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# **NEW APPROACHES TO SCIENTIFIC EXCELLENCE:**

Experiences and lessons from the  
case of the Millennium Biomedical  
Neuroscience Institute



## NEW APPROACHES TO SCIENTIFIC EXCELLENCE: EXPERIENCES AND LESSONS FROM THE CASE OF THE MILLENNIUM BIOMEDICAL NEUROSCIENCE INSTITUTE

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## I. INTRODUCTION

— The Millennium Biomedical Neuroscience Institute (BNI) is an exemplary case of research Centers of Excellence in Chile.

— In 2019, the project called Knowledge production in contemporary Chile, began a collaboration with the BNI to analyze its organizational dimension and the activities organized by the Culture and Communications (C&C) unit—including the instrument of Strong Participation—as well as to identify its practical consequences in the scientific culture of the organization.

— This report presents the results of our evaluation of the organizational aspects of the Center and their impact on the scientific culture of the team members.

— The set of perceptions, expectations, interests, and organizational practices of its members served to understand the strengths and weaknesses of these types of institutions and, above all, to explore organizational instruments and strategies for the future design of these organizations. The country, where the Center is located, has experienced two socio-cultural milestones (the social uprising on October 18th, 2019, and the COVID-19 pandemic). Such is the context where scientists from BNI experienced C&C activities since the end of 2019.

## II. METHODOLOGY

— Focus groups with different strata of the organization: assistant researchers, staff scientists, lab managers, post-doctoral fellows, master's and PhD students.

— Data organization with Nvivo v12 software.

— Data analysis meetings between the Anillo and the BNI teams.

### III. RESULTS

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## 1. What did we find when we asked about Excellence?

### 1.1 Multidimensional Excellence

- a. Standard aspects.
- b. Mutual recognition.
- c. Interconnecting networks and collaborative work.
- d. Dissemination, guidance, and professionalized management.
- e. Clear and common horizon.
- f. Excellence for all.
- g. Social referents and outreach.

### 1.2 Sustainable Excellence

- a. An organization that gives support and cares about its members.
- b. An organization that gives comprehensive training to its members
- c. An organization that gives recognition to its members.

## 2. What did we find when we asked about the consequences of the activities carried out by the Culture and Communications unit at the BNI?

### 2.1 Goodness of Participation

- a. Gathering so that the center is perceived as existing as such.
- b. Knowing each other despite physical dispersion.
- c. Getting fresh air in the daily routine.
- d. Sharing workplace issues.
- e. Giving space for and satisfying scientific curiosity.
- f. Mapping thematic and technical expertise.
- g. Spontaneously collaborating when gathering.

### 2.2 Implementation of multidimensional and sustainable Excellence through Participation

- a. Socializing elements of multidimensional and sustainable Excellence.
- b. Institutionalizing elements of multidimensional and sustainable Excellence.
- c. Constructing BNI's identity.



## IV. CONCLUSIONS

— From an institutional perspective, the central axes in this new way of understanding and living excellence are the diversification of scientific trajectories (multidimensional excellence) and the valuation of well-being (sustainable excellence).

— Multidimensional excellence and sustainable excellence are crucial and indispensable for the achievement of the scientific excellence expected by the Science, Technology, Knowledge, and Innovation (hereinafter STKI) policies.

— The activities performed by the C&C unit impulse a change in the notion of Excellence both at an individual and institutional level. It influenced the expectations, interests, and needs of BNI community members regarding excellence, while also having organizational implications that promoted multidimensional and sustainable excellence.

— The instrument of Strong Participation, served as an institutional strategy to enable the construction and strengthening of the organizational identity and culture at the BNI, contributing to substantive aspects that do not come to light through the experience of knowledge production itself.

— The activities performed and facilitated by the C&C unit had a role in the catalyzation of the two contextual socio-cultural milestones (social uprising on October 18th, 2019, and the COVID-19 pandemic).

— The autonomy of the Centers of Excellence enables the development of organizational cultures, which support the institutionalization of multidimensional and sustainable excellence for each Center.

— Faced with the already installed ability of the CTCL decision-making ecosystem for quantifying the results of scientific excellence, qualitative research allows for a deeper understanding of the processes at the base of the foundations of scientific excellence, for analyzing the interests, expectations, and needs of its major players, and for proposing scientifically informed guidance for public policy and centers.

