socio-economic challenges will depend in part on the extent to which, from the start of the programme, the potential synergies between different projects can be recognised and promoted. In order to ensure this, proposals will be invited from appropriate disciplines in the social sciences to catalyse the links between the life sciences and society.

In addition to the six Key Actions, the programme will support RTD activities of a generic nature with the aim of building up the knowledge base in identified areas of strategic importance for the future. These areas include research in relation to genomes, the science of the brain, public health, chronic diseases, and socio-economic and ethical issues surrounding biosciences.

Supporting the Key Actions and RTD activities of a generic nature, and intrinsic to the programme, are activities such as support for research infrastructures, dissemination and exploitation of results, and training opportunities. Entrepreneurship and participation of small and medium enterprises will be encouraged.

In line with the Commission Communication on Women in Science<sup>1</sup>, the programme encourages due consideration of relevant gender specificities in all of its activities.

Where appropriate, activities which contribute to the European Research Area initiative<sup>2</sup>, while at the same time meeting the required programme objectives, will also be supported.

## FOCUS ON GENOME RESEARCH

The information available on the sequence of a number of genomes and, in particular, the recent publication of the draft sequence of the human genome will have major implications for medicine and human health. In this context, the Commission is launching an initiative aiming to reinforce and further encourage Community RTD activities in the field of "Genome Research for Human Health" within the current "Quality of Life and Management of Living Resources" programme.

This initiative on "Genome Research for Human Health" is being addressed in the Work Programme 2001 through various types of actions:

- a) Enhanced visibility of research priorities in Key Actions, RTD activities of a generic nature and support for research infrastructures with particular relevance to this initiative.
- b) Introduction of an additional line 8.5 on "*Integrated projects in genomics and human health*" to reinforce Area 8 on Research into Genomes and Diseases of Genetic Origin.
- c) Reinforcement of Area 14 on support for Research Infrastructures in the field of "*genomics and human health*", in particular for genomic and proteomic databases and for repositories of guidance suitable animal models.

It is expected that over 100 M€ in total will be available in 2001 for this initiative. Further guidance is provided in an expanded table in Annex IV of this document.

<sup>1</sup> COM(99) 76 final, 17.2.1999

<sup>2</sup> <http://europa.eu.int/com/research/area.html>

## KEY ACTIONS

### **KEY ACTION 1: FOOD, NUTRITION AND HEALTH**

#### **OBJECTIVES AND DELIVERABLES**

The contribution of improved nutrition to the prevention of diet mediated illnesses will lead to significant social and health care benefits, both at the level of the individual citizen and of defined population sub-groups.

However, a lack of scientific consensus, a lack of understanding in how to communicate dietary messages effectively and a changing regulatory environment are hindering the innovation of products that can contribute to consumer health, well-being and enhanced industrial competitiveness. In addition, potential undesirable components arising in the food chain pose a continuously evolving challenge to the safety of the food chain.

Food SMEs play an important role in producing the great diversity of foods in Europe and the retail sector increasingly contributes to strengthen the links between production, processing, and the consumer.

This key action aims to provide a better understanding of consumer requirements, to provide a healthy, safe and high quality food supply leading to reinforced consumer confidence in the safety and wholesomeness of the food supply. A multidisciplinary research effort bringing together a wide range of expertise will be essential to address the following objectives:

- **Addressing consumer needs and enhancing the competitiveness of the European food industry:** The objective is to develop strategies to better interpret consumer demands, attitudes and perceptions, to communicate issues surrounding food risk to consumers more effectively and to improve the quality of food products; thereby strengthening the innovative potential, competitiveness and the creation of employment within the European industry.

*Anticipated deliverables: novel methods of understanding and assessing consumer trust and risk perception; new concepts for effective communication with the consumer; creation of transparent consensus platforms; new predictive models of consumer choice which facilitate innovation of products; the establishment of the scientific basis for the development of nutritionally improved products; optimised raw materials/processing combinations offering added value, safety and improved nutritional characteristics.*

- **Assuring the safety and integrity of the food supply:** The objective is to assure food safety by anticipating risks, tracing the sources of contaminants throughout the complete food chain and quantifying risk factors.

*Anticipated deliverables: optimised methods for detecting undesirable components and for enabling the traceability of materials throughout the food chain; new quantitative methodologies to assess risk.*

- **Understanding the role of nutrition in health and well being:** The objective is to improve understanding and awareness of the role of nutrition, diet and lifestyle in promoting and sustaining health and preventing disease, to support consumer choices for healthy and wholesome foods and to facilitate the development and understanding of health promoting products and diets.

*Anticipated deliverables: new methodologies to determine the relation between nutrition and health, including pan-European databases of food composition and consumption, biomarkers of exposure and effect; a better understanding of the mechanisms underlying the relationship between food components, food habits and optimal health; foods with improved nutritional value; new genetically engineered foods that have real health benefits for the consumer.*

The creation of innovative pan-European networks including regional and national networks involving all appropriate actors will be required to achieve these deliverables and will contribute to the emerging European Research Area. The use of the implementation modalities available, Concerted Actions, Thematic Networks, Accompanying Measures (foresight, mapping, dissemination of results), Training, should be fully exploited as a way of facilitating such networks.

## ***PRIORITIES FOR THE CALLS IN 2001***

### **1.1 Development of safe and flexible and new and/or improved manufacturing processes and technologies (not open in 2001 for RTD projects, demonstration projects, combined RTD/demonstration projects, concerted actions, thematic networks, except for proposals which stem from exploratory awards)**

- 1.1.1. Novel and improved biological raw materials for high quality food
- 1.1.2. Advanced and optimised food technologies, packaging systems and process control
- 1.1.3. Quality monitoring and traceability throughout the food chain.

### **1.2. Development of tests to detect and processes to eliminate infectious and toxic agents throughout the food chain technologies (not open in 2001 for RTD projects, demonstration projects, combined RTD/demonstration projects, concerted actions, thematic networks, except for proposals which stem from exploratory awards)**

- 1.2.1. Improved understanding and control of contamination conditions arising along the entire food chain from primary producer to consumer
- 1.2.2. Rapid detection tests particularly for pathogens and hormones
- 1.2.3. New and safer methods of food production and distribution
- 1.2.4. New methodologies for assessing microbial, chemical and allergenic risks and exposures

### **1.3. Research into the role of food in promoting and sustaining health with respect to diet and nutrition, toxicology, epidemiology, environmental interaction, consumer choice and public health<sup>1</sup>**

In order to achieve the objectives of the key action, multidisciplinary will be particularly encouraged. Proposals must include a specific consumer-science research component. The contribution of behavioural sciences, e.g. sociology, psychology and marketing science, will be particularly important.

#### 1.3.1. Consumer needs, attitudes and responses with regard to food products, food processing and labelling.

In addition to RTD projects, Concerted Actions and Thematic Networks are particularly welcome in this area. Methods to analyse long-term consumer needs and decision-making processes and to improve consumer acceptance and preference for foods that contribute to healthy diets as influenced by cultural, ethnic, educational, and socio-economic background. Investigation into effective communication strategies to raise consumer ability to understand nutritional information and to assess food-related risks. Optimal interfacing between risk assessors and risk managers including communication and sociological aspects. Identification and analysis of factors that determine trust in the food supply and in information sources as well as risk-benefit trade-offs in consumer decision-making. Improved methodologies for collecting, organising and validating food composition and consumption data in relation to health and well-being including factors such as genome, age, cultural origins and lifestyle. Effects of different modes of regulating and organising the food chain on consumer perceptions and purchase decisions. Better understanding of physiological, psychological and socio-cognitive factors, including the role of sensory attributes, leading to liking, sustained consumption and preferences of food products. Better understanding of how purchasing decisions are influenced with respect to, e.g. products from organic farming, supplements, functional foods, and GMOs.

1.3.2. Role and impact of food on physiological functions, physical and mental performance. Study of the impact of diet on behavioural patterns, appetite, satiety, cognitive development, and emotional performance, taking account of gender specificities where relevant. New methodologies for studying the bioavailability of nutrients and non-nutrients from food matrices in humans, including the influence of factors such as genome, age and food processing. Markers and indicators (of dietary exposure, physiological effects, nutritional and health status, effects on gene expression level) for defining the normal range of physiological response and the effects of dietary factors and ingredients, taking account of, where appropriate, recent advances in human

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<sup>1</sup> Where proposals include clinical trials (only phase I and phase II), they will be supported through RTD projects, demonstration and combined RTD/demonstration projects

functional genomics and proteomics. Study of mucosal absorption and microbial metabolism of bioactive molecules as a function of age, health status and food intake.

1.3.3. Cellular and molecular mechanisms underlying links between diet and chronic diseases and disorders. Determination of intermediate end-points of disease and development of new methodologies for intervention studies. Study of the role of nutritional factors in growth, development, and differentiation at the cellular and tissue levels. Study of the genetic variability with respect to dietary response and particular diseases and disorders, including the development of specific biomarkers, and identification of risk factors at the level of the individual, taking account of, where appropriate, recent advances in human functional genomics and proteomics. Influence of foetal and early life nutrition on the pathophysiology of chronic disease.

## **KEY ACTION 2: CONTROL OF INFECTIOUS DISEASES**

### **OBJECTIVES AND DELIVERABLES**

About one third of all deaths occurring globally are due to infectious diseases. Whereas mortality is highest in developing countries, morbidity is considerable in the industrialised world, where direct and indirect costs from disease are very high. Population migration, massive travelling and climatic changes are favouring the rapid spread of pathogens. Given the growing burden of infection in a global environment for trade and travel, Europe and its citizens remain vulnerable. Furthermore, drug resistance is an ever growing health threat. Regarding animal infectious diseases, in addition to the increasing risk to human health represented by zoonoses, outbreaks of infectious diseases in animals for livestock production and aquacultural industry impose heavy costs to the economy.

The main objectives of this key action are: (i) to improve the prevention and treatment of infectious diseases of major public health importance through the development of new and improved preventive and/or therapeutic vaccines and vaccination strategies, (ii) to identify and exploit new targets for anti-infective interventions, (iii) to develop new diagnostic tests, (iv) to develop tools for epidemiological monitoring and forecasting, and (v) to develop the research base for rational public health practices related to infectious diseases.

The understanding of pathogen genomes and exploitation of new technologies based on knowledge acquired on genomics and proteomics are likely to have a major impact on the control of infectious diseases.

Important synergies are expected from the integration of human and animal health research. Regarding infectious diseases in animals for livestock production and aquacultured species, research will provide the scientific and technical basis in support of Community rules and policies, in particular with regard to diseases included in list A of OIE (Office International des Epizooties<sup>1</sup>), those subject to Community eradication programmes and zoonoses. Wildlife animals are included insofar as they represent potential reservoirs of infectious agents.

A principal deliverable of this key action will be integrated Community-wide approaches for the development of control tools against major human and animal infectious diseases, mobilising relevant stakeholders towards that end.

This Key Action also encourages the European research community to contribute to the E.U. accelerated actions targeted at the major poverty related diseases, as mentioned in the G8 Communication of Okinawa<sup>2</sup>, 23 July 2000 and as outlined in the Commission communication on accelerated action targeted at major communicable diseases within the context of poverty reduction<sup>3</sup>.

Specific deliverables include:

#### **– Vaccine development**

*Anticipated deliverables: identification of rational targets and delivery mechanisms and evaluation of candidate vaccines; identification of mechanisms of immune protection, indicators of protection and pathogenicity; development of validated animal models, marker vaccines for animal infectious diseases; multi-centre pre-clinical and clinical trial networks for vaccines.*

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<sup>1</sup> [www.oie.int](http://www.oie.int)

<sup>2</sup> <http://www.g8kyushu-okinawa.go.jp/>

<sup>3</sup> COM(2000)585 final, 20.9.2000

– **Strategies for treatment and prevention**

*Anticipated deliverables: new targets for anti-infective intervention and strategies for novel immune interventions; strategies for the optimal use of anti-infective agents; standardised and validated criteria for resistance monitoring; improved understanding of the biological and epidemiological basis for controlling antimicrobial<sup>1</sup> resistance; networks for resistance monitoring; new diagnostic test systems.*

– **Public health**

*Anticipated deliverables: identification of risk factors; development of risk assessment methods; assessment of new risks for transmission of infection; the research base for an epidemiological surveillance and control network; improved surveillance systems for specific diseases; methods for assessing medicinal product safety and adverse reactions; improved evidence-based public health practices.*

In order to achieve a better integration at European level of efforts aiming at controlling infectious diseases, coordination projects (thematic networks and concerted actions) linking together Community and national activities are encouraged.

Research should take due account of relevant gender specificities.

## ***PRIORITIES FOR THE CALLS IN 2001***

### **2.1. Development of improved or novel mono-component, multi-component and combined vaccines**

Support will be given to the development of vaccines against human and animal infectious diseases, including cancer and other chronic conditions triggered by infectious agents, and zoonoses. The development of vaccines and vaccination strategies both for preventive and/or therapeutic purposes as well as safety aspects of vaccines and vaccination will be considered. Human diseases should be of considerable public health importance, as defined by global morbidity and mortality, or have a well-documented risk of becoming an important health threat. For animal diseases, research should be relevant to the improvement of the human food chain, and human health, animal health and welfare, economy of production, environmental biosafety. It should be relevant to EU common policies in relation to livestock production and aquacultured species. The development of vaccines for humans and animals is also understood as an important strategy to reduce the use of antimicrobials.

To reach these objectives, this key action aims at accelerating the process of research and development of vaccines. It covers the range from strategic research up to clinical evaluation of vaccine candidates. Critical gaps in fundamental knowledge should be targeted, as well as development opportunities explored. Whenever possible, projects should take stock of synergies from the integration of human and animal health research. One major goal will be to bring successful vaccine candidates into early clinical testing.

Projects incorporating strategies for the development of vaccines through the understanding of pathogen genomes are encouraged.

**2.1.1. New vaccination strategies.** Study of immune responses and on adaptive and innate immunity relevant for vaccine development. Studies on new adjuvant, vector and antigen delivery concepts for induction of protective and persistent systemic and mucosal immune responses. Targeted modulation of immune responses. Simplified vaccination strategies, combination vaccines and marker vaccines. Immunisation strategies for special target groups, e.g. neonates, immunocompromised and the elderly. Vaccination strategies for wildlife animals.

**2.1.2. Discovery phase and pre-clinical development of preventive and therapeutic vaccines.** Identification and exploitation of new vaccine candidates, taking into account pathogen properties, pathogen-host interactions and pathogenesis, the role of infections in chronic diseases and cancer as well as environmental and genetic factors. Identification and measurement of protective immune responses and correlates of protection, and studies on adverse reactions, including immunopathology. Development of relevant and novel animal models and of alternatives to animals. Marker vaccines for animal infectious diseases of the list A of

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<sup>1</sup> Antimicrobials include antiviral, antibacterial, antifungal and antiparasitic substances.

OIE.

2.1.3. Clinical evaluation of vaccines. Demonstration projects for early clinical testing (phases I and II) of vaccine candidates of major public health importance, in particular those that would benefit most from public funding, e.g. those of limited immediate commercial interest. Concerted actions and thematic networks for phase III/IV clinical trial networks and methodologies.

## **2.2. Strategies to identify and control infectious diseases**

This area will provide support to the development and exploitation of new concepts for treatment strategies and, following the Council Resolution of 8 June 1999 on antibiotic resistance (1999/C 195/01)<sup>1</sup>, to support integrated approaches to control antimicrobial drug resistance. Support will also be given to the development of new diagnostic tools for infectious diseases in humans and in animals. Projects incorporating strategies for the development of new drugs and diagnostic tests through the understanding of human, pathogen and disease vector genomes are encouraged.

2.2.1. Treatment of, and protection against, human and animal infectious diseases. Identification of new classes of antimicrobials. Discovery of new targets for antimicrobial compounds, taking into account microbial life cycles, utilization of genomics/proteomics and host-vector-pathogen interactions. Development of immunotherapy. Demonstration projects for early clinical testing (phase I and II) of drugs and treatments, in particular those that would benefit most from public funding, e.g. those of limited immediate commercial interest. Development of novel treatment approaches and alternatives to antimicrobials, including non-food based probiotics and competitive exclusion.

2.2.2. Antimicrobial drug resistance and changes in virulence. Understanding the mechanism and evolution of antimicrobial resistance, stability and transmissibility of resistance in and between human and animal populations. Standardisation of methods to define and monitor resistance. Research in support of networks for antimicrobial resistance monitoring. Identification of clinical correlates of resistance. Development of strategies for the optimal clinical use of antimicrobials.

2.2.3. Diagnostic tests for humans and animals. Development of diagnostic tests: new rapid diagnostic and susceptibility tests for focused antimicrobial treatment, high-throughput multiple diagnostic systems, tests for early stages of infection and tests for blood and blood product safety. Identification of markers of disease protection, progression and cure. Methodologies for strain typing and studies on diversity/variability. Preference will be given to diagnostic tests for diseases where no satisfactory assays are presently available and to developments based on major technological advancements.

## **2.3. Aspects of public health and care delivery systems**

Support will be given to the development of improved systems for risk assessment, transmission and surveillance of infectious diseases in (and between) humans and animals as well as for studying the development of new methods for medicinal product safety regarding infectious agents. Support will also be given to research on organisational and economic aspects of public health related to infectious diseases, including best practice studies.

2.3.1. Risk assessment, transmission and surveillance. Epidemiological research for the identification of factors (e.g. environmental, genetic) associated to increased risk of infectious disease transmission. Assessment of the infectious risk associated with xeno-transplantation. Research on mechanisms of transmission. Epidemiological research on the evolution from infection to disease to determine optimal intervention strategies. Aetiological and epidemiological research on the role of infections in chronic diseases and in cancer. Methodologies to set-up and evaluate of local, national and Community-wide surveillance systems and early detection of communicable diseases in humans and animals, for example novel pathogens, microbial resistance, nosocomial infections and vaccination coverage. Research providing new tools and epidemiological studies in support of the network for the epidemiological surveillance and control of communicable diseases in the Community (decision 2119/98/EC of the European Parliament and the Council

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<sup>1</sup> OJ C 195, 13.7.1999, p 1.

