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EuCheMS input on
Consultation on the ERA Framework: Areas of untapped potential for the development
of the European Research Area (ERA)

Researchers

One of the achievements of the Bologna process is that the standards of university education at the Bachelor and Masters level were harmonised within Europe. This was sometimes compromised by lowering quality criteria. Europe not only needs more researchers in general, but also a higher proportion of top researchers, both in industry and academia. This can only be achieved by transparent, but uncompromised qualification criteria in all career stages. The point at which the status of an independent researcher is reached must be clearly defined and should be approximately the same in all European countries.

1

There must be public consensus throughout Europe that research and researchers secure our living standards and our future. If researchers are the first to be dismissed in economic crises and research positions in the public sectors (universities) are cancelled first when the budget is tight, then researcher careers cannot be expected to be attractive.

In order to attract brilliant young minds to careers in research, the following issues need to be addressed:

- Research careers are difficult to plan and connected with a high degree of uncertainty in most European countries. Clearer perspectives for young researchers regarding the career path and realistic options for a non-temporary position are therefore highly desirable.
- In addition, remuneration for scientists in public institutions is often non competitive with jobs in industry. If Europe wants to attract the best to research, it needs to offer them attractive conditions.
- Furthermore, more care must be taken to ensure compatibility of family and job. This applies in particular to young parents who need possibilities to be both, good parents as well as excellent researchers. The increasing phenomena of dual career couples must be taken into account.
- The research/teaching/administration balance for academic researchers needs to be understood and, where necessary, changed to make researcher careers attractive



to early career stage researchers. Too many talented researchers are being lost from the research community due to cumbersome bureaucracy.

More persons with researcher careers are needed in top industrial and governmental positions. This requires easier possibilities to move from the public into the private sector and vice versa.

A big obstacle in researchers' mobility is national legislation and administrative rules. Although freedom to settle in any European country is guaranteed, national bureaucracies sometimes stipulate deterrent resident rules on persons from other European countries (such as special registration procedures or identification documents, etc.). Different working conditions, such as salary, vacation, health insurance and other benefits are another barrier for mobility. Transferability of pension schemes and social security has been tackled, but is still an issue.

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The fact that mobility is not balanced, i.e. there are countries/regions in Europe which are attractive and others which are much less so and hence the former gain while the latter lose more and more researchers, is a political problem. This may be partly connected to the language problem within Europe which should not be underestimated. This is typically not a problem in multi-national companies or at the postgraduate level of universities. It is a problem, however, for transnational cooperation with SMEs and partially in the early stages of university education and research training. The predominance of English as the *lingua franca* in the sciences leads also to inherent disadvantages of non-native English speaking scientists. It is well known that recipients of scientific information – even if only subconsciously – correlate the quality of presentation with the quality of the research itself.

The over-arching criterion for whatever initiatives should be research excellence as ultimately this will maximise competitiveness of the ERA in the global context and benefit citizens by the innovation outputs of the ERA. The focus should be on developing mechanisms to support collaboration, sharing of resources, infrastructure and knowledge and broadening of research experience across all career stages. Although mobility is one very important ingredient in creating these mechanisms, it should not be considered as an end in its own right. Initiatives which prioritise regional issues and mobility over excellence are likely to reduce the overall competitiveness of the ERA. Mobility within one country as well as to and from the ERA is as important as mobility between member states.



Researchers: key messages

- Europe not only needs more researchers in general, but also a higher proportion of top researchers, both in industry and academia.
- There must be public consensus throughout Europe that research and researchers secure our living standards and our future.
- Europe shall make research more attractive.
- Mobility from public to the private sector and vice versa shall be encouraged.
- National legislation is often an obstacle to mobility.
- Mobility needs to become more geographically balanced.
- Research excellence shall be the ultimate criteria.

