

RRI institutional change in biosciences organisations

Deliverable D8.7



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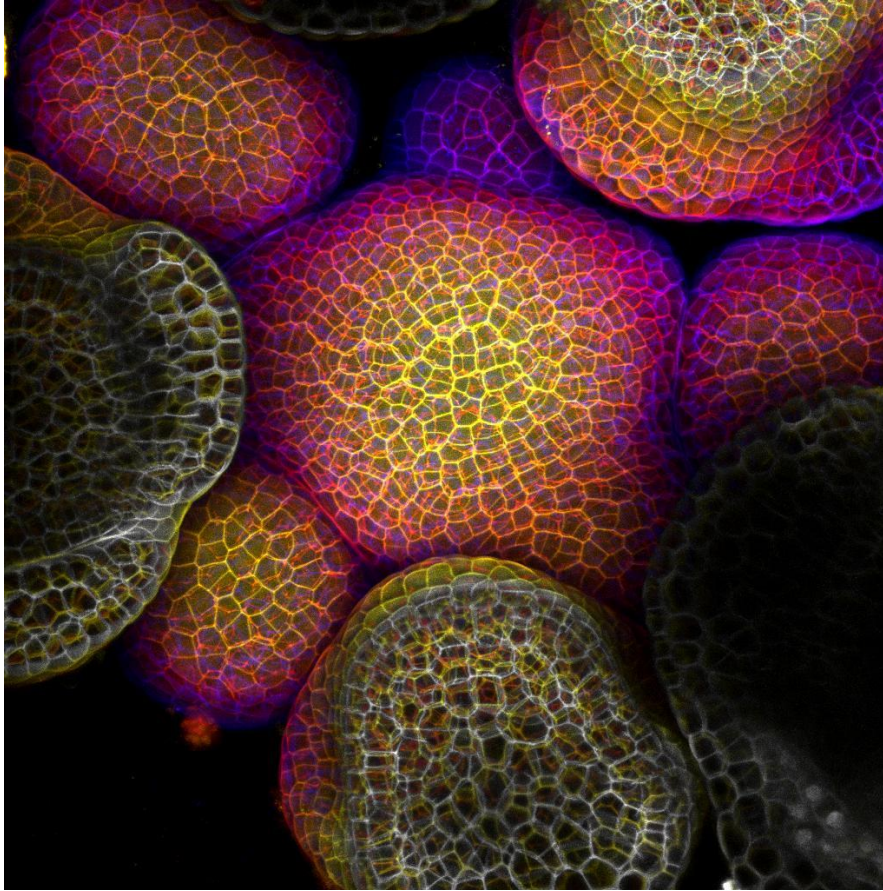
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(By ZEISS Microscopy)

Policy brief No 2

“RRI institutional change in biosciences organisations”

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Executive summary

Biosciences have a growing relevance in the contemporary world, therefore they are exposed to strong social and political pressure, in a context in which society is profoundly changing, as are the internal mechanisms of science.

Biosciences – even more than other research sectors – have become a field characterised by hyper-competition. At the same time, biosciences are the field where, more than anywhere else, the question of responsible science has arisen and new approaches, practices and solutions have been developed.

This document is focused on RRI institutional change in biosciences organisations and draws inspiration from the work done within the ResBios project, especially regarding the activation of sustainable RRI institutional changes in four implementing organisations in Croatia, Greece, Spain and Ukraine, and the drafting of a Manifesto on responsible biosciences.

Some recommendations are formulated, regarding: Keeping responsibility as a common policy horizon for science and scientists; Favoring cross-cutting coalitions for scientific and experiential exchanges and learning in this field; Deeping and scaling-up knowledge and experience about RRI institutional change; Promoting a shared view and collaboration about RRI institutional change involving social scientists and STEM researchers; Promoting and clarifying the communication about responsible approaches in R&I.

The ResBios project aimed to further develop and embed practices of Responsible Research and Innovation (RRI) in bioscience organisations (see box below).