[http://europa.eu.int/eur-lex/en/lif/dat/1999/en\\_399YO713\\_01.html](http://europa.eu.int/eur-lex/en/lif/dat/1999/en_399YO713_01.html)

of 24 September 1998)<sup>1</sup>. Epidemiological research on notifiable animal diseases and other important animal infectious diseases, including monitoring of presence of infectious agents in wildlife and their transmission to livestock and humans.

2.3.2. Methodologies for medicinal product safety surveillance in the market place. Development and evaluation of: (i) methodologies for risk assessment and quality control against the contamination by potential infective agents of medicinal products, and (ii) methodologies for detection of adverse reactions to vaccines, vaccine components and anti-infective drugs.

2.3.3. Organisational and economic aspects of human and animal health. Research on the efficacy and effectiveness of infectious disease control, including vaccination and antimicrobial containment programmes. Studies on the determinants of public acceptance of community intervention against infectious diseases. Understanding of socio-economic factors and the role of human behaviour in relation to disease prevention, transmission and control, including patient compliance to antimicrobial treatment.

## **KEY ACTION 3: THE “CELL FACTORY”**

### **OBJECTIVES AND DELIVERABLES**

The integration of innovative research and technologies with their exploitation by industry and/or other socio-economic entities in the fields of health, environment, agro-industry, agri-food and high value added chemicals is the aim of this key action. Particular attention will be given to the problem solving approach of strengthening European industrial competitiveness by improving the potential for creation of small research-based biotechnology firms and entrepreneurial initiatives. These knowledge-based new industries are a reservoir of industrial competitiveness, scientific and technological innovation, opportunities for investors, and jobs creation, which is still underexploited in Europe.

An environment in which scientific results could be rapidly exploited and transformed into products and processes of interest to society will be provided, through integrating the whole process of innovation, from advanced research, through technological development up to demonstration. Such an integrated innovation approach is an absolute pre-requisite in this key action, but the exploitation phase may also be a non-industrial one, depending on the particular socio-economic environment associated with a given scientific and technological area, e.g. biosafety research to be used by public-interest organisations, *in-vitro* alternative testing to replace animal experimentation, research results to be used by clinicians and in hospitals.

This key action will therefore mobilise the necessary operators (e.g. scientists, industrialists, venture capitalists, “biovalleys” and “bioincubators” for nurturing start-ups, consumer and patient’s associations, public-interest groups) to address the following objectives in a co-ordinated and convergent way, linking the ability to discover and the ability to exploit:

- **Innovative technologies mobilising mission oriented research.** New knowledge will be generated on the functioning of cells, including GMOs, as biological factories, by advanced research such as functional and structural genomics, proteomics, patterns of metabolites, combinatorial biochemistry, high-throughput screening, nanobiotechnology, structural biology, molecular evolution, bioinformatics, genetic and biochemical engineering. These multidisciplinary technologies applicable to many fields of the cell factories will provide new processes and molecules, for implementing the priorities given in the work programme. In the context of the “*Genome research for human health*” activities, the key action will link these innovative technologies, in particular functional and structural genomics, with exploitation strategies focussing on new diagnostics (3.1.1), therapeutic strategies (3.1.3), and functional biomolecules and biocatalysts (3.3.3).
- **Exploitation of RTD results.** Scientific and technological excellence is necessary but not sufficient. It must be closely linked to a firm commitment to knowledge transfer and to convincing exploitation by industry and/or public interest organisations. Efficient risk capital markets, creation and development of high-tech SMEs, and promoting the dialogue of technology producers with technology users are crucial for linking research to socio-economic needs, leading to future wealth and job creation. The challenge is therefore to set up a nurturing

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<sup>1</sup> OJ L 268, 3.10.1998, p 1.  
[http://europa.eu.int/eur-lex/en/lif/dat/1998/en\\_398D2119.html](http://europa.eu.int/eur-lex/en/lif/dat/1998/en_398D2119.html)

environment both for the development of established bio-industries and for a new generation of European entrepreneurs to start up and flourish.

Towards the anticipated deliverables: improving the competitiveness of established bio-industries and triggering the creation and sustaining the growth rate of new biotech research-based industries, European players should be mobilised to seize opportunities in the following 3 priority areas:

- Improving the diagnostic and therapeutic arsenal for health care.

*Anticipated deliverables: New and improved health related processes and products from living cells and biomolecules, in particular towards diagnostics tests, innovative technologies for biological production, novel targets for drug discovery, novel and improved therapeutics for health care (such as new antibiotics, anticancer therapies...) and development of in-vitro tests as alternatives to animal experimentation.*

- Improving environmental sustainability.

*Anticipated deliverables: More efficient and cleaner technologies for industry, exploitation of industrial by-products and improved methods of treating wastewater. Bioassays for pollution monitoring. Techniques for biodegradation of pollutants and bioremediation. Improved tools for exploiting biodiversity. Methods and strategies for safe introduction, use, monitoring and tracing of GMOs. Contribution to policy development in this area.*

- New biological and biotechnological products and processes for agro-industry, agri-food and high value added chemicals

*Anticipated deliverables: Bio-processes and products offering ecological, industrial and consumer advantages, high value-added products and processes for agro-industry and (bio)chemical sectors, biocatalysts, nanobiotechnology devices, and products derived from improved organisms, including GMOs.*

## ***PRIORITIES FOR THE CALLS IN 2001***

### **Projects must combine excellent science and convincing exploitation strategies**

According to the objectives and problem solving approach of this key action, all projects to be supported must mobilise scientific excellence, innovative technologies and convincing exploitation strategies by bio-industries, entrepreneurial initiatives, hospitals and/or public-interest groups as appropriate, and taking into account the socio-economic context, including the intellectual property rights. The projects must fulfil this absolute pre-requisite. In this respect, “Demonstration” projects are strongly encouraged in all areas of the key action, whenever possible. Depending on their goals, the applicants are also invited to consider either the specific mission-oriented approaches of other key actions or the building up of a new knowledge base in the generic activities. Provided the projects do satisfy the above pre-requisite, they may address a wide spectrum of targets. Consequently, and in order to leave room for innovative ideas from applicants, each of the following RTD priorities only give “aspects for consideration” which are non-exhaustive examples.

Scientific and technological multidisciplinary, e.g. nanobiotechnology, is encouraged and should be clearly highlighted, in order to ensure appropriate evaluation of proposals encompassing several fields, key actions or thematic programmes.

Furthermore, the following strategic activities that span all areas of the key action are specially encouraged, in particular, pan-European initiatives to network biovalleys or bioincubators, strengthen biotechnology entrepreneurship, connect bio-entrepreneurs with investors, encourage research partnerships and interactions between biotechnology firms towards consolidation, link biotechnology research with clinical practice, and analyse GMO safety research and make information broadly accessible. Towards these objectives, the applicants are invited to focus on the “Thematic networks” or “Accompanying measures” implementation modalities.

### **3.1. Improving the diagnostic and therapeutic arsenal for health care**

#### **3.1.1. Development of new diagnostics**

This area is exclusively open for “Demonstration” projects<sup>1</sup>, cooperative research, exploratory awards, training fellowships and accompanying measures. All types of actions are open if the proposals stem from exploratory awards.

Aspects for consideration: new diagnostic tests and procedures aimed at detecting early markers and weak signals in pathology, including near-patient diagnostic tests notably based on nucleic acids, and tests to ensure the safety of biological fluids. Quality control and safety aspects of nucleic acid based diagnostic tests will also be addressed.

### 3.1.2. Therapeutic substances<sup>2</sup>

Aspects for consideration: design and development of new therapeutic substances such as antibodies, antimicrobials, anticancer, and other bioactive compounds to be used in therapy. Improved, safe and efficient production of therapeutic substances, including vaccines, by micro-organisms, plants or animals. Innovative screening of new therapeutic substances, including those based on analysis of complex genetic and physiological data.

### 3.1.3. Therapeutic strategies<sup>2</sup>

Aspects for consideration: Development of nucleic acid and cell therapies, cell and tissue engineering and target specific delivery systems. Development of cell lines for cell mediated gene therapy and of biological substitutes that restore, maintain or improve tissue and organ functions.

### 3.1.4. Novel *in-vitro* testing as alternatives to animal experimentation

Aspects for consideration: reinforcement of pre-normative research, in particular linked to Council Directives 86/609/EEC of 24 November 1986 on the approximation of laws, regulations and administrative provisions of Member States regarding the protection of animals used for experimental and other scientific purposes<sup>3</sup> and 76/768/EEC of 27 July 1976 on approximation of the laws of the Member States relating to cosmetic products<sup>4</sup>, by making cell cultures available as a substitute for animal testing, development of high throughput screening for detecting toxicity, and *in-vitro* toxicity tests, e.g. local toxicity, immuno-toxicity, neuro-toxicology.

## **3.2. Improving environmental sustainability<sup>5</sup>**

### 3.2.1 New bioprocesses for industrial efficiency, to avoid pollution, make use of bioaccumulable wastes and by-products, and treat waste water

This area is exclusively open for “Demonstration” projects<sup>6</sup>, cooperative research, exploratory awards, training fellowships and accompanying measures. All types of actions are open if the proposals stem from exploratory awards.

Aspects for consideration: increase efficiency in energy and raw material use or prevent pollution at source through enzyme or industrial process technologies employing modern biotechnology, for example, by developing novel biocatalysts or designing micro-organisms to carry out specific tasks; modern biological methods to treat waste water for re-use; develop methodologies for assessing “cleanliness” of biotechnological processes and products.

### 3.2.2 Bioassays and biosensors

Aspects for consideration: bioassays and biosensors for fast and efficient warning of pollution incidents, to assay pollution levels and monitor *in situ* remediation, and for detection of GMOs and their products along

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<sup>1</sup> See further information in the roadmap

<sup>2</sup> Where proposals include clinical trials (phase I and II), they will be supported only through “Demonstration” projects. Clinical trial networks (phase III and IV) will be supported only through “Concerted actions” or “Thematic networks”.

<sup>3</sup> OJ L 117, 05.05.1987, p. 31

<sup>4</sup> OJ L 53, 25.02.1977, p. 30

<sup>5</sup> This area deals exclusively with biological tools, techniques and approaches. Projects dealing with wastewater and remediation of contaminated sites (including application of biosensors) where the objective is the technological development of overall systems should be addressed to Energy, Environment and Sustainable Development programme (Key Action 1).

<sup>6</sup> See further information in the roadmap

the production chain.

### 3.2.3 Biodegradation of recalcitrant chemicals and bioremediation

Aspects for consideration: Development of systems to improve bioavailability (e.g. dynamics of micro-organisms in the soil); improve efficiency of biodegradation processes (e.g. biochemistry of anaerobic processes, phytoremediation); exploit biodiversity of biodegradation (e.g. regulation of catabolic pathways); biostabilization of contaminated sites presenting ecological risk; bioaccumulation of pollutants.

### 3.2.4 Biodiversity and ecological dynamics of natural and introduced populations

Aspects for consideration:

- Micro-organisms. Develop methodologies and undertake research to explore microbial biodiversity and exploit micro-organisms in the environment; assess population structure and dynamics, microbial interactions and diversity through development of markers, monitoring and identification strategies; assess environmental impact of novel uses of biodiversity such as soil fertility-enhancing or biocontrol micro-organisms or biopesticides.
- Plants and animals. Development and use of molecular tools for investigating genetic diversity, population structure and population dynamics in agricultural and natural systems. Assessment of gene flow dynamics in agricultural and associated semi-natural or natural habitats, and of possible ecological impact of using transgenic plants and animals; development of exploitation systems to reduce any such impact.

### 3.2.5 Methods and strategies for safe use of new biomolecules and bioprocesses, for identifying recombinant organisms and their residues in the environment and assessing their impact on human and animal health, to support Community policies

Aspects for consideration: Development of accurate, reliable, fast and sensitive methods to provide quantitative detection and identification of specific organisms, particularly GMOs, and their products throughout production and consumption chains and in the environment. Methodologies for assessing and monitoring the presence and effects of GMO and recombinant products used to improve human and animal health, and for their contribution to improving standards in environmental care. Research contributing to the development of criteria and standards for assessing environmental safety of GMO use.

## **3.3. New biological and biotechnological products and processes for agro-industry, agri-food and high value added chemicals**

### 3.3.1. Exploiting the cellular and molecular characteristics of organisms for new nano- and microtechnologies

Aspects for consideration: Nanobiotechnology covering both the application of new scientific tools to biological systems, the use of biological systems as tools in the development of new products and technologies. Studies will be at the level of molecules (e.g. biomolecules self assembly), the coupling of molecules and cells to natural and synthetic surfaces (e.g. control of interactions between proteins and cells and surfaces) and the functional structures (e.g. material processing technologies for nanofabrication).

### 3.3.2. High value-added products and processes involving / derived from micro-organisms, plants and animals

This area is exclusively open for “Demonstration” projects<sup>1</sup>, cooperative research, exploratory awards, training fellowships and accompanying measures. All types of actions are open if the proposals stem from exploratory awards.

Aspects for consideration: Improving the expression of genes for stable and reliable use. Developing more efficient fermentation, bio-transformation, and downstream processing. Using genomic data and reproductive mechanisms. Engineering of the pathways of primary and secondary metabolites of economic importance including the cellular and organ optimisation of compounds. Identifying and developing mechanisms towards resistance against physical and biological stress factors.

### 3.3.3. Functional biomolecules and biocatalysts.

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<sup>1</sup> See also comment in paragraph “PRIORITIES FOR THE CALLS IN 2001” hereafter concerning EMF radiation and cellular phones.

Aspects for consideration: development of highly efficient biomolecules of utmost specificity as well as wide variety and programmable properties, through mobilising structural biology, structural genomics and directed molecular evolution.

#### 3.3.4. Identification and sustainable use of metabolic and genetic diversity as a source of new valuable products.

Aspects for consideration: New or improved methods for screening of marine and terrestrial organisms. Molecular characterisation of wild and domesticated populations, including unculturable micro-organisms, to identify useful products and genes for recombinant production systems. Genetic improvement of wild or under-utilised organisms to introduce them for cultivation or adaptation to new environments.

## **KEY ACTION 4: ENVIRONMENT AND HEALTH**

### **OBJECTIVES AND DELIVERABLES**

The EU is confronted with a substantial increase in environmentally related health issues covering a broad range of health outcomes. There are claims that these issues are related to new, modified and combined exposures to environmental factors. The challenge is to strengthen the scientific evidence by which such claims can be assessed to support informed decision-making by public authorities, industry and individual citizens. Success in reducing environmental health effects needs refined and more effective methods for diagnosis and risk assessment, as well as innovation in the risk management processes. Furthermore, the lack of adequate exposure data and of knowledge on dose-response relationships inhibits the possibilities for better and effective prevention.

This Key Action will create and exploit data and research synergies between relevant disciplines and methodologies in the social, medical, technological, occupational, public health and environmental domains with a view to assessing, limiting and controlling exposure to chemical, biological and physical environmental hazards, including occupational settings. This networking at a European level will contribute towards providing the evidence base for the development of adequate environmental and health policy measures.

- **Reduction of health effects (including allergies) as related to environmental factors:** the objective is to decrease the negative health impacts (as reflected on morbidity and mortality) of environmental factors, in particular noise; indoor and outdoor air pollution; heavy metals; toxic substances; electromagnetic radiation<sup>1</sup> (including ultraviolet radiation) and to gain insights into prevention from a combined environmental and health point of view.

*Anticipated deliverables:* include pan-European databases for relevant exposures and health outcomes; improved co-ordination between existing databases (and their extension to pre-accession countries) and dissemination; improvement of quality, relevance and inter-comparability of both environmental monitoring data and health data; identification of new prevention strategies.

- **Assessment and reduction of environmental health hazards:** the objective is to improve scientific and public knowledge on the links between exposure, health outcome and risk, and the interrelationships with other health risks, taking advantage of the cross-border environmental diversity of the EU. As such it will be possible to better understand, assess and control risks to the population from environmental factors.

*Anticipated deliverables:* include standardised methods for assessing exposure and effect; identification of dose-response relationships between specific environmental exposures and health outcomes; quantification of the relative contribution of routes of exposure (inhalation, food and skin) for relevant environmental exposures; input to European information systems; improved risk assessment methodologies.

- **Support to health and environmental policy-making and public information:** to strengthen the scientific basis for public sector and industrial decision-making in relation to the environmental health effects. This will allow priority setting in environmental and health policy and will support regulatory bodies in their efforts. To strengthen the knowledge base on which the public may make informed

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<sup>1</sup> See also comment in paragraph "PRIORITIES FOR THE CALLS IN 2001" hereafter concerning EMF radiation and cellular phones.

decisions in relation to actual and perceived risks.

*Anticipated deliverables: include support to decision-making in environmental and health policies; improved information on links between environment and health; improved understanding of the socio-economic impact of environmental health effects*

### **PRIORITIES FOR THE CALLS IN 2001**

The priorities for 2001 are grouped under two perspectives. The focus on section 4.1 is on increasing the understanding of the pathways that link exposure to health effect. Section 4.2 aims to provide industry and policy-makers with improved tools to assess and manage risk.