Cross-border operation of research actors

3

Cooperation is not a value by itself. Scientists, both in academia and industry, will look for cooperation of their own accord if this is necessary to achieve particular goals. Especially researchers in smaller countries or countries with a less developed research infrastructure may encounter difficulties to find the most suitable partner within their own country and thus depend on international cooperation. Here are systemic opportunities for better use of the cohesion funds, so that brilliant researchers that have studied outside Europe or in some research centre of a large member state can set up an own research group in a their own country. Researchers will always look for the most efficient and interesting way of cooperation. For the researcher the bottom line is whether the cooperation adds value to his/her own research career. The researchers themselves must decide to enter into alliances. Formal ties between research institutions can help, but the individual researcher has to be at the centre. Joint research programs with pre-defined subjects make only sense in certain areas (“big challenges”) and should be avoided where possible. Innovative financing tools, such as micro-financing of promising and enterprising researchers should be investigated, so as to prevent promising scientists to seek careers outside Europe.

“One size fits all” does not work. Many challenges need critical mass and cross-border approaches, in particular if large infrastructures are needed. On the other hand, many research projects work just fine within a small team and no cross-border approaches are necessary. For large-scale research programmes or hubs a coordinated approach is necessary from the stage of initial development of goals and planning through to implementation. In those areas where cross-border approaches make sense, the complete process should be a coordinated one.



Big obstacles towards a closer cooperation within Europe are prohibitive bureaucracy (of EU-funded projects, for example), lengthy application and decision-making processes, capricious funding decisions as well as too big consortia.

An additional problem is that the decision making processes differ significantly from country to country and are therefore often not compatible with each other.

In-between national funding of research projects and EU-funded projects, schemes for funding projects between 2-3 research groups in different European countries are rare. In an ideal world, any European researcher should be able to apply for funds for joint research with another researcher in any other European country under at least comparable application and selection procedures. In chemistry, the open calls of ERA Chemistry were a big success and a big step forward in this respect.

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The task of national funding agencies is to serve their R&D community. The available funds and the funding philosophy vary from country to country and are bound to national legislation and administrative rules. National funding agencies will only enter joint programming initiatives if this serves their constituency and their national research policy, or if this is supported by an additional budget. There are significant reservations by national funding agencies but also by the researchers if national funding is to be used to support European research. Top-down attempts to transfer funds from the national agencies to European research funding agencies (even the ERC) would certainly face strong resistance. Therefore, the national funding agencies should be encouraged to continue their own, bottom-up initiatives to establish cooperation schemes across Europe to facilitate cross-border funding. Joint programming must add value to the nationally funded initiatives.

Cross-border operation of research needs to be driven by excellence; collaborations must be based on complementary expertise and capability without the imposition of geographical considerations. Quality standards must be the same and selection criteria must be compatible. It is also essential to maintain a balance between fundamental (“blue-skies”) and directed research in transnational programmes that seek to address global challenges.



Cross border operation of research actors: key messages

- Possible use of cohesion/structural funds to be investigated in this context; innovative financing tools to be applied.
- Researcher shall be in the centre.
- Bureaucracy to be decreased.
- National decision making process to be harmonized, where relevant.
- Cooperation between few research groups from different countries shall be encouraged.
- The national funding agencies should be encouraged to continue their own, bottom-up initiatives to establish cooperation schemes across Europe to facilitate cross-border funding. Joint programming must add value to the nationally funded initiatives.
- Balance between fundamental and directed research shall be maintained.

5

Research infrastructure

Top-notch research infrastructure is essential for European researchers and research institutions to compete worldwide. The quality of the research base across the ERA can be increased by projects or hubs which concentrate a critical mass of infrastructure and/or expertise in a way that no individual member state can. National and European research infrastructures should be well synchronized and interlinked to optimize the impact of investments. This requires mechanisms for local centers of excellence to interact with larger hubs, for example through mobility grants and infrastructures. When infrastructure is mentioned, this is often considered to be equivalent to laboratories and research facilities. The fact of having challenging and interesting biotopes of scientists in international and multi-disciplinary centers is likely to be as important however.

Access to research infrastructure must be excellence-based and controlled by peers. Each European researcher should have the possibility to access the research infrastructure required to carry out his/her work. This means that models have to be developed to share (national) resources across the borders. Through the use of structural funds, research infrastructures could become a tool to alleviate the heterogeneous research environment in Europe. A large infrastructure facility in a more remote location could be a seed to improve the scientific attractiveness of that region. The recent approach of the EU to identify research infrastructures of strategic pan-European relevance through the ESFRI should be continued. Scientists must be involved in all stages of the planning and evaluation process.