## V. RECOMMENDATIONS FOR PUBLIC POLICIES

— Recommendations for Centers of Excellence

— Recommendations for Public Institutions

# I INTRODUCTION

According to the latest analysis of research organizations in Chile, there are currently more than 104 Centers of Excellence supported with public funding that produce scientific and technological knowledge in different areas of the natural sciences, social sciences, and technology (Ministerio de Ciencia, Tecnología, Conocimiento e Innovación 2020a). Recent studies show that ANID centers have positive economic and social profitability, thanks to the services and products based on R&D that they can offer in areas such as education, communication, and the productive sector (Álvarez et al, 2019; Guimón, 2013). Whether curiosity-driven or challenge-driven, these organizations are projected to be a necessary resource for mobilizing, generating and establishing networked economies in the coming years (Ministerio de Ciencia, Tecnología, Conocimiento e Innovación 2020a). In addition, as recent socio-political (Social uprising of 2019) and socio-environmental (COVID-19 pandemic) crises have taught us, these research organizations will be key to developing knowledge, skills, products and services in the face of future challenges (OECD, 2019, 2021).

From an operational point of view, Centers of Excellence are organizational structures aimed at producing knowledge, and guided by the notion of excellence, understood as the set of criteria and production standards necessary to generate high impact, innovative results in line with international scientific and technological research trends (Arthur, 2015; OECD, 2014; Ministerio de Ciencia, Tecnología, Conocimiento e Innovación, 2020b, 2020c). However, the

Centers do much more than just produce knowledge: in addition to experimentation, writing and publication of results, they must ensure the systematic training of advanced human capital, generate effective links with civil society and generate services and products that contribute to the development of the public and private sectors (Ministerio de Ciencia, Tecnología, Conocimiento e Innovación 2020a).

Accordingly, the National Plan for Centers of Excellence 2020 states that “the new institutional framework provides the opportunity to consolidate the centers through a commitment to excellence, valuing their diversity, recognition and openness to their evolution, strengthening multi- and interdisciplinary partnerships and reinforcing the link between them and with society” (Ministerio de Ciencia, Tecnología, Conocimiento e Innovación 2020a 3). Faced with this growing variety of activities and demands, how can we understand the notion of Excellence?

While management and funding instruments have been focused on the production of knowledge, the organizational dimension of the centers requires equal consideration, given its relevance in at least three aspects for their identity and scientific productivity. First, these are organizations with a high degree of internal variability, as they must integrate the diversity of disciplines, job positions and scientific cultures of those who participate in the Center. Second, considering the multiple tasks they must coordinate and accomplish from advanced research work, these organizations have the need to define and manage standards

of excellence for the different dimensions they must address. And third, given that these organizations are not isolated from the socio-cultural and material spaces in which they are located, local idiosyncrasies and social processes (e.g., the social uprising of October 18, 2019, COVID-19 pandemic between 2020 and 2022) may affect the way in which their members perceive their role in society, their disciplinary practices, their working conditions and their own situations of well-being and discomfort.

As is well known, to ensure institutional development and progress, every organization needs to manage its organizational identity not only to achieve its main goals but also to ensure the sustainability of its processes through the management of good practices and welfare conditions that safeguard the creativity (Stark, 2009), care (Elley-Brown & Pringle, 2021) and effective commitment (Thévenot, 2001) of its members. Faced with the relevance of the organizational dimension of Centers of Excellence, how can it be considered within the notion of Excellence itself?

In addition to the background already presented, the Anillo team was interested in understanding the implications on the notion of Excellence and in the organizational identity. Such notions were studied during the application of an instrument that was adapted and implemented, in an unprecedented and collaborative manner between the Anillo and the BNI teams at the latter institution: the Strong Participation (Del Valle, 2009). This instrument is an organizational strategy aimed at fostering innovation processes, cultural change, and the dynamic construction of institutional identity (Cádiz et al. 2021). It also made it possible to systematize, concretize and evaluate actions

as indicators of “institutional commitment” with the organizational changes needed by members of BNI to develop a research excellence culture (Cádiz et al. 2021, p. 9). Strong Participation, until this implementation at BNI, had not been applied in a Center of Scientific Excellence in Chile - making this experience the first of its kind.