All research topics stated below are open for this Call. However, in order ensure all of the objectives of the Key Action are met and to achieve the deliverables identified, additional focus will be an aim of the calls in 2001 and 2002. Priority will be given to proposals on:

- cognitive effects of environmental exposure (including EMF);
- gene-environment interaction
- in vitro methods for the replacement of animal testing;
- combined exposures;
- indoor air pollution;
- endocrine disruption;
- socio-economic aspects of environment and health issues including determinants of public understanding risk perception and communication

An effective contribution from this Key Action to the emerging European Research Area can be made through the creation of innovative pan-European networks to undertake co-ordination activities (including on databases) and the linkage of Europe's centres of excellence (including to non-E.U. countries). Full use should be made of possibilities provided by thematic network and concerted action modalities and also on Training and on Accompanying Measures (covering foresight studies; mapping of centres of excellence; new dissemination initiatives; etc.). Specific research topics where such actions would be appropriate include - the health effects of: air pollution; EMF; chemical pollution; noise; endocrine disrupters; and, - the environmental influences on allergy and asthma.

The 1999 Call n° 1999/C 361/06 resulted in a satisfactory coverage of RTD projects, on the possible carcinogenic effects linked to EMF (RF) radiation and cellular 'phones. Therefore, this specific aspect will be open in 2001 only for thematic networks, concerted actions, cooperative research, exploratory awards, training fellowships, accompanying measures (and where proposals arise from exploratory awards). However, proposals under all modalities (RTD projects, demonstration projects, combined RTD/demonstration projects, cooperative research, exploratory awards, concerted actions, thematic networks, training fellowships and accompanying measures) are welcomed on other possible health effects of EMF radiation, such as cognitive and other effects, combined exposures and the quantification of exposures.

## **4.1. Diseases and allergies related to or influenced by the environment and their prevention**

### **4.1.1 Analysis and quantification of the impact of environmental factors on human health.**

Aspects for consideration: identification and quantification of the general and occupational environmental factors predisposing individuals to development of environment related health effects and identification of the special needs (including gender specific issues where relevant) of high-risk groups (e.g. occupational groups, children, elderly, susceptible and/or genetically predisposed groups and individuals, socially deprived groups) to improve the potential for reducing the negative effects of the environment on health. Assessment of hormonal and immunotoxicological environmental influences on major disease entities. Identification of causative and modulating factors of allergies to better understand how to combat and prevent allergies (including identification, validation and standardisation of allergens). Studies on the impact of environmental factors on nervous system development and neuro-degenerative diseases. Quantification and understanding of the health effects of climate related exposures. Standardisation of incidence and prevalence of environment

related diseases taking into account geographical and/or climatic variation, to allow comparison of data and interventions at E.U. level.

#### 4.1.2 Assessment of the relative importance of, and the interactions between, factors impinging on health.

Aspects for consideration: study of influencing factors and of pathways of exposure (from air, water or direct contact) to noxious agents and substances to improve knowledge on environment related health effects. Elucidation of such pathways of exposure to single and combined noxious environmental agents. Establishment of mechanistic and dose-response data to better link exposures to effects both from laboratory and from epidemiological studies.

#### 4.1.3 Development of an integrated approach to risk management taking into account environmental and public health aspects.

Aspects for consideration: to quantify adverse health effects and their impact on the European population (with emphasis on health endpoints, including cognitive functions) in order to understand the role of environmental conditions on life expectancy, morbidity and mortality and to facilitate more appropriate public health strategies. To improve quality, relevance and inter-comparability of environmental data and health data, including longitudinal data, to be used to monitor and compare environment and health effects.

Studies for the assessment of the economic and social effects and costs of environmental hazards leading to better priority setting in public health. Improved techniques to address risk perception and risk communication in order to strengthen the knowledge base on which the general public, or specific sub-groups, may make informed decisions in relation to actual and perceived health risks..

## **4.2. Development of new methods of diagnosis, risk assessment and processes to reduce causes and harmful environmental health effects**

#### 4.2.1 Development of methods to assess environmental hazards including mixed exposures, cumulative and low dose effects.

Aspects for consideration: innovative methodologies to investigate and compare the health effects of mixtures of pollutants, toxic substances including solvents and heavy metals as well as combined and low dose effects of agents and electromagnetic radiation<sup>1</sup>. Epidemiological and biomedical studies to determine possible effects (including cognitive effects) and dose-response relationships for noise (e.g. in the domestic environment, from transport sources, in occupational settings, etc) and non-ionising radiation (excluding shared-cost modality for cancer linked to RF exposure). Methods, including mathematical and other types of models, for measuring the relative importance of different factors, routes and rates of exposure to complex environmental mixtures of pollutants.

#### 4.2.2 Improvement of predictive toxicity testing and mechanism-based risk assessment consistent with the aim of the reduction and eventual replacement of animal testing

Aspects for consideration: to improve the toxicological methods, with emphasis on *in-vitro* test systems, and alternative screening and testing protocols to arrive at better diagnosis of health effects and risk assessment of environmental substances or agents harmful to human health. Investigations in intra-species and inter-species variability in order to limit uncertainties and to establish more reliable data sets and to improve the scientific basis for extrapolation from e.g. animal and cell culture data to humans. Development of new screening and testing protocols taking into account existing international chemical and regulatory testing programmes and protocols with emphasis on the need to integrate endpoints.

#### 4.2.3 Improved methods and technologies for long and short-term exposure and effects assessment including biomarkers (and bio-indicators) of environmental exposure, and susceptibility to environmental agents.

Aspects for consideration: identification and validation of the interaction of genetic and environmental risk factors and development of bio-markers allowing to identify exposure, susceptibility and vulnerability to exposure, and to identify early effects (including reversible). Development and application of methodologies and technologies to arrive at better assessment and risk characterisation of short and long term exposures, and of low level exposures including cases where it is not feasible to establish thresholds.

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<sup>1</sup> See also comment in paragraph "PRIORITIES FOR THE CALLS IN 2001" above concerning EMF radiation and cellular phones.

## **KEY ACTION 5: SUSTAINABLE AGRICULTURE, FISHERIES AND FORESTRY, AND INTEGRATED DEVELOPMENT OF RURAL AREAS INCLUDING MOUNTAIN AREAS**

### **OBJECTIVES AND DELIVERABLES**

The aim is to improve the quality of life through the sustainable production and rational utilisation of natural resources with a special emphasis on new technologies, including biotechnology. Applicants should address how European socio-economic and environmental objectives with respect to the sustainability of natural resources can be best met through the relevant scientific and technological advances. A multidisciplinary, integrated approach is desirable, encouraging the active participation of farmers, end-users, consumers and regulatory bodies, with special attention given to the targeted dissemination and utilisation of the results. Research efforts should aim to address the following objectives:

- **Competitiveness with its direct implications for (i) employment and conditions in rural and other relevant areas; (ii) reduction of the vulnerability of the relevant sectors through diversification; (iii) the response to societal demands for sound environmental practices and (iv) the sustainable production of renewable resources.** Research will contribute to support the implementation of the evolving Common Agricultural Policy (CAP) and Common Fisheries Policies (CFP) and their adaptation to the limited availability of natural resources, the evolving societal needs and demands, the evolving world trade situation and globalisation of markets and E.U. enlargement. It will also support the implementation of international commitments and Community measures on the protection and sustainable management of forests and other living resources.

*Anticipated deliverables:* (i) objective information in support of farming, fishing and forestry production systems, of integrated rural development, of policy orientations and Community measures; (ii) tools and methods to foster, assess, measure and monitor competitiveness and sustainability of agriculture, fisheries and forestry, improvements of products quality and employment prospective; (iii) tools and methods to anticipate the need for adaptation of policy instruments, to implement and monitor these instruments, to foster integrated rural development; and to reduce negative impacts on the environment or to enhance societal benefits of the agriculture, fisheries and forestry sectors; (iv) the assessment of the effectiveness of these tools, methods and policy instruments. (v) a clearer analysis of current EU and National agriculture, fisheries, and forestry research policy, which can help shape a clearer vision of future trends.

- **Sustainable management and utilisation of biological resources.** Research will strengthen the technical and economic competitiveness of bio-based industries through integration of various scientific disciplines taking into due consideration the vulnerability of both environment and resources and, coherently encompassing current and future markets, processes and production practices. This will allow for a better realisation of the economic, social and environmental benefits arising from the sustainable management and responsible utilisation of biological resources.

*Anticipated deliverables:* Research will provide for sustainable production and clean and efficient process technologies which will lead to the delivery of new or improved products with high-value added and lower impact on the environment. It will expand the production and use base of biological raw materials through integrating raw materials production with industrial and market needs.

- **Products and processes complying with consumer well-being and quality requirements.** Research will focus on factors affecting the delivery of high quality products considering all aspects of production and processing, including final product characteristics, safety aspects and market requirements.

*Anticipated deliverables:* Research will provide the scientific and technological basis for the development of new or improved products, corresponding to consumer requirements, and delivered with detailed data on life cycle, recyclability, cost analysis, safety and product performance.

The creation of innovative pan-European networks involving all appropriate actors will be required to achieve all the above objectives and deliverables and will contribute to the emerging European Research Area. The use of the implementation modalities available, Concerted Actions, Thematic Networks, Accompanying Measures, Training, should be fully exploited as a way of facilitating such networks.

## ***PRIORITIES FOR THE CALLS IN 2001***

### **5.1. New and sustainable systems of production, including breeding methods and exploitation in agriculture, fisheries and aquaculture, taking into account profitability, the sustainable management of resources, product quality and employment as well as animal health and welfare.**

#### **5.1.1. Sustainable agriculture**

New and improved or adapted farming systems that contribute to the sustainable development of regions.

##### *Farming systems :*

Research will focus on new and improved farming systems, also covering new crops and horticulture, farm animals and their associated support tools, including genome analysis, encompassing the whole production process and which combine economic competitiveness, optimal use of inputs, consideration of animal welfare in stock farming systems, product safety and quality, protection and enhancement of the environment, biodiversity, landscape and habitats and rational use of soil and water, while considering employment. Proposals dealing with new technologies based on molecular biology and information technologies that serve as a powerful tool for improving agricultural production and farming systems are invited.

- *Conventional farming systems:* Crop and animal production systems giving optimal output of high quality products, while meeting the above mentioned characteristics.
- *Organic farming systems:* Solutions for conversion to such systems and means to overcome existing obstacles; support to identification and control including traceability; market analysis; strategies for higher product value; development of technico-economic references and support to E.U. legislation.
- *Integrated farming systems:* Production systems giving optimal output of high quality products, using as much as possible natural regulation mechanisms and products with improved genetic material where appropriate, thus reducing levels of chemical inputs.

In the context of the above mentioned agricultural systems, particular attention will be paid: to the comparison of profitability and convenience of genetically modified and of non-genetically modified crops at production level in the short and the long term; to the cascading effects of GM crops introduction on up- and downstream sectors; to the technical and socio-economic issues concerning segregation; to the comparison of the use of agrochemicals in the cultivation of genetically modified crops with that of conventional crops; of the non target effects of genetically modified crops with those of agrochemicals; of the gene transfer from genetically modified crops or micro-organisms with that of conventional crops. There is also a need to understand more fully the impact of the different farming systems on the environment, as well as the socio-economic implications when compared to conventional systems. Indicators must be developed and/or improved to assess and monitor the progress made in improving farming systems, and the potential negative effects need to be reduced and potential benefits enhanced. In addition proposals addressing safety and traceability issues concerning animal feed production and contamination, as well as production and contamination at the farm level, are encouraged. How the above farming systems can best operate within a multifunctional agriculture structure needs to be investigated.

##### ***Sustainable management of resources in agriculture***

Environment-friendly waste management and recycling and sustainable use of off-farm waste; reductions of emissions and pollutants of all kinds; the effect and fate of chemical inputs; the development of technical solutions to avoid unforeseen risks and spread of genes; the measurement of persistence and effects of DNA in the environment (including the soil); the protection of landscape and natural areas in relation to agricultural production.

Protecting and improving the genetic diversity in agriculture requires improved methods of germ-plasm conservation and analysis along with the establishment of a long term definition of desirable and undesirable traits and a better co-ordination between E.U. and international levels; market analyses and identification of ways to derive income from genetic diversity conservation.

The investigation of ways to link DNA sequencing and gene mapping in plants and animals with the

exploitation of desirable characteristics, while taking into account the viewpoint of the producer and the consumer, are invited.

The sustainable use of soil and water resources<sup>1</sup> will be promoted through the prevention of erosion, salination and groundwater spoilage; agricultural systems adapted to extreme conditions and the development of innovative, and efficient irrigation systems, water re-use and recycling.

### ***Plant health***

Research on plant health will focus on support for Community policy objectives. It will target quarantine organisms, organisms which are specially harmful or difficult to control in agriculture, and those which pose a threat to the free movement of goods and services. New rapid reliable cost-effective, and safe products, tools and methodologies are needed for the detection, control and (where appropriate) eradication of these organisms; for their classification, forecasting (including farm level decision support systems) and risk assessment; for preventing or controlling these organisms and their negative effects, including at the post harvest stage; and for analysing the impact of agricultural crop protection methods on the environment and the food chain.

Special attention will be paid to the use of biotechnology and other scientific disciplines, for improved health of plants in organic, integrated as well as conventional agriculture. In particular, improved understanding of novel and innate defence mechanisms of plants and ecosystems will be used in plant breeding and biological control. Special emphasis will be placed on the replacement of protection methods, which may have adverse effects on environment and health, particularly those methods which have recently been or which are about to be withdrawn.

Projects must foresee transfer of the results to economically active end-users and therefore examine relevant socio-economic aspects and all complementary multidisciplinary quantitative studies whose results will be needed at the point of use. These results include as well as practical questions of implementation at farm level, knowledge of acceptable (non-zero) levels of the pest or disease, and of the real costs and risks of new and existing control measures.

### ***Health and welfare of animals used in farm livestock production***

In addition to the issues addressed in the Key Action "Control of infectious diseases", RTD proposals will focus on: identification and evaluation of more resistant animals; contaminants and toxins present in feed; harmonised scientific parameters and analytical methods to ensure high quality feed and public health; Hazard Assessment Critical Control Points (HACCP) in the feed production chain; the role of livestock nutrition in determining the quality of meat; the effect of promoters on meat and milk including the implications for public health, animal health and welfare and farming systems; other serious animal health problems such as the impact of endocrine disrupting agents; improved methods for evaluating the impact of veterinary products on public and animal health: development of strategies for reducing antibiotic use in animal husbandry.

To improve animal welfare, a better assessment of welfare requirements is needed, along with the assessment and improvement of animal welfare from housing to slaughter (including transport) and the relationship between animal welfare and product quality. Innovative breeding targets taking account of animal welfare will be researched. Methodologies and indicators for an integrated assessment of existing husbandry systems and the development of new ones will be sought.

On the socio-economic side research will focus on the impact of E.U. standards for health and animal welfare on the external competitiveness of European agriculture; in particular methodologies to compare these standards with those of our main international partners should be looked at. It should also look at the international legal/regulatory framework, in particular the possibility to differentiate agricultural products complying with higher health and animal welfare standards.

### ***Quality policy. Agricultural products and farm-processed products***

Focus on the analysis of consumer expectations and behaviour with regard to agricultural products and products processed on the farm, including those using GMOs, along with their potential market share; on the development of appropriate technologies for small scale production of agricultural products processed on the farm; on an overall support to production branches producing "quality products" as laid down in Community

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<sup>1</sup> Proposals dealing with the integrated management of water resources should be addressed to EESD Programme, Key Action 1

legislation, including the implementation of the “Total quality” concept throughout the production and marketing chain. Methods for measuring and controlling quality and comparing quality and standards of controls in Member States for monitoring and control of the application of Community rules on quality foodstuffs. Collection and analysis of consumption data for the most important agricultural commodities.

#### 5.1.2. Sustainable fisheries and aquaculture

##### ***Interactions between environment, fisheries and aquaculture<sup>1</sup>***

Research will focus on methods and strategies to assess or reduce, where undesirable, the effects of the interactions between environment, fisheries and aquaculture. It will improve our understanding of the impact of environmental changes (whether induced by humans activities or not) on the dynamics of commercially harvested living resources and on aquaculture, with particular emphasis on the effects of toxic algae. To improve the understanding of the impact of fisheries on the marine ecosystems, it will concentrate on the foodwebs, on the physical impact of fishing gear on the seabed, on the demographic structures of exploited fish stocks and by-catches, and on genetic diversity. Furthermore, it will aim at defining specific targets for the protection of biodiversity. As for aquaculture, it will focus on the effects of farm effluents and on the interactions between wild, farmed and ornamental organisms with special emphasis on genetics, including GMOs, and diseases.

##### ***Scientific basis of fisheries management***

Research will concentrate on the improvement of management tools and on the relationships and interactions between biological, economic and fleet capacity aspects of resource assessment and management, including data requirements. This includes the improvement of available assessment methods used for formulating scientific advice to management, with particular emphasis on the less known resources, the assessment of risks and uncertainties associated with the models, as well as the development, application and/or validation of methods to establish the geographical limits and genetic structure of fish stocks.

##### ***Improvement of aquatic production***

Priority will be granted to multidisciplinary research efforts encompassing various fields of aquaculture genetics and related areas and the clarification of essential biological functions benefiting aquaculture production, including the corresponding genetic bases and heritability. The development of tools to facilitate the identification of suitable source populations with profitable traits including genome mapping and its application will be promoted, with a view to integrate such tools and populations to selective breeding programmes. Research will investigate the influence of nutrition, environment and husbandry on the health of farmed species. It will also address the technical and economic potential of species diversification and technological innovations such as offshore aquaculture, including their environmental aspects. The co-ordination of research for alternatives to fishmeal and fish oil in fish diets will be supported.