Overall, funding for infrastructure needs to be strategic and long-term (meaning that it includes depreciation and recurring staff and other costs). There needs to be clear ownership of facilities in terms of both administration and collaborative research outcomes.

Research infrastructures: key messages

- High quality research infrastructure, which shall be appropriately accessible to researchers, is essential.
- The recent approach of the EU to identify research infrastructures of strategic pan-European relevance through the ESFRI should be continued.
- Scientists must be involved in all stages of the planning and evaluation process.

Knowledge circulation

6

There must be a clear consensus on the tasks of each sector (who is doing what). Research with long-term perspectives is to a very high proportion done at university and non-university research institutes. Such research is essential to secure our future; without a steady supply of new knowledge and insight, no future innovation would be possible. Experience in chemistry shows that the timeframe between new discoveries and their applications is about 20-30 years.

Industrial R&D has a much shorter time horizon. Especially SMEs often expect “ready solutions” from academic partners. The problems associated with knowledge transfer from universities to industry are therefore often due to different time scales. EuCheMS strongly opposes any attempt to shift the focus of university research from the long-term perspective towards short-term research goals. This would lead to a profound change in Europe’s university system and would have severe negative consequences in the future.

Another unsolved problem is the way intellectual property (IP) is being treated in industry/academia cooperation.

For an improvement of knowledge transfer between academia and industry, structures are required which bridge the gap between universities and industry. Such institutions must be explicitly dedicated to the knowledge transfer, like the German Fraunhofer Institutes, the French Carnot Institutes or the UK Technology and Innovation Centres. They could of course be associated to universities, but must be clearly distinct in their operation principles. In this context, the European Commission Joint Research Centre could possibly play an important role.



Increased links and communication between the national technology innovation centres could avoid duplication and maximize synergies. The strategy and effectiveness of knowledge transfer mechanisms varies between member states so there is an opportunity to share best practice. Any overall framework will need to take account of the national histories and models for knowledge transfer.

In addition, a closer entanglement on a personal basis between industrial and academic research is desirable, since the industrial and the academic world depend on each other. To enhance the mutual understanding, universities and companies should offer opportunities to scientists from the other sector for short to medium term visits to introduce them into the specifics of the actual research activities. Industrial researchers would benefit from being introduced into the latest research topics and techniques while academic scientists could learn what the specific needs of research in the private sector are.

7 Lack of open access to publications is not considered to be a major obstacle for knowledge transfer, because, from a technical point of view, most publications are electronically accessible in an easy manner. Open access currently seems to be a highly political issue. A close involvement of the players, i.e. scientists, publishers and learned societies is missing. Open access still contains many unsolved open questions and is certainly not the panacea as the Commission claims. Open access is, among others, a financial question, i.e. whether the “producer” or the “consumer” of knowledge bears the costs. The current situation with regard to open access is very unsatisfactory: most of the “open access journals” in chemistry have low quality (low impact) and are therefore not accepted by the scientific community, and publishing “open access articles” in established journals is very expensive. Even if funding agencies bear the costs of open access publishing (as some funding agencies do), this money is part of the total research budget and cannot be spent otherwise for research expenditures or salaries. Thus, any attempt to promote open access of publications must address the problem of quality control and the financial problems first. In “author pays” open access not only the quality of the contribution but in addition the availability of funds to pay decides about publication. This additional barrier must not impede the publication of results such that every author - independent of origin, discipline, academic and funding status - is able to have their high quality results published in adequate journals.



Knowledge circulation: key messages

- Inherent differences between academic and industrial R&D shall be taken into account.
- Institutions, especially dealing with knowledge transfer between academia and industry, can be instrumental.
- Personal collaboration between researchers from academia and industry shall be encouraged
- Basic questions associated with open access to be discussed.