Under the ResBios Project, two policy briefs have been planned. The first one focused on the importance of mutual learning during a period of profound and complex transformations in the relationship between science and society.

This second policy brief is focused on RRI institutional change in biosciences organisations and draws inspiration from the work done within the project, especially regarding the activation of [sustainable RRI institutional changes in four implementing organisations](#) in Croatia, Greece, Spain and Ukraine, and the drafting of a [Manifesto on responsible biosciences](#). Please refer to the documents cited for further information. A particular attention is attributed to the changing relations between biosciences and society and to the different features of institutional change.

The text is directed above all to research institution directors and managers, to their networks, and more generally to all researchers, stakeholders and policymakers interested in reflecting on these topics, which have a strong impact on the meaning and effectiveness of their work.

THE RESBIOS PROJECT AND ITS MAIN OUTPUTS

In the framework of the ResBios project, 15 RRI Grounding Actions have been implemented to achieve sustainable institutional changes in four research organisations in Croatia (Zagreb University, Faculty of Agriculture – UNIZG-FAZ), Greece (Democritus University of Thrace, Department of Molecular Biology and Genetics - DUTH), Spain (Consejo Superior de Investigaciones Científicas - ICM-CSIC), and Ukraine (University of Lviv, Department of Biochemistry – IFNUL), supported by technical assistance, communication, evaluation, mentoring and mutual learning actions.

The Grounding Actions (GAs) were related to RRI keys (public engagement, gender, education, open access, ethics) and take into consideration the MoRRI indicators while being aligned with the Sustainable Development Goals. In the ResBios' approach, the four RRI dimensions (anticipation, reflexivity, inclusiveness, responsiveness) are both a tool to support the Grounding Actions and tools for governing the changing science /society relationship.

The GAs have had as their objects: experimenting and establishing informal education activities; promoting lifelong learning programmes; capacity building on RRI for university students and researchers; establishing cooperation and networks with schools; setting up a system of support for ethical principles in the biological investigation; developing open access and open innovation policies; setting up a system for fighting plagiarism and promoting ethical publishing behaviours; redefining research ethics, procedures and codes on biosciences emerging needs; assessing the current situation about gender at the university level; enhancing gender equality commitment within the research organisation; promoting citizens engagement programs and citizen's empowerment in neighbourhoods.

Based on these actions:

- 23 “success stories” of institutional change have been collected
- Some methodological and practical tools for dialogue with society have been formalised
- A Manifesto was launched, titled “Responsible Biosciences. A Manifesto for the Transformation of Science-Society Relations”
- An International Network for Responsible Biosciences (INRB) has been created.

1. Biosciences and society

The starting point for reflecting on the RRI institutional change in the biosciences, from an operational perspective, is to understand the changes in which the biosciences themselves are involved today.

Directly or indirectly, *biosciences* play a decisive role in many of the challenges facing contemporary societies, related to the environment, climate change, food security, supporting an ageing population, developing new materials, preventing and managing pandemics, the fight against cancer, obesity, and chronic diseases, etc. Partly because of their growing relevance, biosciences are exposed to strong social and political pressure, in a context in which society is profoundly changing, as are the internal mechanisms of science.

Biosciences – even more than other research sectors – have become a field characterised by *hyper-competition*, which is having different unintended consequences in terms of, e.g., loss of career perspectives for young researchers, unjustified race to publish, increased non-

replicability of research data and experiments, and demotivation of researchers to undertake long-term, highly creative and scientifically uncertain projects. At the same time, biosciences are the field where, more than anywhere else, the question of *responsible science* has arisen and new approaches, practices and solutions have been developed, in terms of ethical issues and societal acceptance of scientific products.

In this framework, numerous experiences carried out at global, European and national levels by research organisations, private firms, and civil society organisations, should be considered, as well as the strategies developed by the EC related to RRI, Open science, Citizen science and more.