## **5.2. The integrated production and exploitation of biological materials for non-food uses**

A long-term goal is to prepare the foundations for the bio-based industries of the future, thereby addressing industrial sustainability and the depletion of fossil resources. The more immediate goal of this key action is thus to develop alternative industrial materials from biological materials which will offer diversified opportunities for farmers, and renewable industrial intermediates and products to the end user and consumer. Market feasibility is a pre-requisite for success along the complete integrated production, processing, utilisation and disposal chain, thus a strong industrial participation, linked where applicable to the potential impact on agriculture is essential for selection. Research and development will focus upon primary production systems (including storage and transport) and the physical, chemical, and biological, transformation and processing of material from plants, animals and microbes (including organic waste material), to produce higher added value, and large volume products. The key issue of economic competitiveness in comparison with products derived from fossil resources has to be addressed. Industrial product sectors to be targeted include: Biopolymers and additives for packaging and construction (films and fibres); Bulk chemicals such as lubricants, solvents, detergents and surface coatings; Fine chemicals for personal care, flavours, agrochemicals and pharmaceuticals; and Biofuels for the energy and transport

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<sup>1</sup> Proposals on marine ecosystems functioning should be submitted to Thematic Programme 4 (KA3 – Sustainable Marine Ecosystems), while proposals likely to contribute to the implementation of the Common Fisheries Policy should be submitted to Thematic Programme 1 (KA5 – Sustainable Agriculture, Fisheries and Forestry)

sectors.

*The Raw Materials:* Agricultural production systems for biological raw materials matching non-food industrial requirements and demand with respect to quality, security of supply, sustainable land management, the environment, and conservation of biological diversity, should be developed. Projects should aim at optimising yields of valuable molecules and materials through conventional and recombinant genetics. Storage and transport systems which preserve and increase the recovery of valuable components should be developed including near point of production processing technologies, which add value, reduce costs, and improve whole crop utilisation. Information on the true market and economic prospects for industrial renewable materials must be developed with respect to production and processing costs and identifying market outlets. Ways to integrate non-food crop production with traditional food production systems and to consolidate the industrial need with the agricultural supply and the needs of rural communities will be sought. At primary production level research will focus more specifically on the energy balance as well as on the environmental balance, of the production of these crops. Moreover, the conditions for economic profitability of these crops should be assessed.

*The Factory:* Product oriented research will focus on the physical, chemical, and biological extraction and modification of oil, protein, starch, sugar and fibre material from plants, animals and wastes to produce bulk or fine chemicals, biopolymers, and biofuels. Improved processing technologies are sought which enhance the recovery of purer products. This includes addressing the problems associated with scale-up processes, the adaptation of conventional processing technologies, and the modification of functional groups, along with the processing of biologically based wastes.

*The Market:* Biomaterials with enhanced performance will be demonstrated and the results applied in the promotion of recognised standards codes and guidelines for the consumer and end-user. Ways to make Life Cycle Analysis for renewable bioproducts more objective, and comparative are invited. Consideration should be given to scale-up processes, pilot production, and market tests of bioproducts with respect to performance aspects such as permeability, absorption, oxidation, viscosity, temperature stability, safety energy balance etc. Sectoral market studies addressing the key barriers to larger market penetration of renewable bioproducts are welcome.

### **5.3. Sustainable and multi-purpose utilisation of forest resources; the integrated forestry-wood chain**

#### 5.3.1. Multifunctional management of forests

RTD proposals will focus on the following:

- *The support to the pan-European forestry policy processes and socio-economic aspects needs* strategies and options at E.U. level for the implementation of international commitments; instruments for a concerted approach to the sustainable development of forestry; evaluation of non-marketed forest goods and services and the contribution of forestry to rural development; public perceptions on the use and management of forests and on their role in the society; strategies such as certification, to enhance the value of forest resources, and services.
- *The sustainable multifunctional management of forests* requires improved criteria and indicators. Improved understanding of the functioning, biodiversity and stability of different forest ecosystems and of the interactions between forestry activities and other land uses will be sought. Also to be considered are cost effective multifunctional management systems ensuring proper levels of biodiversity as well as methods for improving the value of non-wood goods and services. Finally the development of sustainable management systems adapted to particular local or regional conditions is to be investigated.
- *Community forestry measures* need improved tools for their analysis and evaluation, and communication.
- *The protection, conservation and restoration of forest ecosystems* require appropriate monitoring methods and tools, adequate strategies and measures for the prevention against, and control of biotic (pests, diseases) and abiotic damaging factors. Research on prevention and control of forest fires as well as on quarantine and other harmful organisms posing a threat to the free movement of products will also be included. The role of forests on water management, erosion control, desertification and prevention of avalanches and landslides will be addressed. Research will also cover the specific problems of urban forestry and the impact of climate change on forests, along with adaptation to climate change. Forests as a carbon sink require special

attention<sup>1</sup> (carbon cycles, CO<sub>2</sub> sequestration, etc.)

- *Agroforestry, cork, energy production, silvopastoral and production systems for other than wood purposes including tourism and recreation*, Research will address the development of advanced management and harvesting systems including short rotation forestry and small-scale forestry. Biomass production systems for energy including small-scale use will be developed. With respect to cork, there is a need for better understanding of the mechanisms of cork formation and of the physiological; silvicultural and environmental factors affecting cork quality. The contribution of the above systems to rural development and employment will be studied. Finally, the role and the specific requirements of urban forestry will be addressed.

### 5.3.2. Strategies for the sustainable and multipurpose utilisation of forest resources; the forestry-wood chain

- *Sustainable and diversified forestry production meeting market needs*. The industrial need for the supply of high quality and uniform raw material will be addressed through the assessment and management of genetic resources taking advantage of modern biotechnological methods. Genetic physiological, biomechanical and silvicultural processes, which affect quality, will be studied. The development of forest management systems will be sought; in particular through advanced decision support tools (e.g. advanced forest inventory methods and growth and yield models combining spatial and temporal information) and integrated supply systems and models linking raw material characteristics with market needs. The eco-efficiency of forest operations including forestation techniques and harvesting systems will also be studied.

- *Environmentally friendly and efficient processes, recycling technologies and improved value-added products*. RTD proposals will focus on new and improved process technologies and control systems aiming at increased value yield, reduced waste, water and/or energy consumption. With respect to wood and wood based products, the relationships between the composition and quality parameters of wood with the properties of wood based products will be studied. The impact of wood properties on processing, along with optimised recycling technologies will be investigated. The development of innovative, modified, and engineered products with enhanced properties will be considered. Concerning fibre-based products including pulp and paper, the material specifications of the fibre, its characterisation as well as fibrous networks with the aim of developing new or improved end products will be studied. There will also be focus on new processes for fibre modification and fractionation, clean processes including biotechnological approaches and closed-loop technologies, recycling technologies, less capital intensive processes, along with the enhancement of paper's functional properties.

- *Market requirements and final product characteristics*. Factors affecting the delivery of high quality products will be studied, such as labelling, comparative Life Cycle Analysis studies encompassing all steps from primary production to end-products, product performance including pre-normative research as well as the adaptation of Total Quality Management practices to the forestry-wood chain. Novel markets and product outlets will be identified. The contribution of the forestry-wood chain to rural development will be substantiated through socio-economic analysis as well as the sector's competitive position in a European and global context.

## **5.4 Support for common policies – Development of methods of control, surveillance and protection including protection of land and prevention of soil erosion. Pre-legislative research designed to provide a scientific basis for Community legislation.**

5.4.1. Community agriculture and the international context. International trade discussions and the settlement of disputes require scientific support. Farm policies in the main World Trade Organisation (WTO) countries, with attention to: support schemes in favour of agriculture; tariff barriers for agricultural products and non-tariff trade barriers in particular to analyse the role and impact of state trading enterprises and monopolistic trade board; the impact of different export regime policies, e.g. export credit policy, food aid; the impact of regional and bilateral free trade agreement, in particular in the case of Mediterranean third countries, and their relationship with a multilateral approach. Trade related issues on intellectual property rights (TRIPs) need analysis both for the EU and the other WTO participating countries, along with the agricultural and agribusiness sectors in the Central and Eastern European Countries (CEEC), Mediterranean third countries and Mercosur and the consequences and needs arising from the inclusion of CEECs in the

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<sup>1</sup> Proposals dealing with the quantification and assessment of biospheric sources and sinks of carbon and nitrogen (Kyoto Protocol) will be dealt with in the EESD Programme, Key Action 2.

CAP.

5.4.2. CAP measures and related activities including agri-environmental and socio-economic aspects need improved normative and pre-normative tools (ex-ante and ex-post) for assessing and controlling CAP measures, agricultural production, landscape, water utilisation, the protection of land and prevention of soil erosion as well as the quality of products and products processed on the farm; forecasting the development of agriculture and related sectors, identifying the necessary adjustments in the CAP and evaluating the potential impact of policy decisions; the improvement of existing general models and development of smaller ones adapted to sectoral needs. The potential of and constraints to the development of producer organisations should also be further analysed. Analysis is also needed regarding the possible development of risk-management tools in the E.U. (in particular agricultural insurance and safety nets), their economic efficiency and place in the overall policy framework and the role and opportunity of public intervention, and the efficiency of the transmission of prices changes in the agri-food sector, in reference particularly to the degree of competition/concentration along the agri-food sector (based on specific sectoral studies). Moreover the implementation of Agenda 2000<sup>1</sup> require improved and innovative evaluation tools in particular on production and environment. Finally, the analysis of interactions between agriculture, environment and CAP measures is necessary in order to allow an efficient distribution of support for environment in rural areas overcoming possible present weaknesses, and allowing for an understanding of the legal economic and behavioural aspects needed to overcome barriers hindering acceptance and implementation of such measures.

5.4.3. Monitoring and enforcement of the CFP: Research will focus on improving the collection and interpretation of data for resources assessment and management and on anticipating the reactions of economic and social sectors to regulations. It will develop cost-effective methods to ensure implementation and enforcement of regulations (such as technical measures, fishing effort and fishing capacity limitations) and will improve efficiency and accuracy of resource assessment and monitoring. It will also develop methodologies to establish traceability in terms of legally indisputable evidence for the origin of fish and fish products and to monitor and control the risks of emerging diseases in aquaculture in particular viral induced diseases.

5.4.4. Social and economic basis of the CFP: Research will develop methodologies to identify and analyse the processes affecting the different sectors of coastal communities from a socio-economic point of view. In this context it will assess the economic consequences of interactions between resource management, structural interventions, market support mechanisms and financial incentives in the different economic sectors. It will assess the compatibility of different biological, economic and social objectives of fisheries management, and will compare alternative management strategies.

## **5.5. New tools and models for the integrated and sustainable development of rural and other relevant areas**

RTD proposals are invited to develop options strategies and policies for the integrated development of regions. A balanced implementation of sectoral and territorial aspects of the CAP and an adequate participation of relevant (non-agricultural) stakeholders is aimed at.

5.5.1. Analysing rural situations, changes and trends, require for each type of rural areas, multi-sectoral analyses; identification of strengths, weaknesses, opportunities and threats as well as the development of scenarios and the analysis of rural-urban interrelationships and typologies of areas, to identify meaningful spatial entities for development analyses. Actions being undertaken in endogenous and exogenous rural development approaches will be investigated with a view to establish models of effective practice and their transferability across regions of the EU. Landscape management with respect to important ecosystems, habitats, cultural heritage and recreational activities will be addressed as well as the current situation and prospects of multifunctional agriculture, together with new indicators and parameters for assessing the relative importance of agriculture and forestry. A key research area concerns the nature of multifunctional agriculture and its impacts on rural economies and farm families as well as relations with changing consumer demands and changes in marketing and processing. Defining the European concept of multifunctional agriculture is a key issue for trade policy and enlargement, as well as future rural policy development. This includes issues of environment, food security quality and safety, and animal welfare, which are key areas

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<sup>1</sup> [http://europa.eu.int/comm/agenda2000/index\\_en.htm](http://europa.eu.int/comm/agenda2000/index_en.htm)

linking agriculture with rural economies and viability, rural environment, tourism, and consumers. In addition tools and methods to assess the contribution of agriculture forestry aquaculture and fisheries to the development of rural coastal areas and their socio-economic interactions with other competing sectors will be developed.

5.5.2. Conceptualising integrated development of rural and other relevant areas, implies understanding the potential of new information and communications technologies for the development of rural economies; the impacts of infrastructure and public services; the role of rural amenities, cultural and natural heritage; the emergence of entrepreneurship in rural areas; the rates of new enterprise formation and survival, especially micro-enterprises; restructuring in the global economy through deregulation and trade liberalisation and its impact on rural areas; the impacts of restructuring in rural public and private services; market reorganisation and its impact on production and marketing in disadvantaged rural regions. Options and strategies for integrated resource utilisation in different rural regions will be developed, as well as methods to obtain participation of population and local actors in rural development processes, and strategies and tools for the transfer of experience, innovation and knowledge. The relationships between regional urban and rural policies, and those between social (including social inclusion), economic and environmental policies, need to be defined and coordinated. The analysis and evaluation of gender issues in rural areas need to be evaluated and studied.

5.5.3. Assessing rural and coastal development performance and policies, implies improvement of specific tools for baseline description, forecasting, monitoring and evaluation of projects, measures, programmes and policies, including for those related to the improvement of agricultural structures; comparative efficiency analyses of institutional structures and procedures in order to define the appropriate levels of intervention and patterns of partnerships; changes perceptions and attitudes concerning rural development issues; the role of social capital, performance of institutions, the functioning and significance of internal and external networks of enterprises and other actors, the quality of life including social inclusion, the performance of markets, territorial and cultural identity and image, local participation and empowerment as preconditions for rural development strategies; synergetic effects and improved methods for measuring positive and negative externalities of rural development; development and application of tools and methods to assess regional or local impacts exerted by structural aids to the agriculture forestry fisheries and aquaculture sectors. Finally the effects of policies on population and the provision of public services in rural areas needs to be studied.

## ***KEY ACTION 6: THE AGEING POPULATION AND DISABILITIES***

### ***OBJECTIVES AND DELIVERABLES***

The ageing of Europe's population will be a crucial challenge for the 21<sup>st</sup> century. Society will have to face three major issues: first, increasing numbers of active older people demanding new social structures and opportunities; second, increasing numbers of disabled older people requiring new interventions and improved health and social care with the resulting economic consequences; and third, complex economic, technological, organisational and social challenges involved in the ageing of society. For society to cope with and indeed benefit from these changes, innovative social, organisational and technological responses are needed.

A global objective of this key action is to raise the issue of "The Ageing Population" as a priority subject for Community-wide cross-sectoral multidisciplinary research, combining and integrating efforts in the biological, biomedical, psychological, economic and social fields. More specific objectives and deliverables are:

#### **- To promote healthy ageing**

*Anticipated deliverables: identification of major factors governing the ageing process as a means of promoting healthy ageing, delaying the onset of disability and preventing frailty.*

#### **- To improve the management of age-related illnesses and to cope better with disability**

*Anticipated deliverables: improved methods to prevent, delay the onset, diagnose and treat major illnesses and disabling conditions of older people; more competitive and adapted technological products and services for coping with disability and for promoting the quality of life, autonomy and social integration of older people.*

- **To improve the basis for the policy and planning of social welfare systems**

*Anticipated deliverables: improved tools for analysing the implications of population ageing on the sustainability of social welfare systems; improved and economically sustainable modes of delivering health and social care to older people.*

To date, health systems have been largely oriented to extending life. This key action will focus more on reducing morbidity and coping with disability, targeting the development of treatments, technologies and systems to prevent incapacitating diseases, to extend the quality of life and to enhance the functional independence of older people.

This key action adopts a problem-solving approach, in which it aims “to put research to work” to meet the challenges posed by both the ageing of individuals and the ageing of society. It aims to do so by taking a well-balanced holistic approach towards the challenges of an ageing population, sponsoring research across all five action lines described below.

### ***PRIORITIES FOR THE CALLS IN 2001<sup>1</sup>***

#### **6.1. Age-related illnesses and health problems**

This action line focuses on creating European added value in research of clinical significance for the early detection, prevention or delay in onset, and treatment of age-related diseases and disorders of high morbidity among older people. In particular, it will sponsor the coordination of research projects already funded at the national and international levels and the networking of research teams with the stakeholders in the research. Priorities are:

- comorbidity, including multiple minor disorders;
- nervous system: stroke, Alzheimer’s disease and other forms of cognitive impairment, depression, Parkinson’s disease and peripheral neuropathies;
- musculoskeletal system: osteoporosis and degenerative joint diseases;
- urogenital system: incontinence and prostate disorders;
- sensory systems: visual and auditory impairments;
- pain.

This action line will support concerted actions, thematic networks, cooperative research, exploratory awards, training fellowships and accompanying measures in all of these priority topics<sup>2</sup>. In addition, for the year 2001, RTD projects and demonstration projects will be supported on visual and auditory impairment, comorbidity, depression and incontinence<sup>3</sup>. (For the year 2002, a different set of topics will be open for support as RTD projects and demonstration projects: these will include the musculoskeletal system).

Successful proposals must contain a strong representation from clinical research. Thematic networks that bring together the research sector with the health and social care sectors and with representatives of older people are encouraged, particularly with a view to stimulating the formation of multidisciplinary, cross-sectoral RTD proposals to later calls for proposals.

#### **6.2. Determinants of healthy ageing and of well-being in old age**

This action line aims at improving understanding of the social, cultural, gender, biological (including genetic) and behavioural factors governing the ageing process (including lifestyle, nutrition, physical activity, social environment, education, and financial and other resources) in order to strengthen the evidence base for public

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<sup>1</sup> Please note that other age-related research topics are covered elsewhere in the “Quality of Life and Management of Living Resources” Programme, for example, cardiovascular disease and cancers in the Generic Activities, nutrition in Key Action 1 and vaccination strategies in Key Action 2.

<sup>2</sup> All types of actions are open provided the proposals stem from exploratory awards.