The Strong Participation instrument was adapted and implemented at BNI by its Culture and Communications (hereinafter C&C) unit between 2019 and 2021, through three stages consisting of nine sequenced activities that managed to promote the participation of its members, generating a “robust connection with the local reality”, and gathering the “needs and skills of the members of the community” (Cádiz et al. 2021, p. 9).

While this collaboration allowed a first approach to the immediate organizational implications of its implementation, from which emanated general recommendations aimed at professionalizing, systematizing and strengthening the organizational structure of the Centers of Excellence (Cádiz et al. 2021, p. 10), a second approach was required to understand more fully the consequences that resulted from this pioneering experience in the country, analyzing its implications in a more comprehensive and medium-term manner.

At the same time, the C&C unit, from its purpose of promoting the center’s belonging, sense of community and organizational identity, was expectant regarding the consequences of the Strong Participation implementation, as well as of the other activities that took place during the same period:

### **BNI Transforms:**

*Series of workshops focused on teaching*



*skills and competencies complementary to the academic ones (communication skills, project writing, among others).*

### **Pizza Talk:**

*Periodic sessions where members of the BNI present their research advances, sharing the trajectory that led them to this proposal, as well as its social relevance. After the presentation and discussion, there was an informal space for sharing and eating pizza -which gives the activity its name.*

### **Neuromedicine Conversations:**

*Seminars where invited guests from outside BNI give presentations on their research related to neuroscience and its medical and clinical scope. It always starts with sharing a cup of coffee where participants have time to interact before starting the activity.*

### **Strong Participation:**

*Is an instrument for organizational development that, through three stages consisting of nine sequenced activities, allows systematizing, implementing, and evaluating actions to create, promote, and validate a multidimensional culture of excellence at research organizations. It was implemented between 2019 and 2021 with the participation of all BNI stratum.*

### **Cabildos:**

*Conversation sessions that took place after de Social Uprising in October 2019 and last until 2021. This was the only activity that was not organized by de C&C unit, it was born spontaneously in one of the BNI laboratories and then facilitated and supported by the C&C to get installed at the institutional level.*

It should be noted that Strong Participation and Cabildos had a similar format (group reflective dialogues) and, over time, their prioritized thematic content became similar

(personal and labor needs, interests, and expectations). The high similarity between Strong Participation and Cabildos activities could lead participants to be confused between both instances. However, such potential confusion does not affect the results of this study, since both instances were organized or facilitated by the C&C unit, thus being part of the activities considered for the analysis.

Thus, this report presents a qualitative analysis of the organizational practices and mechanisms that enable research centers to achieve excellence, which is part of a larger ethnographic research context conducted by the Anillo of Investigación en Ciencias Sociales Conicyt Pia SOC180039 team “Knowledge Production in Contemporary Chile: A Multidisciplinary Study of Science in The Making” (La Producción del Conocimiento en el Chile Contemporáneo: Un Estudio Multidisciplinario del Quehacer Científico).

The set of testimonies we gathered through focus groups on the perceptions, experiences, expectations, interests, needs and practices of their members was useful to understand the strengths and weaknesses of these kinds of institutions and, especially, to explore organizational instruments and strategies for the future design of these organizations.

In this sense, the report characterizes and analyzes those collective experiences that led to the reflection on the standard notions of scientific excellence in order to revisit them, this time, from a situated approach, affecting how each center understands, lives, embodies, practices, trains, works and disseminates its own excellence.

BNI represents an exemplary institution

within the STKI ecosystem for the pilot experience of the Strong Participation, as well as for the study of the implications of the complete set of activities organized by the C&C unit. On the one hand, this organization is funded by the best evaluated public instrument, both at the national and regional level (Scimago, 2022). In addition, it is a frontier research center oriented by curiosity, which stands out for its high scientific productivity. It also has an infrastructure that provides meeting spaces for the 17 university laboratories that comprise it.

Additionally, its curiosity orientation has not prevented it from exploring and investing in non-traditional areas of scientific work. On the contrary, BNI has promoted the areas of science education for diverse audiences, development of technology or technology-based services for industry, scientific communication, development of advanced human capital and labor platforms for early-stage researchers (staff scientists), in initiatives such as the magazine “Papers for all” and Loligo.