RRI AND ITS ACTORS

(...) Four dimensions summarise the thrust of RRI: it requires *anticipation* of the future societies that we wish for, *reflexivity* by researchers and innovators on the effects of their work, the *inclusion* of relevant stakeholders, and *responsiveness* to the needs and ambitions of society as well as to the intermediate research results. For policy purposes, this is often translated into the six RRI 'key' areas of the science-society relationship: public engagement, gender, education, open access, ethics, and research governance. Over time, the reflection on responsibility in science has also led in Europe to a more significant investment in and a better understanding of the complex relationships between science and society, no longer grasping them as opposing entities ("science and society") but interpreting the former as fully incorporated, for good and for evil, in the latter ("science with and for society").

One implication of RRI – and of three decades of work in STS (Science, Technology & Society studies) and approaches such as Open Science, Citizen Science, Broader Impact, etc. – is that also knowledge provided by non-scientists (in the sense of not being trained in universities) is valued. This is the basis for the involvement in research and innovation programs of actors in the so-called 'quadruple helix' (university-industry-government-public), and for collaboration between researchers and citizens in numerous experiences all over the world (e.g., citizen participation in research on the Zika pandemic in Brazil; citizen forums for reforestation programs in Indonesia; numerous European and Northern Americans projects involving citizens in fields such as nature conservation, archaeology and astronomy; the involvement of fishermen and divers in the conservation of the environment in South Africa). (...)

Excerpts from "Responsible Biosciences. A Manifesto for the Transformation of Science-Society relations", ResBios 2022

As stated in the ResBios Manifesto, the growing weight attributed to responsibility in science and the strengthening and scaling up of experiences that refer, in different ways, to responsibility are leading to a new "social contract" about science-society relationships based on an extended idea and practice of responsibility. In the following box, three characteristics of an extended concept of responsibility are illustrated.

RESPONSIBILITY: AN EXTENDED CONCEPT

(...) Our extended concept of responsibility needs to be developed at different levels; to make it effective, it also needs embedding in the global mechanisms of science, in addition to the local and national levels. Only by ingraining responsibility in all these levels, responsibility can play its broader role, becoming useful for managing research, reducing wastage of time and resources, preventing any risk science and technology can generate in society, and reducing the unintended negative consequences of competition. This extended idea of responsibility aims at improving the lives of researchers, the functioning of research organisations, and their relations to society. Some elements of this extended concept of responsibility are the following (...).

Responsibility by design. Responsibility underlines that science is not routine work, especially in a fragmented and diversified society. The aims, use and consequences of research products are not self-evident and need to be selected and planned consciously. Whether this is done by individual researchers or by organisations or even governments, a specific view of science and science-society relations will inform such choices. So, some kind of ‘responsibility-by-design’ as part of the research process should be defined.

Responsibility offers a critical stance for observing science. Responsibility builds on the recognition that science has many internal problems to face, and many transformations to manage. By offering a critical stance, responsibility should help to prevent redundant papers, fake journals, distortions in research metrics, non-reproducibility of data, a hostile work environment for young researchers, women and minorities, etc. Such critical responsibility would strengthen inter- and trans-disciplinary work with impacts on, for example, university structure, peer-review system, and the publication markets.

Responsibility as a criterion to reshape science-society relations. Science is losing the special status of autonomy that it held in the old social contract. This shift needs to be managed and not simply endured. The blurring of boundaries between science and other societal systems should entail changes in research practices, research organisations and research systems. Responsibility could then be used to mitigate a potential decrease in trust in science, the risk to subordinate science to external influences, and the risk of over-accelerating the shift from discovery to innovation. Responsibility would also help scientists to better interpret and play their role as experts for policymaking and would provide practices and orientation for a smart inclusion of stakeholders in the research process. In this sense, responsibility could be viewed as one of the regulatory principles to help manage these processes, preventing risks and seizing opportunities.