<sup>3</sup> Phase I and phase II clinical trials may be supported as demonstration projects, concerted actions or thematic networks. Phase III and phase IV clinical trials will however be supported only as concerted actions or thematic networks. All types of actions are open provided the proposals stem from exploratory awards.

health strategies to promote both healthy ageing of the population at large and the well-being, autonomy and independence of older people. Priorities are:

- the socio-economic, cultural, psychological and behavioural determinants of healthy ageing and of well-being in old age;
- the biological mechanisms underlying the physiological processes of ageing, including menopause and declining male sexual endocrine function (but excluding the pathogenesis of specific diseases);
- epidemiological studies, including longitudinal and cohort studies (in particular, of the oldest old), on the determinants of healthy ageing and of expectations and well-being in old age.

The action line will support RTD projects, concerted actions, thematic networks, cooperative research, exploratory awards, training fellowships and accompanying measures<sup>1</sup>. Studies of determinants should, as far as practicable, involve relevant health and social care practitioners and representatives of older people.

### **6.3. Demographic and social policy aspects of population ageing**

As a basis for socio-economic policy and planning in the light of the demographic changes that are expected, this action line concentrates on predicting the evolution of pertinent characteristics of the ageing population and on examining the impact of population ageing on society. Priorities are:

- population studies aimed at predicting policy-relevant characteristics of an ageing population (including functional status, health and care status, dependency, housing and household status, economic status);
- socio-economic and socio-demographic studies on the factors influencing the ageing of the population;
- policy-relevant socio-economic studies on the impact of population ageing: (a) on the sustainability of social welfare systems, in particular health care and pensions; (b) on social cohesion; (c) on the participation of older workers in the labour market; and (d) on the development of the voluntary and community sectors.

These aspects will be supported through RTD projects, concerted actions, thematic networks, cooperative research, exploratory awards, training fellowships and accompanying measures<sup>1</sup>. Comparative analyses at national and regional levels addressing the diversity of socio-economic and cultural contexts across Europe are encouraged. Projects should involve, as far as practicable, representatives of older people and, where appropriate, the social partners.

This action line will also support, through thematic networks, transnational cooperation on the development of comparable data sets needed for Community-wide studies of the socio-economic impact of population ageing.

### **6.4. Coping with functional limitations in old age**

This action line supports the development and evaluation of technologies and systems designed to reduce the impact of disabilities on older people, to restore their functions and to mitigate the challenge to them of their social and physical environments. Priorities are:

- technological products and systems contributing to greater mobility and less dependency, both inside and outside the home, including in the work-place;
- caring and nursing products designed to support older people in their own homes;
- stimulating the capacity for self-care by older people;
- improving postural stability and preventing falls;
- geriatric rehabilitation strategies and technical aids to rehabilitation;
- optimum forms of physical and/or cognitive exercise.

This action line is complemented by work in the Key Action on Systems and Services for the Citizen in the Information Society Technologies Programme and therefore excludes support for projects where the

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<sup>1</sup> All types of actions are open provided the proposals stem from exploratory awards.

predominant activity is the development or application of new information, communication or robotic technologies. However, the application of such mature technologies will be considered within the scope of this action line.

The action line will support RTD projects, demonstration projects (in particular, for the evaluation of new technologies and services), concerted actions, thematic networks, cooperative research, exploratory awards, training fellowships and accompanying measures<sup>1</sup>. Projects should be application-oriented and should take full account of the best principles of ergonomics and design. They should also involve, as far as practicable, the active participation of industry and of end-users.

### **6.5. Health and social care services to older people**

This action line aims at contributing to the evolution of effective, efficient and user-friendly care services for older people, by supporting comparative evaluation and research into the organisation, delivery and planning of care. Priorities are:

- the efficiency, quality and user-acceptability of different modes of health and social care organisation and delivery (with particular emphasis on their interfaces);
- the role and needs of care-givers, particularly family and friends and the voluntary sector, and their relation to the formal care sector;
- arrangements to enable older people to stay in their own homes, particularly by extending domiciliary care, by integrating services at the local level, or by promoting different housing structures and living environments;
- end-of-life care.

The action line will support RTD projects, demonstration projects, concerted actions, thematic networks , cooperative research, exploratory awards, training fellowships and accompanying measures<sup>2</sup>. Comparative analyses should take advantage of the diversity in health and social care at national and regional levels, addressing the different social, cultural and institutional contexts across Europe. Projects should involve, as far as practicable, health and social care practitioners and representatives of older people and of their carers.

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<sup>1</sup> Phase I and phase II clinical trials may be supported as demonstration projects, concerted actions or thematic networks. Phase III and phase IV clinical trials will however be supported only as concerted actions or thematic networks.

All types of actions are open provided the proposals stem from exploratory awards.

<sup>2</sup> All types of actions are open provided the proposals stem from exploratory awards.

## **RESEARCH AND TECHNOLOGICAL DEVELOPMENT ACTIVITIES OF A GENERIC NATURE**

These activities aim to reinforce the knowledge base in chosen areas of strategic but generic importance for the Life Sciences related to humans, animals (both terrestrial and aquatic) and plants. This is in contrast to the mission oriented problem solving approach in the Key Actions, which place the emphasis on the linkage between discovery and exploitation.

Projects will be encouraged that promote interaction between basic and applied research and that involve both the research and health sectors in order to ensure maximum transfer of knowledge between research and its users, including industry, as well as to make a contribution towards the development of policy, for example, public health. The networking of projects will also be promoted in order to create a critical mass for optimum exploitation of results.

### ***SCOPE OF THE YEAR 2001 DEADLINES***

There will be two deadlines for RTD projects, demonstration projects, combined RTD/demonstration projects, concerted actions and thematic networks regarding activities of a generic nature in 2001, one on 28 February concerning Areas 12 and 13 alone, and a second on 18 October 2001 for all Areas, except 7.1, 8.1, 8.2, 9.1 and 9.2.

In addition, a call for expression of interest with a deadline on 9 February 2001 and a subsequent dedicated call for proposals with a deadline on 18 October 2001 will be published in area 8.5.

The recent publication of the draft sequence of the human genome and the foreseen implications for medicine and human health are being addressed by a Commission initiative on genomics and human health. In order to highlight this initiative, relevant parts of this work programme are written in *italics*. In particular, an additional action line 8.5 entitled “Integrated projects in genomics and human health” has been introduced.

## ***7. Chronic and Degenerative Diseases, Cancer, Diabetes, Cardiovascular Diseases and Rare Diseases***

### ***OBJECTIVES***

The main objective of this activity is to reduce the impact of human multifactorial diseases<sup>1</sup> both on individuals and populations by fostering the integration of basic and clinical research aimed at: a) elucidating the contribution of the cellular, molecular, genetic, environmental and lifestyle factors which determine disease; b) integrating different disciplines and advanced technologies to develop effective approaches to prevention, diagnosis and treatment.

Many of these diseases share a common multifactorial aetiology through the combination of multiple risk factors and similar basic mechanisms of initiation, progression and maintenance so that scientific progress in one disease will enhance understanding of others. In that context, priority will be given to multidisciplinary research into shared mechanisms underlying multifactorial diseases. Priorities are:

### **7.1. Elucidation of the common underlying pathogenic mechanisms involved in disease initiation, progression and maintenance**

Not open in 2001 for RTD projects, demonstration projects, combined RTD/demonstration projects, concerted actions, and thematic networks, except when the proposals stem from exploratory awards.

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<sup>1</sup> Excluding neurological and mental disorders which will be covered within area 9

**7.2. Evaluation of conventional and non-conventional therapies and diagnostic methods through multinational, large scale studies/trials** taking into account advances in modern technology with a focus on four topics: (i) development and evaluation of invasive and preferably non-invasive methods of imaging, both anatomical and functional (particularly for early diagnosis, clinical evaluation and monitoring of pathological processes) and of existing and new non-invasive monitoring devices; (ii) research into molecular and clinical markers of chronic, degenerative and rare disorders for diagnosis, prognosis and progression and for use in early diagnostic tests and screening methods for the identification of high-risk populations; (iii) clinical trials<sup>1</sup>: treatment and prevention, assessment of the safety and efficacy of new and existing drugs or other therapies (comparison of different therapies and interventions), and establishment of harmonised guidelines and protocols for the best use of interventions; (iv) retrospective and prospective studies and trials to assess the impact of specific therapies and prevention on risk in the general population and groups at risk.

**7.3. Optimised use of databases, registries, reagents and sample banks:** concerted actions, thematic networks and RTD projects to improve the use of relevant registries, databases and sample banks, for data on risk factors, outcome and impact of specific treatments and interventions<sup>2</sup>.

This line will also support , cooperative research, exploratory awards, training fellowships and accompanying measures. In addition, all types of actions are open if the proposals stem from exploratory awards under this programme.

## ***8. Research into Genomes and diseases of genetic origin***

### ***OBJECTIVES***

*The main objective of this activity is to reinforce the knowledge base for identifying the biological functions of genes and the genetic basis of disease. Research will cover functional, computational and comparative genomics and proteomics.*

### **8.1. Genome analysis**

Not open in 2001 for RTD projects, demonstration projects, combined RTD/demonstration projects, concerted actions, and thematic networks, except when the proposals stem from exploratory awards under this programme.

### **8.2. Functional genomics and proteomics**

Not open in 2001 for RTD projects, demonstration projects, combined RTD/demonstration projects, concerted actions, and thematic networks, except when the proposals stem from exploratory awards under this programme.

**8.3. Development of novel expression systems, model organisms, mutant, transgenic and hybrid organisms.** Priorities are: (i) facilitation of the study of human and other genes of biomedical, agronomic and industrial interest in appropriate organisms; (ii) systematic approaches to establish meaningful models for the analysis of single gene functions; (iii) mutation detection and polymorphic variation analyses, including the development of improved detection technologies to fully exploit this resource for human health.

Note that, for the year 2001, line 8.3 will support only concerted actions, thematic networks, cooperative research, exploratory awards, training fellowships and accompanying measures, with the exception of research into genomes of microbial organisms, plants and farm animals where RTD projects will also be

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<sup>1</sup> Only phase III and phase IV trials as RTD projects

<sup>2</sup> See also Area 14 (Support for Research Infrastructures)

supported. All types of actions are open if the proposals stem from exploratory awards. RTD projects dealing with genomics and human health will be supported in area 8.5.

**8.4. Development and application of underpinning biochemistry, biophysical, statistical and computational approaches.** Priorities are: (i) underpinning biochemical, biophysical, statistical and computational approaches in order to translate the findings of genotypic function / structure / motives into phenotypic description of biomedical issues; (ii) development of new efficient storage and retrieval systems for large data sets with specific software needs, and state of the art database management systems.

Note that, for the year 2001, line 8.4 will support only concerted actions, thematic networks, cooperative research, exploratory awards, training fellowships and accompanying measures. All types of actions are open if the proposals stem from exploratory awards.

## **8.5 Integrated projects in “genomics and human health”**

*To unlock the enormous medical, social and economic potential of the human genome sequence, the links between genomic structure, gene function, gene polymorphism and human disease need to be determined. This will be long-term resource-intensive process, in which Europe needs to combine its efforts and achieve critical mass in order to remain competitive.*

*To assist in this strategic goal, the Programme will support the genomics and human health field through a new type of project, the ‘integrated project’. Each integrated project will cluster within it a number of RTD projects, coordination projects (concerted actions, and/or thematic networks) and host training fellowships, under a common integrated management structure. The RTD projects should perform groundbreaking research. The coordination projects are intended to act as a federating force within the field, creating synergy with and between national programmes. The host fellowships should provide opportunities for training young researchers at Europe’s top centres in the field, both in academia and in industry. Each integrated project should encompass all three of these elements.*

*To ensure a critical mass, an integrated project should contain a minimum of 150 researcher-years of effort (including the training component). Each integrated project will be monitored closely by the Commission and will be subject to an exhaustive mid-term review by independent external experts.*

*Integrated projects will be selected by a two-stage process, involving expressions of interest followed by a dedicated call, in order to allow both the Programme and the applicants to focus on the topics of highest added value for Europe. Expressions of interest will be requested for topics throughout the field of functional genomics relating to human health, including computational genomics, comparative genomics and proteomics. Topics should exploit multi-disciplinary approaches and advance the development and application of new methods and technologies. The deadline for expressions of interest is 9 February 2001. The dedicated call will subsequently be published at least three months before the 18 October 2001 deadline foreseen for proposals. Up to three integrated projects will be selected following the dedicated call.*

## **9. Neurosciences**

### **OBJECTIVES**

The main objectives of this activity are: (i) to provide a better understanding of the nervous system in animals and humans, the mechanisms governing biological and psychological processes and their interrelationship; (ii) to promote new diagnostic, preventive and therapeutic approaches to neurological and mental disorders and enhance transfer of knowledge on neuro- and psychopharmacology to pharmaceutical industry; (iii) to provide new education and learning tools; and (iv) to explore synergies between neuroscience and information technologies. A key feature of this action line will be the integration of theoretical and experimental approaches, of basic and clinical research, of diverse disciplines and levels of organisation (i.e. genetic and molecular, cellular, physiological and psychological systems, the individual, populations) while recognising that no one proposal need contain all of these. Considering the unique skills encompassed by the Human Frontier Science Programme, a contribution will be made available for the whole duration of the 5<sup>th</sup> Framework Programme. Priorities are:

## **9.1 Cell Communication**

Not open in 2001 for RTD projects, demonstration projects, combined RTD/demonstration projects, concerted actions, and thematic networks, except when the proposals stem from exploratory awards.

## **9.2 Brain theories, computational neuroscience and neuroinformatics**

Not open in 2001 for RTD projects, demonstration projects, combined RTD/demonstration projects, concerted actions, and thematic networks, except when the proposals stem from exploratory awards.

**9.3. Brain development, disorders and repair and their clinical, epidemiological and social implications**, concentrating on: (i) understanding the genetic, cellular and molecular basis of development, dysfunction, damage and repair of the nervous system, with special emphasis on the role of stem cells in development and repair; (ii) integration of basic and clinical research with the aim to develop new preventive, protective, diagnostic and therapeutic approaches for neurological and psychiatric disorders<sup>1</sup> (e.g. schizophrenia, autism, eating disorders, multiple sclerosis, basal ganglia diseases etc.) including functional recovery and rehabilitation.

**9.4. Behaviour, cognition and functional mapping of the brain** with a focus on five topics: (i) understanding higher brain functions and sensory and motor activities in health and diseases; (ii) fostering links between experimental analysis of brain processes and non-invasive imaging techniques, in order to understand essential brain functions from perception and motor control to thinking and language conception and production; (iii) evaluation of the benefits and feasibility of transferring novel concepts on the neuronal basis of human behaviour and language learning into childhood education and clinical medicine; (iv) development and validation of imaging technologies, especially non-invasive with improved quantitation, time and spatial resolution as well as the design of common platforms and available tools for treatment, analysis and dissemination of “imaging” data; (v) exploring the potential of functional brain imaging as a diagnostic tool in neurological and mental disorders as well as in rehabilitation.

## ***10. Public health and health services research***

### ***OBJECTIVES***

#### **10.1. Health services research and health and safety at work**

Research will aim to improve the health of European citizens by supporting the Community’s health strategy and its activities in the fields of public health<sup>2</sup>, health services research, and health and safety at work.

Priorities are: (i) to analyse the effectiveness, including cost-effectiveness of health interventions, health promotion and prevention; (ii) to analyse the variations in health care models and inequalities in health status among European countries; (iii) to analyse socio-economic and organisational aspects of health care systems, services, and health policy initiatives<sup>3</sup>; (iv) to evaluate the effectiveness of non-conventional therapies; (v) to develop more sophisticated methods in epidemiology; (vi) to develop and test methodologies for identification of best practice for health interventions, and to acquire evidence for best practice in disease management for health policy decision-making; (vii) to develop and test methodologies for appraising the health impact of policy actions and/or large scale projects, (viii) to identify aetiology of occupational accidents, in particular for specific high risk situations for individuals, enterprise and society; (ix) to determine exposure to and influence of physical and mental stress at work.

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<sup>1</sup> Only phase I and phase II trials as demonstration projects

<sup>2</sup> Cf. The Communication from the Commission on the health strategy of the European Community, and the Proposal for a Decision adopting a programme of Community action in the field of public health – COM(2000)285 final of 16.5.2000 [http://europa.eu.int/eur-lex/en/com/dat/2000/en\\_500PC0285.html](http://europa.eu.int/eur-lex/en/com/dat/2000/en_500PC0285.html)

<sup>3</sup> Proposals related to socio-economic evaluation of health technology should be submitted to Area 13 “socio-economic evaluations of health care and life sciences technologies”.

## **10.2 Fighting drug related problems**

To prevent and control health and social problems for the individual and society related to drugs<sup>1</sup> including doping agents in sport, alcohol and nicotine.

Priorities are: (i) to determine the social, psychological and socio-economic factors related to hazardous use and dependence; (ii) to develop better understanding of the long-term health and social consequences of consumption; (iii) to evaluate current prevention and treatment programmes, to develop more effective treatment strategies; (iv) to undertake epidemiological research for demand reduction such as morbidity/mortality studies, longitudinal development of behaviour and disease, identification of risk groups; (v) to undertake research on the traceable variations of biological profiles in blood or other body fluids (biochemical, hormonal, cell formula etc) induced by doping substances in view of their use as screening targets to detect doping.

## ***11. Research relating to persons with disabilities***

### ***OBJECTIVES***

The aim of this activity is to enhance the quality of life and the independence of persons with physical, mental and intellectual disabilities<sup>2</sup>, taking into account their expectations and the greater contributions they could make to society. Priorities are:

**11.1 Determinants of impairment, disability and handicap** and their inter-relationships, including research into the physiological, psychological, social and educational needs of persons with disabilities. Research should explore new ways of measuring and assessing disability in context, taking into account the effects of physical, policy and social environments, and the dynamic nature of disability over the lifespan and across environments.