International dimension

8 On a bigger scale, the basic problem for cooperation between European and third countries is the same as within the EU, which is protectionism. As long as there are no or insufficient international rules for the exploitation of research results and other intellectual property issues, cooperation possibilities will be restricted. Everything said above about joint programming, research infrastructure, etc. apply here also.

EuCheMS is strongly supporting the European “green card” for researchers from non-EU countries. Visa applications and visa extensions for researchers and their families are often very tedious and capricious, and prevent them from coming to Europe. Europe must convey researchers the message that they are more than welcome instead of treating them as potential suspects.

International dimension: key messages

- Developing international rules for exploitation of research results are to be considered.
- “Green card” for researchers from non-EU countries shall be encouraged.

Managing and monitoring the ERA partnership

Research in Europe is highly structured and diversified.

The ratio between bottom-up vs. top-down research or curiosity-driven vs. application-driven research in the European countries is very divergent and depends very much on national research policies. Funding of curiosity-driven research at the European level (through ERC) was only established recently, but turned out to be a big success story. EuCheMS strongly



recommends to strengthen this successful instrument, which is an important ingredient for the ERA.

European research policy competes with national and sometimes regional policies. EuCheMS recommends strengthening the dialog between policy makers at national, regional and European level, as to optimize the approach.

Different funding cultures have developed in different countries. This includes different evaluation and decision-making processes, different funding philosophies (e.g., some countries only fund thematic programs) as well as different quality requirements. EuCheMS recommends mapping the current situation (as was already started to do by the ERA Chemistry network), as to harmonise approaches, where relevant and possible.

In some European countries, research is only done in companies and universities, while other countries have specific research institutes (e.g. academy institutes, CNRS in France, Max-Planck, Helmholtz, Leibniz and Fraunhofer societies in Germany, etc.). EuCheMS recommends to prepare a document analyzing the current situation and describing advantages and disadvantages of each of the approaches, taking all relevant factors into account.

9

Technology and knowledge transfer from basic research to industry is institutionalized in different ways. In many countries, all or nearly all applied research is done at universities, while other countries have structures in-between universities and industry. EuCheMS recommends promoting some best practices from the national or European level.

This diversity is unique. There is a danger that resources are scattered, but this situation also offers great opportunities. Creativity and innovation very often result from very specific research environments and circumstances. EU research policy would therefore be ill advised to enforce conformity. It should concentrate on transnational issues, where cooperation and coordination of efforts has clear added value for Europe. Some research topics are better kept at the national level. Duplication of efforts must be avoided for economic reasons, but scientific and technical competition should not be prevented. An appropriate balance between curiosity-driven and application-driven research must be maintained.

A huge untapped potential for Europe is to activate dormant capacities in European countries (mostly in east and southeast Europe), where researchers often are not yet fully competitive with those from other parts of Europe. This is not a question of intellectual capacities, but often a question of insufficiently changed research environment and infrastructure. EuCheMS is strongly in favor of using structural funds to improve this situation. Further improving gender equality is yet another potential which is kept unused.



European Association for Chemical and Molecular Sciences
Association Européenne pour les Sciences Chimiques et Moléculaires
Europäische Vereinigung für Chemische und Molekulare Wissenschaften

Managing and monitoring the ERA partnership: key messages

- Diversity in research in Europe shall be taken into account, not enhancing conformity.
- ERA partnerships should concentrate on transnational issues, where cooperation and coordination of efforts has clear added value for Europe.
- Duplication of efforts must be avoided for economic reasons, but scientific and technical competition should not be prevented.
- An appropriate balance between curiosity-driven and application-driven research must be maintained.
- Structural funds to be used to better geographically balance research.
- Gender equality is not yet fully exploited potential.

About EuCheMS

The European Association for Chemical and Molecular Sciences (EuCheMS) is a non-profit association. Its mission is to promote cooperation in Europe between non-profit scientific and technical societies and professional institutions in the field of chemistry whose membership consists largely of individual qualified chemists/chemical scientists and whose interests include the science and/or practice of chemistry/ chemical sciences. It was founded in 1970 and has over 40 member societies in more than 30 countries, together representing about 150,000 chemical scientists.