Excerpts from “Responsible Biosciences. A Manifesto for the Transformation of Science-Society relations”, ResBios 2022

However, this process is not occurring smoothly, and its outcomes are not obvious.

Within this framework, the ResBios project moves from the idea that the problematic relations between R&I and the whole society (its low degree of “socialisation”) is primarily originated from the lack of effective *institutional spaces* (a set of shared rules, interpretations and means of interaction) allowing scientific organisations and other societal actors to interact and cooperate.

The next paragraph is dedicated to the different contexts, levels, and ways in which it is possible to create or expand these institutional spaces.

2.RRI institutional changes: where, what and how

In a phase in which we are witnessing numerous experiences of “responsibility” in the field of R&I, but in which there is also strong pressure on a highly competitive science, there is a risk that any innovative experience, without sustainable investment in terms of vision, human, financial, organisational resources, networking and continuous mutual learning (locally, nationally and globally) could be re-absorbed over time into “business-as-usual” practices and approaches, nullifying the results achieved. This was one of the main issues that the ResBios project faced, especially in its final phase.

A new “social contract” in the perspective of responsibility should lead to *institutional changes*, thus translating the novel solutions and practices into sustainable arrangements.

First of all, “where” is it possible to foster these institutional changes?

In this respect, we can indicate four different contexts where R&I primarily develops, namely:

- *Local-organisational contexts*, that is the closer contexts for researchers and their direct stakeholders, even though it is strongly mixed with inputs from others
- *Disciplinary-professional contexts*, e.g., biosciences, also with a focus on interdisciplinary and transdisciplinary work
- *Cultural and socio-political contexts*, since local history and traditions, as well as relations with industry, political decision-makers, local authorities, users, and stakeholders do matter, although science is universal
- *Global contexts*, as many aspects of scientific practice play out at a global level: networking, publishing, research collaboration, funding, resource availability, and training capacities.

Each of these contexts requires specific forms of institutional change to achieve a new stable social contract between science and society. The institutional changes at these different levels would, ideally, act synergically and reinforce each other. To support this process, we need to think of the scientific organisations, relevant to these various contexts, to be connected in large and effective networks.

More, introducing “responsibility” in these various contexts implies operating and negotiating at several levels, or in different fields, namely.

- *Physical or virtual space*: the opening of permanent spaces for short terms interactions with society, at any level (for example: webinars, blogs, surveys, and other two-way feedback collection mechanisms, conferences, workshops, training courses, etc.).

- *Social space*: characterised by the establishment of long-term relationships among different actors (establishment of partnerships, medium- and long-term collaborations, networks) or by the establishment of specific offices inside the research bodies and organisations.
- *Normative space*: the establishment of new rules, norms, agreements, and obligations that inserts societal aspects in the daily life of the research organisations, professional associations, scientific research and exchange activities, the scientific cooperation.
- *Symbolic space*: the establishment and dissemination of new visions, symbols, mission statements, and shared interpretations about the relationship between science and society and related to open science.



(Photo: ResBios project)

RESBIOS EXPERIENCE: DEVELOPING RRI INSTITUTIONAL SPACES

The ResBios grounding actions have been focused on the *development of permanent institutional spaces* for making the research organisations more porous to the input of society. In this sense they can be considered as real “anticipatory experiences” of a new social contract between science and society. The institutional change promoted by these actions was oriented to the creation of spaces of different types.

Physical or virtual space

Examples: IFNUL has created a YouTube channel with videos on biochemistry and molecular biology. DUTH has promoted activities of citizens engagement on biosciences through seminars with students and citizens. ICM-CSIC has promoted citizen’s empowerment for ocean responsibility, through specific public initiatives, involving particularly neighbourhood associations. UNIZG-FAZ has promoted new Lifelong Learning activities for professionals not trained in environmental-related disciplines.