**11.2 Methodologies for the assessment of quality of life** from the perspective of persons with disabilities themselves, that is, in terms of personal and social well being, with special emphasis on health and social care and medical treatments.

**11.3 Innovative technological research for the rehabilitation and assistance** of persons with disabilities, taking into account the wide variety of user needs.

**11.4 Health and social care delivery** with a focus on: (i) models for improved effectiveness and efficiency of delivery to persons with disabilities according to the specificities of their impairments; (ii) analysis and comparison of various modalities, such as institutional, community and informal care, and efficacy of distance healthcare; (iii) methodologies for outcome measurement and assessment; predictive models for future needs for health and social care at individual, organisational and societal levels. Special attention will be given to how persons with disabilities age and the implications for health and social care.

Projects where the predominant activity is the development or application of new information, communication and robotic technologies are excluded under this action line and should be submitted to Thematic Programme N° 2 “User-friendly Information Society”, Key Action 1 “Systems and services for the citizen”. Projects focusing more specifically on age-related disabilities are also excluded and should be submitted to Key Action 6 “The ageing population and their disabilities” of this programme.

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<sup>1</sup> Drugs refer to natural or synthetic substances listed in the three UN Conventions from 1961, 1971 and 1988.  
<http://www.incb.org/e/conv/>

<sup>2</sup> Disabilities will be defined according to the ICDH (International Classification of Impairments, Disabilities and Handicaps) of the WHO (World Health Organization), taking into account the current initiative to revise it (ICIDH-2).  
<http://www.who.int/icidh/>

## ***12. Bioethics***

### **OBJECTIVES**

This generic activity responds to ethical concerns arising out of rapid developments in the life sciences in the context of respect for fundamental human values. *The recent publication of the draft sequence of the human genome and the foreseen implications for medicine and human health raise a number of bioethical issues.* Research in bioethics will have the following main objectives: (i) to develop an ethical framework for research and to clarify the responsibilities of researchers, policy makers and economic actors; (ii) to contribute to a balanced dialogue between the public and the actors in the field, and an increased public awareness and consultation on ethical issues taking into account different sociocultural contexts; (iii) to help inform decision makers and citizens with regard to appropriate policy options, and to anticipate and address questions raised by scientific and technological developments, including those arising from this programme; (iv) to create and support pan-European networks of ethical expertise. Priorities are:

**12.1. Ethical aspects of scientific and technological developments,** notably: (i) *the human genome, genetic testing and screening, testing for predisposition, and the human genetic diversity;* (ii) *germline gene modification;* (iii) *the use of human stem cells;* (iv) *in womb therapy;* (v) *xenotransplantation;* (vi) *the use of modern technologies and methods in plant and animal breeding;* (vii) *the use of information technology in medicine.*

**12.2. Ethical framework for life sciences,** notably: (i) *the involvement of human beings in research, in particular children, vulnerable groups and people in developing countries;* (ii) *the use of human cell tissues (including foetal tissues );* (iii) *the use of animals in research, in particular non-human primates;* (iv) *ethical conduct of research and issues linked with the dissemination of results.*

**12.3. Public policies, law, human rights and bioethics,** notably: (i) *bioethics in education systems and professional training;* (ii) *ethical aspects of consumer, environment, animal welfare and agriculture policies, including issues related to the Biodiversity Convention;* (iii) *research on links between bioethics and legislation (Community legislation, international treaties and declarations on bioethics, intellectual property rights, development of patent law and practice in the field of biotechnology and its impact on the protection of human rights, consequences of citizens' ethical concerns for international trade relations);* (iv) *protection of privacy and personal data, including genetic data.*

**12.4. Bioethics infrastructures and methodologies,** notably: (i) *comparative analysis of competencies and methodologies used by national, local and international ethics committees;* (ii) *networking of information infrastructures on legal and ethical data and associated methodologies;* (iii) *concepts of European and universal ethical standards and their relation with national and regional ethical values;* (iv) *bioethics and multiculturalism;* (v) *bioethics and the media.*

## ***13. Socio-economic evaluation of life sciences and health care technologies***

### **OBJECTIVES**

This generic activity aims to encourage (i) *the socio-economic evaluation of life sciences and technologies within the perspective of sustainable development,* and (ii) *the socio-economic evaluation of health care technologies.* This activity aims to provide useful information to policy makers both in the Member States and at Community level, and also to promote public debate. Priorities are:

**13.1 Development of indicators and knowledge bases relevant to public policy making, covering: (I)**

analysis of RTD strategies in the public and private sector; (ii) technology forecasting to highlight potential applications and their likely impact on existing and emerging sectors; (iii) social and cultural perceptions and the shaping of new technologies.

**13.2 Managing technology in society:** (i) *social and economic impact of the availability of genetic information on employment, public and private insurance, and people carrying specific genetic traits*; (ii) cost-effectiveness analyses of health technology (including preventive services) from a societal viewpoint; (iii) research on the implications of new technologies for policies (including monitoring and control) in the field of pharmaceuticals and health care, agriculture, agro-food industry and environment.

**13.3 Analysis of social and economic driving forces and of new opportunities in the bioindustries, including:** (i) studies on the existing and potential impacts of life sciences and technologies on industrial and economic growth, competitiveness and job creation; (ii) analyses of the innovation systems in Europe, including research on how geographic concentration of innovation creators and users helps generate dynamic bioindustries; (iii) research on intellectual property rights and the importance of intellectual property protection; (iv) research on the availability of investment capital and human resources; (v) research on the effect of regulations on the development of Europe's bioindustries.

### ***14. Support for research infrastructures***

Within the Quality of Life and Management of Living Resources Programme, the term “research infrastructures” refers to facilities and resources that provide essential services to the research community in the life sciences. The objectives of the Programme in supporting research infrastructures (in this action line as well as elsewhere in the Programme where research infrastructures are supported) are: (i) to encourage the optimum use of Europe’s research infrastructures, notably by fostering transnational co-operation in their rational and cost-effective use and development and, in conjunction with the Quality of Life and Management of Living Resources system of Marie Curie Fellowships, by broadening access to these infrastructures particularly for young researchers; (ii) to improve the European-wide consistency and complementarity of these infrastructures and their competitiveness at world level; and (iii) to help improve the quality and user-orientation of services offered to the European research community. The role of the Programme’s activities in support for research infrastructures is to add value at the European level in the context that the construction and operation of research infrastructures is the responsibility of national authorities. This particular action of the Quality of Life and Management of Living Resources Programme will provide support for research infrastructures in the following fields:

**14.1. Biological collections** notably: (i) *repositories of living and non-living specimens, including mutants and strains (e.g. mouse) and other genetic models*; (ii) *genetic materials (vectors, genes, DNA, chromosomes)*; (i) microbial collections; (iv) reference collections for age determination or validation of aquatic organisms.

**14.2. Biological information resources**<sup>1</sup> notably: (i) *development of large genomic and proteomic databases, including functional imaging, and validation and management tools*, biodiversity and taxonomic databases, particularly in the context of international actions; (ii) platforms providing linkages through the biological information chain, from factual data to print media; (iii) fisheries databases: catches, discards, selectivity, tagging, etc; (iv) databases on forest genetic resources, tree improvement programmes and forest ecosystem dynamics.

**14.3. Clinical research facilities** notably: (i) facilities for the development and validation of drugs, vaccines, methods and devices for improved diagnosis, monitoring and therapy, particularly for diseases of major concern in Europe; (ii) high-level clinical and pre-clinical containment facilities; (iii) advanced medical technology facilities and infrastructures for standardised multi-centre clinical trials; (iv) registries and pooled databases of clinical trials; (v) European facilities for batch production for clinical trials.

**14.4. Pre-clinical research facilities** notably: facilities for development of in-vitro systems or cell cultures and, where no other means exist, breeding of animals, including non-human primates, to provide models of human diseases and facilitate development of vaccines, new drugs and medical devices.

**14.5. Facilities for aquaculture and fishery research** notably: (i) fishery research vessels for biological surveys; (ii) flume tanks for experiments to improve fishing gear selectivity; (iii) aquaculture laboratories and basins for genetic experiments and pathological trials; (iv) facilities for standardisation of diagnoses and validation of markers for fisheries management purposes.

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<sup>1</sup> The Environment and Sustainable Development Programme may also consider proposals on research infrastructures concerning relevant information resources.

**14.6 Exploiting High-Bandwidth Communication Networks (multigigabit/s).** This line will focus on application-driven multidisciplinary research that aims to develop the specific applications, standards and protocols needed for the bioscience community to exploit fully the potential of future Europe-wide high-bandwidth communication networks and ‘Grids’<sup>1</sup> addressing at the same time high-throughput computing and high-capacity networking. Proposals are requested, for example, in the following fields: bioinformatics, genomics, proteomics, pharmacogenomics, clinical and surgical medicine. Proposals that involve the networking of Europe’s major information resources or those aimed at creating ‘virtual’ or ‘distributed’ information resources are particularly encouraged. Suitable exploitation plans and, where appropriate, the participation of industry are essential.

Furthermore, classes of research infrastructures eligible for support within the RTD activities of a generic nature will also be considered eligible under this action whenever there is no relevant call for proposals open under those activities.

**It should be noted that the “Quality of Life and Management of Living Resources” programme will not provide support for tasks that involve the construction and routine operation of research infrastructures, nor for the collection of data (unless the collection is an integral component of the research in an infrastructure RTD project). The cost of activities aimed at stimulating the introduction and use of trans-European broadband communication networks for research will however be considered eligible.**

An indicative budget of €42 million will be available for the two cut-off dates foreseen in 2001: €33 million for the deadline on 9 February 2001 and €9 million for 18 October 2001. Within the indicative budget of €33 million available for the deadline in February 2001, *€25 million will be earmarked to provide support for research infrastructures in the field of genomics and human health, in particular for genomic and proteomic databases and for repositories of suitable animal models (subject to the receipt of sufficient proposals of adequate quality and relevance).*

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<sup>1</sup> The concept of the ‘Grid’ conceptualises a new schema for data-intensive computing and networking. Such infrastructure is meant to connect multiple computational grids, creating a universal source of pervasive and dependable computing power that supports new classes of applications.

## ANNEXES

**Annex I: Strategic initiatives through accompanying measures**

**Annex II Selection criteria**

**Annex III : Roadmap**

**Annex IV. Coordination**

## ***Annex I : Strategic Initiatives through accompanying measures***

Proposals are also invited for initiatives, which are not research proposals per se, but which contribute to the implementation of the Quality of Life and Management of Living Resources Programme and to achieving its strategic objectives as described in this Work Programme. The modality available for such initiatives is that of accompanying measures.

Accompanying measures are important tools for raising awareness of scientific, technological, social and political consequences of new knowledge as well as for identifying future research needs. They must be activities of strategic significance, offering clear evidence of European added value and with a clearly identified target audience for the results. They must include appropriate and realistic dissemination plans and should not be an end in themselves, but should have an impact which is felt after the activity itself is complete. They should take account of relevant gender issues and where appropriate, they should take into account the objectives described in the Commission Communication on the European Research Area (<http://europa.eu.int/comm/research/area.html>).

In addition measures of relevance to specific Key Actions and Generic Activities, strategic initiatives are sought in the following areas:

- studies in support of the programme, including the preparation of future Community activities in the life sciences or support for strategic policy-making; meta-analyses of research results on areas of particular policy interest, examination of the implications of intellectual property regulations for innovation in the life sciences,
- design of new consensus-forming initiatives for life-science applications, taking into account all stakeholders; investigating the formation of public attitudes to advances in the life sciences, and the process by which public attitudes and expectations are translated into law, ethical principles or consultation procedures,
- initiatives to popularise life-sciences in the media (including the internet) and in education, to increase the public understanding of science; initiatives to allow sharing of best practice in fostering dialogue on the life sciences with the public, and in communicating science based issues to policy makers,
- transfer of technologies and RTD results to potential users; encouragement of innovation financing and assistance with the protection of intellectual property created in the programme; measurement of the impact of the research activities funded by the Community in the Life Sciences and, where necessary, development of methodologies to measure this impact,
- targeted training schemes, such as summer schools, in areas of particular relevance to the programme, where there is a need at European level ,
- exchange of information through: seminars, workshops and scientific and technical meetings as well as other appropriate mechanisms, designed for creating synergy and enhancing co-ordination between programme activities as well as between national activities in Member States, Associated States and where appropriate, other countries (in particular in the context of S&T co-operation agreements).

Nota bene:

Proposals for accompanying measures have to plan a starting date for the intended activity at least six months after the cut-off date (see roadmap) set for the batch of proposals for which they are submitted.

In specific cases, accompanying measures may also be the subject of spontaneous applications for a subsidy.

## Annex II: Selection criteria

RTD actions have to be selected according to criteria reflecting the overall objectives of the programme. These criteria, to be respected by all research activities within this programme, have been designed applying the selection criteria set for the Fifth Framework Programme<sup>1</sup>. The criteria are grouped in five categories :

<b>Economic development and S&amp;T prospects</b>	<i>The contribution to European technological progress and the <b>dissemination strategies</b> for the expected results</i>
	<i>Where relevant to the action, the <b>strategic impact</b> of the proposed project and its potential to improve competitiveness</i>
	<i>The possible contribution to growth, in particular the <b>usefulness and range of applications</b> and quality of the <b>exploitation plans</b></i>
<b>Contribution to Community social objectives</b>	<i>Where relevant to the action, the contribution to <b>preserving and/or enhancing the environment</b>; environment impact assessment where relevant</i>
	<i>Where relevant to the action, the contribution to improving <b>employment</b> prospects and the use and development of skills</i>
	<i>The contribution to improving the <b>quality of life and health and safety</b>; ethical issues and safeguards</i>
<b>Community added value and contribution to EU policies</b>	<i>The contribution to the implementation or the evolution of one or more <b>EU policies</b> or addressing problems connected with standardisation and regulation</i>
	<i>The <b>European added value of the consortium</b></i>
	<i>The <b>European dimension of the problem</b></i>
<b>Resources, Partnership and Management</b>	<i>The <b>appropriateness of the resources</b></i>
	<i>The <b>quality of the partnership</b> and involvement of users and/or other actors in the field when appropriate</i>
	<i>The <b>quality of the management and project approach</b> proposed</i>
<b>Scientific / Technological quality and innovation</b>	<i>The <b>adequacy</b> of the chosen approach, methodology and work plan</i>
	<i>The originality, <b>degree of innovation</b> and progress beyond the state of the art</i>
	<i>The <b>quality</b> of the research proposed</i>

According to the needs and the types of action, different emphasis might however be given to these different categories of selection criteria or to different criteria within a category. Details will be specified in the evaluation manual.

<sup>1</sup> Decision 182/1999/EC of the European Parliament and of the Council of 22 December 1998. OJ L 26, 1.2.1999, p. 1.

These criteria should also be respected during the execution of the research activities in order to achieve overall excellence and consistency. They will be used to assess activities and help quantify impacts, providing information that will enable a timely and appropriate programme management response. The evaluation of the potential impact of new knowledge, technologies, products, processes or materials resulting from RTD actions will be a permanent activity of this programme, ensuring in this way an effective implementation of the Council decision.

The above selection criteria will be applied, where appropriate, in the light of ethical and other considerations with a significant bearing on the impact for society of the life sciences. The evaluation manual for this programme clearly develops several of these considerations. However, in order to shed further light on the ways in which selection criteria impinge on European competitiveness and quality of life, particular emphasis must be placed on the desirability of ensuring a high level of ethical awareness at the proposal submission stage.

Proposals must respect fundamental ethical principles including human rights and animal welfare requirements, pursuant to footnote on ethics in Annex II, part II of the decision 182/1999/EC of 22 December 1998 of the European Parliament and the Council adopting the 5<sup>th</sup> Framework Programme<sup>1</sup>. They should provide the minimum amount of information for reviewers to form their independent opinion on the level of awareness, and the existence of adequate provisions where necessary, as shown by project participants. In particular, research should comply with all relevant national and international laws, conventions and codes of conduct and, where appropriate, have the explicit approval of local or national research ethics or animal welfare committees.

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<sup>1</sup> OJ L 26, 1.2.1999, p.1

### ***Annex III: Roadmap***

- The following pages present in a tabular form the calendar of calls for proposals with indication of: the areas in the Work Programme concerned, dates of the publication, deadlines for submission and an indicative budget breakdown.
- The following provision are of general application:
  - « The Director general of the DG for Research is allowed to modify the launching date of the calls for proposals by more or less one month. In that case, a notice will be published in the Official journal of the European Communities at the date initially scheduled for the call for proposals and the deadlines for submitting proposals will be changed accordingly. The notice will inform the potential applicants of such postponement. »
  - « The Commission reserves the right not to commit all the budget available for each call ».

## **II - QUALITY OF LIFE AND MANAGEMENT OF LIVING RESOURCES ROADMAP 2001**

Type of activity		Indicative budget available per activity per deadline in millions of euro*			Date of publication in the O.J : 15 November 2000			Type of action open  (RTD: research and technological Development projects DP: demonstration projects CD: combinedRTD/demonstration projects TM: thematic networks CA: concerted actions)  All types of actions are open if the proposals stem from exploratory awards.	
					Call for proposals QoL-2001-3				
Key action					Deadlines for submitting proposals				
Title	Area	28 Feb.	15 Mar.	18 Oct.	28 Feb.	15 Mar.	18 Oct.		
<b>1. Food, nutrition and health</b>	1.3 Research into the role of food in promoting and sustaining health [...]			29			X	RTD. DP. CD. TN. CA	
<b>2. Control of infectious diseases</b>	2.1 Development of improved or novel [...]vaccines	2.1.1 New vaccination strategies						X	RTD. DP. CD. TN. CA
		2.1.2 Discovery phase and pre-clinical development [...]						X	RTD. DP. CD. TN. CA
		2.1.3 Clinical evaluation of vaccines						X	DP for early clinical testing (phases I and II). CA and TN for clinical trial (phases III and IV)
	2.2 Strategies to identify and control infectious diseases	2.2.1. Treatment of, and protection against, human and animal infectious diseases			81			X	RTD. DP. CD. TN. CA and for early clinical testing (phases I and II) only DP
		2.2.2 Antimicrobial drug resistance and changes in virulence						X	RTD. DP. CD. TN. CA
		2.2.3 Diagnostics tests for humans and animals						X	RTD. DP. CD. TN. CA
	2.3 Aspects of public health and care delivery systems						X	RTD. DP. CD. TN. CA	

\* It is envisaged to publish jointly with the programme "Environment and Sustainable Development" a dedicated call regarding "endocrine disruptors". (This may influence the budgetary amounts available for the call QoL-2001-3).

Type of activity			Indicative budget available per activity per deadline in millions of euro*			Date of publication in the O.J : 15 November 2000			Type of action open (RTD: research and technological Development projects DP: demonstration projects CD: combined RTD/demonstration projects TM: thematic networks CA: concerted actions)  All types of actions are open if the proposals stem from exploratory awards.	
Key action						Call for proposals QoL-2001-3				Deadlines for submitting proposals
Title	Area		28 Feb.	15 Mar.	18 Oct.	28 Feb.	15 Mar.	18 Oct.		
<b>3. The "Cell Factory"</b>	3.1 Improving the diagnostic and therapeutic arsenal for health care	3.1.1 Development of new diagnostics						X	DP	
		3.1.2. Therapeutic substances					X		RTD. DP. CD. TN. CA. For clinical trials (phases I and II) only DP. For clinical trials networks (phases III and IV) only CA and TN	
		3.1.3. Therapeutic strategies						X		
		3.1.4. Novel <i>in-vitro</i> testing [...]						X		RTD. DP. CD. TN. CA
	3.2. Improving environmental sustainability	3.2.1 New bioprocesses for industrial efficiency, to avoid pollution [...]						X		DP
		3.2.2 Bioassays and biosensors							X	RTD. DP. CD. TN. CA
		3.2.3 Biodegradation of recalcitrant chemicals and bioremediation						X		RTD. DP. CD. TN. CA
		3.2.4 Biodiversity [ ]							X	RTD. DP. CD. TN. CA
		3.2.5 [...] safe use of new biomolecules and bioprocesses, for identifying recombinant organisms [...]							X	RTD. DP. CD. TN. CA
	3.3. New bio(techno)logical processes/products [...]	3.3.1 Exploiting the cellular [...] for new nano- and microtechnologies						X	X	RTD. DP. CD. TN. CA
		3.3.2. High value-added products [...]							X	DP
		3.3.3. Functional biomolecules and biocatalysts.						X		RTD. DP. CD. TN. CA
		3.3.4. [...] metabolic and genetic diversity [...]							X	RTD. DP. CD. TN. CA
			41	97						

\* It is envisaged to publish jointly with the programme "Environment and Sustainable Development" a dedicated call regarding "endocrine disruptors". (This may influence the budgetary amounts available for the call QoL-2001-3).

Type of activity		Indicative budget available per activity per deadline in millions of euro*			Date of publication in the O.J : 15 November 2000 Call for proposals QoL-2001-3			Type of action open
Key action					Deadlines for submitting proposals			(RTD: research and technological Development projects DP: demonstration projects CD: combined RTD/demonstration projects TM: thematic networks CA: concerted actions) All types of actions are open if the proposals stem from exploratory awards.
Title	Area	28 Feb.	15 Mar.	18 Oct.	28 Feb.	15 Mar.	18 Oct.	
<b>4. Environment and Health</b>	All areas		29			X		RTD. DP. CD. TN. CA. Only TN and CA for carcinogenic effects linked to EMF (RF) radiation and cellular phones.
<b>5. Sustainable agriculture, fisheries and forestry [...]</b>	All areas			121			X	RTD. DP. CD. TN. CA
<b>6. The ageing population</b>	6.1. Age-related illnesses and health problems					X		TN. CA. In addition, for visual and auditory impairment, comorbidity, depression and incontinence RTD and DP with the exception for clinical trials (phases I and II) for which DP, CA and TN may be supported and for clinical trials (phases III and IV) for which CA and TN may be supported.
	6.2. Determinants of healthy ageing [...]		42			X		RTD. CA. TN with the exception for clinical trials (phases I and II) for which DP, CA and TN may be supported and for clinical trials (phases III and IV) for which CA and TN may be supported.
	6.3. Demographic and social policy aspects of population ageing					X		RTD. CA. TN
	6.4. Coping with functional limitations in old age					X		RTD. CA. TN. DP. with the exception for clinical trials (phases I and II) for which DP, CA and TN may be supported and for clinical trials (phases III and IV) for which CA and TN may be supported.
	6.5. Health and social care services to older people						X	RTD. DP. CA. TN

\* It is envisaged to publish jointly with the programme "Environment and Sustainable Development" a dedicated call regarding "endocrine disruptors". (This may influence the budgetary amounts available for the call QoL-2001-3).

Type of activity		Indicative budget available per activity per deadline in millions of euro*			Date of publication in the O.J : 15 November 2000			Type of action open  (RTD: research and technological Development projects DP: demonstration projects CD: combinedRTD/demonstration projects TM: thematic networks CA: concerted actions)  All types of actions are open if the proposals stem from exploratory awards.
					Call for proposals QoL-2001-3			
Research and technological development activities of generic nature					Deadlines for submitting proposals			
Title	Area	28 Feb.	15 Mar.	18 Oct.	28 Feb.	15 Mar.	18 Oct.	
<b>7. Chronic and degenerative diseases [...]</b>	7.2. [...] therapies and diagnostic methods [...]						X	RTD. DP. CD. TN. CA.Except for clinical trials (phases III and IV) only RTD
	7.3. Optimised use of databases, registries, reagents and sample banks						X	RTD. TN. CA
<b>8. Research into genomes and diseases of genetic origin</b>	8.3. [...] novel expression systems, model organisms, mutant, transgenic and hybrid organisms.						X	CA.TN and for research into genomes of microbiol organisms, plants and farm animals also RTD
	8.4. [...] underpinning biochemistry, biophysical, statistical and computational approaches						X	CA. TN
<b>9. Neurosciences</b>	9.3. Brain development, disorders and repair [...]						X	RTD. DP. CD. TN. CA.Except for clinical trials (phases I and II) only DP
	9.4. Behaviour, cognition and functional mapping of the brain			126**			X	RTD. DP. CD. TN. CA
<b>10. Public health and health services research</b>	All areas						X	RTD. DP. CD. TN. CA
<b>11. Research relating to persons with disabilities</b>	All areas						X	RTD. DP. CD. TN. CA
<b>12. Bioethics</b>	All areas	7			X		X	RTD. DP. CD. TN. CA

\* It is envisaged to publish jointly with the programme "Environment and Sustainable Development" a dedicated call regarding "endocrine disruptors". (This may influence the budgetary amounts available for the call QoL-2001-3).

\*\* Part of this amount will also be used for the dedicated call QoL-2001-DC8 on area 8.5 with deadline on 18 October 2001.

Type of activity		Date of publication in the O.J : 15 November 2000			Type of action open	
Type of activity		Call for proposals QoL-2001-3			(RTD: research and technological Development projects DP: demonstration projects CD: combined RTD/demonstration projects CA: concerted actions)	
<b>13. Socio-economic evaluation of life sciences and health care technologies</b>	All areas			X		X
All types of actions are open if the proposals stem from exploratory awards.						

***CALL FOR EXPRESSIONS OF INTEREST  
AND DEDICATED CALL FOR PROPOSALS  
IN THE FIELD OF "GENOMICS AND HUMAN HEALTH"  
(YEAR 2001)***

<b>RESEARCH AND TECHNOLOGICAL DEVELOPMENT ACTIVITIES OF A GENERIC NATURE</b>	<b>Date of publication in the O.J : 15 November 2000</b>  <b>Call for expressions of interest QoL-2001-CEI8</b>	<b>Indicative date of publication in the O.J : 29 June 2001<sup>1</sup></b>  <b>Dedicated call for proposals<sup>2</sup> QoL-2001-DC8</b>
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AREA	FIELD
<b>8.5. Genomics and human health</b>	Functional genomics, relating to human health, including computational genomics, comparative genomics and proteomics

**Deadline for submitting  
expressions of interest:  
9 February 2001**

**Deadline for submitting  
proposals:  
18 October 2001**

<sup>1</sup> This call could be published earlier.

<sup>2</sup> The exact content of this call will be defined by the European Commission following the evaluation of the expressions of interest received in the framework of the call QoL-2001-CEI8.

# **ACTIVITIES INVITED THROUGH THE OPEN CALL FOR PROPOSALS 1999/C 64/13**

## **(JO C 64, 6.3.1999, p. 16)**

TYPE OF ACTION	Indicative budget available for proposals to be evaluated according to the cut-off dates in 2001 in millions of euro	Indicative budget available for proposals to be evaluated according to the cut-off dates in 2002 in millions of euro	Proposals will be evaluated by batches according to the following cut-off dates
<b>TRAINING FELLOWSHIPS<sup>(1)</sup></b>			
<b>TITLES</b>	<b>AREAS</b>		
<b>Individual Fellowships</b>	Marie Curie Individual Fellowships		11/04/2001, 10/10/2001, 10/04/2002
	Return Fellowships		
	Experienced Researcher's Fellowships		
<b>Marie Curie Host Fellowships</b>	Training sites		01/02/2001
	Industry host fellowships		
<b>TECHNOLOGY STIMULATION TO ENCOURAGE AND FACILITATE SME PARTICIPATION IN RTD ACTIVITIES<sup>(1)</sup></b>			
SME Exploratory Awards	39	20	17/01/2001, 18/04/2001
Cooperative research	32	22	17/01/2001, 18/04/2001, 19/09/2001, 16/01/2002, 17/04/2002
<b>ACCOMPANYING MEASURES<sup>(1) (2)</sup></b>			
See Annex 1	11	10	09/02/2001, 12/06/2001, 11/10/2001, 08/02/2002, 12/06/2002
<b>TYPE OF ACTIVITY<sup>(3)</sup></b>			
<b>SUPPORT FOR RESEARCH INFRASTRUCTURES</b>			
<b>TITLES</b>	<b>AREAS</b>		
Research Infrastructures	43	9	09/02/2001, 18/10/2001, 08/02/2002

(1) All key actions, research and technological development activities of generic nature and support activities for research infrastructures are covered.

(2) Proposals for accompanying measures have to plan a starting date for the intended activity at least six months after the cut-off date set for the batch of proposals to which they are submitted.

(3) Only proposals for research and technological development projects, demonstration projects, combined RTD/demonstration projects, thematic networks and concerted actions can be submitted.

# ***INDICATIVE ROADMAP FOR 2002***

<b>TYPE OF ACTIVITY</b>		<b>Indicative budget available per activity in millions of euro</b>	<b>Deadline for submitting proposals: March 2002</b>
<b>KEY ACTIONS</b>			
<b>TITLES</b>	<b>AREAS</b>		
<b>1. Food, nutrition and health</b>	All areas	59	x
<b>4. Environment and Health</b>	All areas	44	x
<b>5. Sustainable agriculture, fisheries and forestry and integrated development of rural areas, including mountain areas</b>	All areas	31	Targeted research aspects only across all areas in KA5
<b>6. The ageing population</b>	All areas	50	x
<b>RESEARCH AND TECHNOLOGICAL DEVELOPMENT ACTIVITIES OF A GENERIC NATURE</b>		7 <sup>1</sup>	x
<b>Indicative budget in millions of euro : (dependent on budget approval by the budgetary authority)</b>		191	

<sup>1</sup> Exclusively for areas 12 and 13

## ***Annex IV: Coordination***

In conformity with the new strategy of problem-driven research, materialised in particular through the key actions, it is a deliberate move that E.U. research aligned with the objectives of any key action should benefit to any possible extent from the contributions of third country participants and international organisations where appropriate, from the whole fabric of innovative SMEs as value-providers, and from a high turn-over of competent and versatile human resources. A full integration will be sought through the same projects, with common mechanisms of coordination, and the possible support of accompanying measures as facilitating options. The calls for proposals will also specify the need for socio-economic research and technology impact assessment, as an integral part of all key actions.

### **1. Confirming the international role of Community research**

This programme will be open to participation by researchers from outside the EU and Associated States according to the rules of participation set out in the Council decision 1999/65/EC of 22 December 1998<sup>1</sup> pursuant to article 167 of the treaty, thus complementing the activities of the horizontal programme 'Confirming the International Role of Community Research'. Global international cooperation will be encouraged for RTD activities which deserve being tackled in a broader transboundary context, and in the first place where cooperation agreements exist or where synergies with other international programmes and activities can be exploited for the benefit of Europe. Particular attention would go into opportunities for cost-effective coordination and cooperation with initiatives such as COST or EUREKA, where complementary activities are taking place.

Considering the role of management supporting party of the Commission in the Human Frontier Science Programme, cross participation and coordination with this programme on specific action lines in the present work programme will be stimulated through a contribution during the whole duration of the 5<sup>th</sup> Framework Programme. This contribution will be made available through yearly subsidies.

The programme 'Confirming the International Role of Community Research' provides funding for bursaries to young scientists from Developing Countries (including Emerging Economies and Mediterranean partner Countries) to come to Europe to work in projects of this programme for a period of up to 6 months.

### **2. Innovation and participation of SME**

#### ***Innovation***

One of the general objectives of the horizontal programme 'Promotion of innovation and encouragement of SMEs participation' is to improve the economic and social impact of framework programme research activities by ensuring better dissemination of technology from various sources, taking account of the needs of customers and users.

In order to achieve this objective the horizontal programme, inter alia, will coordinate and support the efforts of the thematic programmes which themselves, under the impulse of their innovation cells, will carry out the bulk of the work related to the promotion of innovation. As such, account will be taken of the specific features of the research topics and the best possible match between the exploitation of research and their application context will be ensured. In this context the programme 'Quality of life and management of living resources' will devote particular attention to the aspects dealing with the exploitation of results and innovation during the evaluation of proposals and during the negotiation of contracts (part of the technical annex dealing with dissemination and exploitation of results, implementation and follow up of the Technology Implementation Plan). The programme "Quality of Life and Management of Living Resources" will promote, where applicable, private financing of the exploitation of RTD results, optimisation of technology transfer, including outside the consortium (i.e. industrial platforms, extended audiences), and promote an innovation and entrepreneur culture (i.e. sensibilization, case-studies, training).

#### ***SME Specific Measures***

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<sup>1</sup> OJ L 26, 1.2.1999, p. 46

The programme will implement special measures to facilitate and encourage the participation of SMEs in RTD, demonstration and combined RTD/demonstration projects that show great potential as regards innovation. These measures consist of Cooperative Research (CRAFT) and Exploratory Awards

An Exploratory Award is intended to prepare a complete project proposal: either a CRAFT project proposal that is submitted in response to the permanent open call, or an RTD, demonstration, combined RTD/demonstration projects submitted in response to a periodic call.

The measures aimed at encouraging and facilitating SME participation in RTD activities relate to projects that show great potential as regards innovation. Cooperative Research proposals and Exploratory Awards proposals aimed at Cooperative Research may fall within the overall objectives of the thematic programmes. In other words, they do not have to relate to the specific objectives and priorities of the key actions, RTD activities of generic nature and research infrastructure. As such, these measures allow for a “bottom up” character since proposals may be submitted for the objectives and priorities of the thematic programmes in their entirety.

Exploratory Award proposals intended to prepare non-CRAFT projects must address priorities identified in the work programme regarding the periodic call envisaged for the submission of the resulting project proposals. In addition, they must be submitted sufficiently in advance of the closing date of the envisaged periodic call (i.e. at least 9 months between the chosen cut-off date for the submission of the Exploratory Award proposal and the closing date of the periodic call). Non-CRAFT project proposals prepared through Exploratory Awards must conform to the priorities of the periodic call in response to which they are submitted (even if these priorities have changed compared to those on the base of which the Exploratory Award proposals were selected).

The implementation of the SME specific measures follows the common rules established in the horizontal programme “Innovation and the participation of SMEs”, in order to ensure transparency for the beneficiaries. These rules include common contractual and proposal evaluation, a single complementary entry point for the reception of proposals for SME specific measures, common rules for eligibility and for scientific and technological evaluation; common legal and financial provisions as well as a harmonised and rapid feedback to applicants.

- “Cooperative Research” proposals (CRAFT) enable at least three mutually independent SMEs from at least two different Member States or one Member State and an Associated State to jointly seek the resolution of their common technological problems by entrusting it to third legal entities (the “RTD performers”), including industrial entities, with appropriate research or technological validation capacities. In the context of Cooperative Research projects, it is allowed that those SME contractors which are able to carry out part of the research themselves may do so up to 60% of total project costs, leaving the remainder (40% or more) to be executed by the RTD performer. The total cost of Cooperative Research projects may not exceed 2 millions of euro, of which the Commission may fund up to 50%. Their maximum duration is 24 months. Cooperative Research projects might include a validation phase.
- “Exploratory Awards” allow at least two SMEs from two different Member States or one Member State and an Associated State to obtain financial support from the Commission to prepare a complete project proposal. The total cost of an Exploratory Award may not exceed 30.000 euro, of which the Commission may finance up to 75% (or 22.500 euro). The maximum duration of an Exploratory Award is 12 months.