Social space

Examples: ICM-CSIC established a network of marine schools and twinning initiative with similar networks. Network creation is being pursued by ICM-CSIC also on gender issues. All the other implementing partners both for designing or for implementing their GAs have created

and/or maintained stable relations with other actors within and outside their organisations (DUTH, for example, has established an agreement with the local Prefecture).

Normative space

Examples: DUTH, UNIZG-FAZ and IFNUL are committed to redefine research ethics, procedures, and codes on Biosciences emerging needs. The Academic authorities of IFNUL recognised formally the establishment of an Open Day Committee at the Faculty of Biology, to regularly promote events for school children and students, teachers and community members. DUTH and UNIZG-FAZ have also promoted an Open Access and/or Open Innovation policy at the faculty level.

Symbolic space

Examples: ICM-CSIC implemented activities aimed, e.g., at enhancing gender equality commitment in the Institute or providing a broader awareness of Oceans for Earth life. DUTH has promoted an assessment of the current situation about gender in bioscience at the faculty level to share the results and discuss this issue. In general, all the GAs implemented will contain “symbolic” elements, since shared visions, as well as information and communication campaigns are needed for involving different actors and people in the activities.

Source: “Collection of Success Stories and SSP revised”, Deliverable D6.1, ResBios, 2022

Institutional change is not a linear cause/effect movement, but a complex social process, where, depending on the context, the same input can produce different outputs and the same effect can be produced through different factors. The same, top-down or bottom-up approaches cannot be considered effective a priori.

So, institutional change should be seen as a permanent learning process, where knowledge production, information management and networking may have a crucial role.

Based on the analysis of the experiences in the field of institutional change, especially in the field of Research & Innovation, five *instruments* seem indispensable, at any level and context:

- A clear goal setting
- Analysis of the relevant contexts, actors, and organisations
- Realisation (implementation, mobilising actors and resources, dealing with obstacles, negotiation, self-reflection, etc.)
- Stabilisation (consolidation, self-assessment, accountability process, etc.)
- Learning.

3. Some policy recommendations

The ResBios experience gives the opportunity to identify some policy recommendations for implementing RRI institutional change (in Biosciences and beyond), addressed to research institution responsible and managers, as well as their associations and networks, and to the decision-makers in this field.

These recommendations are related to the following aspects.

MANTAINING RESPONSIBILITY AS A COMMON POLICY HORIZON

Keeping responsibility as a common horizon for science and scientists is a challenge for the current and future European Community policies, to avoid the risk of wasting the knowledge and experiences cumulated in the last years.

CROSS-CUTTING COALITIONS

It is important to foster cross-cutting coalitions for scientific and experiential exchanges and learning, involving the different communities of scholars and practitioners related to RRI, Open science, Citizen science and other related approaches.

SHARING INFORMATION AND EXPERIENCES

Deepening and scaling-up information and experience about RRI institutional change is a fundamental strategy for maintaining and increase a relevant wealth of knowledge and practices.

COLLABORATION BETWEEN SOCIAL SCIENTISTS AND STEM RESEARCHERS

Since an approach based on responsibility is not the exclusive property of any science, it is crucial promoting a shared view and collaboration about RRI institutional change involving social scientists and STEM researchers.

BETTER COMMUNICATION

Experience shows that RRI and similar approaches are often perceived as too complex or abstract, and not as a way of interpreting and governing the science-society relationship, so promoting and clarifying the communication about responsible approaches in R&I should be encouraged.

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- Mezzana D., Declich A., Berliri M. and d'Andrea L., 2022. "*Collection of Success Stories and SSP revised*", Deliverable D6.1, ResBios, 2022
- Publications from the ResBios project (2020-2022): <https://resbios.eu/resources#publications>
- Publications from the STARBIOS2 project (2016-2020) (Guidelines on RRI implementation in bioscience organizations; Strategic Document and others):
- <https://starbios2.eu/publications/>

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For more information on the ResBios project: <https://www.resbios.eu/>

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