### **3. Improving human potential**

*Marie Curie Training Fellowships* are defined in the framework of the horizontal programme “Improving the human research potential and the socio-economic knowledge base”. The “Quality of Life and Management of Living Resources” programme will offer the following types of Marie Curie Fellowships: Individual Fellowships; Return Fellowships; Experienced Researchers Fellowships; Industry-Host Fellowships; (PhD stays at) Marie Curie Training Sites.

The implementation of the Marie Curie Fellowships follows the common rules established in the horizontal programme “Improving the human research potential and the socio-economic knowledge base”, in order to ensure the consistent high quality and prestige of the schemes. These rules include a common definition of Marie Curie Fellowships, a Single Entry Point for the reception of all Marie Curie Fellowship proposals, common rules for eligibility and for evaluation, common legal and financial provisions as well as a

harmonised feedback to applicants and monitoring of the fellows.

### ***Research Infrastructures***

Support for research infrastructure is provided by thematic programmes, as well as by the horizontal programme “Improving the human research potential and the socio-economic knowledge base”. This horizontal programme will have the responsibility of drawing up and publishing on a regular basis a “map” showing for all classes of research infrastructure to which specific programme(s) they may apply for support.

### ***Socio-economic Research***

Socio-economic research can be funded by both the thematic programmes, as well as by the key-action on “Improving the Socio-economic Knowledge Base” of the horizontal programme “Improving the human research potential and the socio-economic knowledge base”. Taking into account the philosophy of the Fifth Framework programme, socio-economic research is present in the thematic programmes as an integral part of the technological research activities. Specific measures will be taken by the horizontal programme to ensure co-ordination of the socio-economic research to be implemented within the current programme. The horizontal programme will draw up an annual report on socio-economic research in the Fifth Framework Programme.

## **4. Interactions within the programme and across programmes**

How far can this programme meet citizens expectations will depend on the possibility to maintain, or even multiply the number of interfaces. The whole set-up of the programme is already based on the recognition and upgrading of technology cross-roads. Each key action indeed does already combine biological knowledge and sets of converging technologies. And yet, more such interactions can be anticipated within the programme and across sister programmes, including horizontal activities. This is illustrated through Tables 1 and 2. In addition, the “Genome Research for Human Health” initiative is being addressed through different parts of the Programme as summarised in Table 3.

There is a degree of unpredictability in trying to define the extent of possible interfaces such as in the tables. It should be enough to recall the following principles, when reviewing in-coming proposals:

- It is assumed that proposals, drafted as they should in accordance with the RTD priorities enumerated in the previous part of the workprogramme, should unambiguously fall under the relevant actions and be coordinated, where appropriate, with other projects of the same action.
- In case a proposal is transgressing academic frontiers and includes either remote technology inputs or multiple spin-offs in neighbouring fields, its submission through the “Quality of Life and Management of Living Resources” programme would still be legitimate. It would be sufficient that the core of such proposal be relevant to the RTD priorities seen above.
- As a guideline, a proposal which essentially intends to **develop** a new technology should seek funding from the programme which is the natural host for such technology (e.g. genetics comes under theme 1, computer science under theme 2, instrumentation and process design under theme 3, ecology under theme 4, etc.). Conversely, a proposal which **uses** or **streamlines** a technology developed elsewhere to reinforce performance in research and applications with the quality of life and management of living resources as a **primary objective**, should be addressed to this programme known as theme 1.

The handling of this type of projects would imply that they be examined in the proposal stage simultaneously by the management teams of the two (or more) programmes covering the connected interests, and be further coordinated with a wider range of sister projects across the programmes in the implementation phase. Clustering mechanisms could support this process.

## *Tables relating to Annex IV, Point 4 (Coordination)*

### **PLEASE NOTE:**

Tables 1 and 2 are intended to enable the reader to identify in the main text possible interfaces between the key actions in the thematic programme Quality of Life, and areas of possible relevance in other programmes (accessible via the DG XII website <http://europa.eu.int/comm/dg12>).

Each interface in Table 1 is described in two cells, referring to numbered headings in the work programme text of the key actions which label the rows.

In Table 2, interfaces are referenced only to the texts of the other work programmes (column headings).

Table 3 gives an overview of the way the initiative “Genome Research for Human Health” is being addressed in the different parts of the “Quality of Life and Living resources” programme.

**TABLE 1: INTERFACES BETWEEN THE KEY ACTIONS OF THE SPECIFIC PROGRAMME « QUALITY OF LIFE AND MANAGEMENT OF LIVING RESOURCES »**

	FOOD, NUTRITION AND HEALTH (K.A. N°1)	CONTROL OF INFECTIOUS DISEASES (K.A. N°2)	THE «CELL FACTORY» (K.A. N°3)	ENVIRONMENT AND HEALTH (K.A. N°4)	SUSTAINABLE AGRICULTURE, FISHERIES, AND FORESTRY [...] (K.A. N°5)	THE AGEING POPULATION AND DISABILITIES (K.A. N°6)
FOOD, NUTRITION AND HEALTH (K.A. N°1)		Detection and elimination of infectious and toxic agents throughout the food chain (1.2) inc. TSE, food pathogens	Safe and flexible manufacturing processes and technologies (1.1) inc. novel and improved biological raw materials for food	Detection and elimination of infectious and toxic agents in food chain (1.2) inc. food borne hazards	- Detection and elimination of [adverse] agents in food chain (1.2); - Safe and flexible [...] processes and technologies (1.1) incl. quality monitoring and traceability	[...] role of food in promoting and sustaining health (1.3) [...] inc. particular needs of older persons
CONTROL OF INFECTIOUS DISEASES (K.A. N°2)	- Development of improved or novel [...]vaccines (2.1) inc. food animals; - Strategies to identify and control infectious diseases (2.2) inc. risk of transmission		- Development of improved or novel [...] vaccines (2.1); - Strategies to identify and control infectious diseases (2.2)	- Development of improved or novel [...] vaccines (2.1) inc. wildlife vaccination; - Strategies to identify and control infectious diseases (2.2) inc. risk of transmission	<i>All three action lines in Key Action N°2 as related to infectious diseases in animals</i>	Development of improved or novel mono-component, multi-component and combined vaccines (2.1) inc. immunisation strategies for older persons
THE «CELL FACTORY» (K.A. N°3)	- Improving the diagnostic and therapeutic arsenal for health care (3.1); - New bio(techno)logical processes/products [...] (3.3)	Improving the diagnostic and therapeutic arsenal for health care (3.1) inc. vaccine production, therapeutics and diagnostics		- Improving environmental sustainability (3.2) inc. devices, biosensors, monitoring GMOs and measurement of pollution	New bio(techno)logical processes/products [...] (3.3) inc. products and processes derived from plants and farm animal	Improving the diagnostic and therapeutic arsenal for health care (3.1)
ENVIRONMENT AND HEALTH (K.A. N°4)	- Diseases and allergies related to [...] the environment ... (4.1); - [...]diagnosis, risk assessment, [...] environmental health effects (4.2)	Diseases and allergies related to or influenced by the environment and their prevention (4.1)	- Diseases and allergies related to [...] the environment, ... (4.1); - [...]diagnosis, risk assessment, [...] environmental health effects (4.2)			Diseases and allergies related to or influenced by the environment ... (4.1) inc. special needs of high-risk groups
SUSTAINABLE AGRICULTURE, FISHERIES, AND FORESTRY, [...] (K.A. N°5)	New and sustainable systems of production and exploitation in agriculture, fisheries and aquaculture (5.1) inc. quality policy	New and sustainable systems of production and exploitation in agriculture, fisheries and aquaculture [...] (5.1) inc. animal health and welfare	- New and sustainable systems ... (5.1) inc. breeding techn., GMOs; - The integrated production [...] for non-food uses (5.2); - Sustainable and multi-purpose [...] the integrated forestry-wood chain (5.3)			
THE AGEING POPULATION AND DISABILITIES (K.A. N°6)	Demographic and social policy aspects of population ageing (6.3) inc. lifestyle determinants	Age-related illnesses and health problems (6.1)	Determinants of healthy ageing [...] (6.2) inc. cellular and molecular mechanisms of ageing	Demographic and social policy aspects of population ageing (6.3) inc. environmental determinants		

**TABLE 2/1: INTERFACES BETWEEN THE KEY ACTIONS OF THE SPECIFIC PROGRAMME « QUALITY OF LIFE AND MANAGEMENT OF LIVING RESOURCES » AND THE OTHER THREE THEMATIC PROGRAMMES**

	THE USER-FRIENDLY INFORMATION SOCIETY	PROMOTING COMPETITIVE AND SUSTAINABLE GROWTH	ENERGY, ENVIRONMENT AND SUSTAINABLE DEVELOPMENT	
FOOD, NUTRITION AND HEALTH (K.A. N°1)	- Personal health systems inc.supporting health status at home, work and leisure	<p>Generic Activities (3):</p> <ul style="list-style-type: none"> <li>- Materials and their technology for production and transformation (3.1) inc. new and improved materials for food, health and other sectors (eg advanced functional materials for implants and invasive devices);</li> <li>- Measurements and testing (3.3) inc.technical support to standardisation and Community policies and to the development of certified material</li> </ul>	Sustainable city planing and [...] management (4.1) inc. safety and availability of essential supplies	
CONTROL OF INFECTIOUS DISEASES (K.A. N°2)	- Health inc. systems for health professionals		Treatment and purification technologies (1.3) inc. infectious contaminants in water	
THE «CELL FACTORY» (K.A. N°3)	- Personal health systems inc. dev't. of advanced biosensors, transducers and microsystems		Innovative products, processes and organisation (2.1) inc. eco-efficient design and technol.; new and miniaturised products and processes	<ul style="list-style-type: none"> <li>- Treatment and purification technologies (1.3) inc. novel biotechnologies;</li> <li>- Pollution prevention (1.4) inc. novel bioremediation and bio-sensors</li> <li>- Assessing [...] biodiversity (2.2.3)</li> </ul>
ENVIRONMENT AND HEALTH (K.A. N°4)	- Intelligent environmental monitoring and management			<ul style="list-style-type: none"> <li>- Treatment and purification technologies (1.3) inc. drinking water;</li> <li>- Understand [...] predict global change processes (2.1) inc. scenarios of risks to human health</li> <li>- Sustainable city planing [...] and management (4.1) inc. optimising urban environmental quality;</li> <li>- Research and technological development activities of a generic nature: radiation protection and health</li> </ul>
SUSTAINABLE AGRICULTURE, FISHERIES, AND FORESTRY, ... (K.A. N°5)	- Intelligent environmental monitoring and management		<ul style="list-style-type: none"> <li>- Eco-efficient processes and design (1.3);</li> <li>- Materials and their technologies for production and transformation (3.1) inc. sustainable chemistry</li> </ul>	<ul style="list-style-type: none"> <li>- Treatment [...] technologies (1.3) inc wastewater re-use;</li> <li>- Pollution prevention (1.4) inc. combating diffuse pollution;</li> <li>- Surveillance, [...] and communication systems (1.5) inc. management and control systems;</li> <li>- Regulation of stocks ... (1.6) inc. technol. and manag. tools;</li> <li>- Scenarios and strategies for responding to global issues (2.3) inc. reconciling conservation of biodiversity with farming, forestry and land use changes;</li> <li>- Reducing anthropogenic impact [...] on marine ecosystems and biodiversity (3.2)</li> </ul>
THE AGEING POPULATION AND DISABILITIES (K.A. N°6)	<ul style="list-style-type: none"> <li>- Persons with special needs inc. persons with disabilities and older persons</li> </ul>			
	Cross-programme themes (3.1): Design for all for an inclusive information society (CPA3)	<ul style="list-style-type: none"> <li>- Innovative products, processes and organisation (2.1)</li> <li>- Sustainable mobility and intermodality (2.2)</li> </ul>		

**TABLE 2/2 : INTERFACES BETWEEN THE ACTIONS OF THE SPECIFIC PROGRAMME « QUALITY OF LIFE AND MANAGEMENT OF LIVING RESOURCES »  
AND THE HORIZONTAL PROGRAMMES AND THE JOINT RESEARCH CENTRE PROGRAMME**

	CONFIRMING THE INTERNATIONAL ROLE OF COMMUNITY RESEARCH	INNOVATION AND PARTICIPATION OF SMES	HUMAN RESEARCH POTENTIAL AND THE SOCIO-ECONOMIC KNOWLEDGE BASE	JOINT RESEARCH CENTRE
FOOD, NUTRITION AND HEALTH (K.A. N°1)		Coordination and support activities relating to Innovation and Small and Medium Enterprises participation (IV-A and IV-B)	<ul style="list-style-type: none"> <li>- Support for training and mobility of researchers, through research training networks and Marie Curie fellowships (complementing those within the "QOL" programme);</li> <li>- Enhancing access to research infrastructures, through cooperation networks and RTD projects;</li> <li>- Promoting S&amp;T excellence, through conferences, distinctions and public awareness activities;</li> <li>- Improving the socio-economic knowledge base, including coordination and support of socio-economic research activities of thematic programmes;</li> <li>- Support for the development of S&amp;T policies, through strategic analysis of specific political issues, and establishing a common basis of S, T &amp; Innovation Indicators.</li> </ul>	<p>"The mission of JRC is to provide customer-driven scientific and technical support for the conception, development, implementation and monitoring of Community policies. As a service of the European Commission, the JRC functions as a reference centre of science and technology for the Community. Close to the policy-making process, it serves the common interest of the Member States, while being independent of commercial or national interests.</p> <p>Carrying out specific high-level research in close contact with industry and other bodies, the JRC supports the policy maker in addressing the concerns of the individual citizen, improving the interaction between man and the environment and promoting sustainable development.</p> <p>In implementing its mission, the JRC will endeavour to coordinate RTD activities carried out in the Member States. Its work depends upon intensive networking with public and private institutions in the Member States through, for example, research networks, joint projects or staff exchanges. This is important because the JRC's mission is complementary to the indirect action part of the Fifth Framework Programme; while the indirect actions will continue to be the main mechanism for developing and testing new ideas, the JRC's role is to help apply them in the service of the policy maker."</p> <p>(Annex II to Council Decisions on JRC specific programmes)</p> <p>Therefore the JRC focuses its RTD projects at the interface of science and technology with Community policies. For more information on the JRC Work Programme, please visit the JRC home page at <a href="http://www.jrc.org">http://www.jrc.org</a>.</p>
CONTROL OF INFECTIOUS DISEASES (K.A. N°2)	Co-operation with third countries(A): - Improving health care in a changing society (A.2b); - Promoting healthy societies (A.3d); - Tools for sustainable development (A.4b)			
THE «CELL FACTORY» (K.A. N°3)	Co-operation with third countries(A): - Environment and industry, problems of selected regions and sectors (A2a) inc. biotreatment and recycling, environmentally benign technologies; - Tools for sustainable development (A4b) inc. plant and animal production technologies (eg breeding, biological nitrogen fixation)			
ENVIRONMENT AND HEALTH (K.A. N°4)				
SUSTAINABLE AGRICULTURE, FISHERIES, AND FORESTRY, ... (K.A. N°5)				
THE AGEING POPULATION AND DISABILITIES (K.A. N°6)				

TABLE 3: "GENOME RESEARCH FOR HUMAN HEALTH"

TYPE OF ACTIVITY			Deadlines for submitting proposals		
KEY ACTIONS			February	March	October
TITLES	AREAS				
<b>1. Food, nutrition and health</b>	1.3 Research into the role of food in promoting and sustaining health	1.3.2 Role and impact of food on physiological functions, physical and mental performance. <sup>1</sup>		X	
		1.3.3 Cellular and molecular mechanisms underlying links between diet and chronic diseases and disorders <sup>1</sup>			
<b>2. Control of infectious diseases</b>	2.1 Development of new vaccines <sup>1</sup>				X
	2.2 Strategies to identify and control infectious diseases <sup>1</sup>				
<b>3. The Cell Factory</b>	3.1 Improving the diagnostic and therapeutic arsenal for health care	3.1.1 Development of new diagnostics <sup>2</sup>			X
		3.1.3 Therapeutic strategies			
	3.3 New biological and biotechnological products and processes for agro-industry, agri-food and high value added chemicals	3.3.3 Functional biomolecules and biocatalysts		X	
<b>4. Environment and Health</b>	4.1 Diseases and allergies related to the environment	4.1.1 Analysis and quantification of the impact of environmental factors on human health <sup>1</sup>			
	4.2 Assessment and reduction of environmental health hazards	4.2.3 Improved methods and technologies for long and short-term exposure and effects assessment including biomarkers (and bio-indicators) of environmental exposure, and susceptibility to environmental agents.		X	
<b>5. Sustainable agriculture, fisheries and forestry and integrated development of rural areas, including mountain areas</b>	5.1 New and sustainable systems of production, including breeding methods in agriculture, fisheries and aquaculture	5.1.1 Sustainable agriculture <sup>1</sup>			X
<b>6. The ageing population</b>	6.1 Age-related illnesses and health problems <sup>1</sup>			X	
	6.2 determinants of healthy ageing and of well-being in old age <sup>1</sup>				
RTD ACTIVITIES OF A GENERIC NATURE					
TITLES	AREAS				
<b>8. Genomes and diseases of genetic origin</b>	8.3 Development of novel expression systems, model organisms, mutant, transgenic and hybrid organisms				
	8.4 Development and application of underpinning biochemistry, biophysical, statistical and computational approaches				X
	8.5 Integrated projects in genomics and human health <sup>4</sup>			X <sup>3</sup>	
<b>12. Bioethics</b>	12.1. Ethical aspects of scientific and technological developments		X		
RESEARCH INFRASTRUCTURES					
			X		X

<sup>1</sup> Genomic component included in the general call or only part of the area open in the field of Genomes

<sup>2</sup> Only demonstration projects

<sup>3</sup> Deadline (09/02/2001) for expressions of interest for research topics in genomics and human health only

<sup>4</sup> Integrated projects include RTD projects, concerted actions, thematic networks and host fellowships