This study begins by delving into the particularities of the notion of Excellence that has emerged in BNI’s non-managerial stratum, considering the diversification of scientific activities and the inclusion of the social and organizational dimension. Subsequently, it provides results on unanticipated goodness that its members attribute to participation in these activities. Then, it reports on the role of C&C activities in the implementation of the new notion of Excellence. Finally, this study makes available to professionals and decision-makers in science policy a series of recommendations to inform, strengthen and guide the current understanding of the organizational culture of knowledge-producing institutions, and to generate strategies that recognize institutionalized notions of Excellence which, in coherence, promote all and not only some

of its multiple activities.

Regarding the instrument of strong participation, this study identified how its implementation allowed a complex organization to build new identities, cultures, habits, common meanings, interests and challenges, which previously existed only at the level of individual laboratories. In this sense, this report is focused on the results of the qualitative analysis of implementation of the Strong Participation at BNI, delving into its organizational impact both on the scientific culture of the members and on institutional aspects.

In addition, this study showed that the activities allowed its members to begin to reflect on their organizational autonomy and how this impacts on their governance and organizational possibilities, on their research culture, and also on their scientific production —an aspect considered as an essential pillar to move towards a more dynamic, situated and sensitive work horizon of Excellence in the contexts of production and application of R&D-based products and services (OECD, 2014, 2021; Nuffield Council on Bioethics, 2014; The Royal Society, 2017) .

Faced with the research challenge of addressing the organizational activities and mechanisms of a research center from the “inside” (Espinosa-Cristia & Trujillo, 2022), the qualitative approach of this study proved to be relevant and effective, allowing us to understand how the organizational identity of the center emerges through the analysis of its members’ perceptions of who they were, are and want to become in and around the organization (Brown, 2022). In this sense, the qualitative approach provided us with the strategies and methodological tools to understand organizational processes in their multidimensionality and complexity and, from there, to extract useful lessons for the eventual evaluation and improvement of these public instruments for the promotion and development of knowledge in Chile.

The study analyzed the perceptions of BNI members regarding the activities of the C&C unit. To generate the data for this study, the participation of members from different stratum of the center was encouraged, to have perceptions that respond to the diversity of experiences, interests, expectations and needs of those who lived and worked within this organization.

Through the Focus Groups technique (developed through an online platform), 7 groups of 4 participants each were organized: master and doctoral students (1 group), postdoctoral fellows (2 groups), staff scientists (1 group), Lab managers (1 group) and assistant researchers (2 groups). The groups were assembled according to convenience sampling, and gender balance was sought among the participants of the same group or stratum.

It should be noted that the situation of confinement and high domestic workload (in the context of the COVID-19 pandemic)

surrounded the calling process for participants and may have affected the availability of community members to participate in the focus groups, both through the gender proportionality of each group, as well as the possibility of coordinating a second focus group for lab managers, staff scientists and graduate students.

Each meeting lasted between 90 and 120 minutes and had the ethical protection of the Ethics Committee of the Universidad Alberto Hurtado.

A single thematic script was applied to all stratum, which was defined in collaboration between the BNI and the Anillo teams and was generated from four relevant issues on the notion of Excellence:

1. Scientific career diversification and Excellence
2. Building and strengthening of networks
3. Motivation to participate in C&C activities
4. Other unanticipated goodness

### The groups of participants are described below:

Stratum	Focus 1	Focus 2	Total
Assistant researchers	2 women, 2 men 38 - 46 years old	4 men 45 - 46 years old	2 women, 6 men 38 - 46 years old
Lab managers	3 women, 1 man 31 - 50 years old		3 women, 1 man 31 - 50 years old
Staff scientists	1 woman, 3 men 38 - 43 years old		1 woman, 3 men 38 - 43 years old
Postdoctoral fellows	3 women, 1 man 35 - 38 years old	2 women and 2 men 33 - 41 years old	5 women, 3 men 33 - 41 years old
Graduate students (Master's and PhD)	1 woman, 3 men 29 - 32 years old		1 woman, 3 men 29 - 32 years old
			28 participants
		Total:	12 women, 16 men 29 - 50 years old

For data analysis, an inductive reasoning strategy was applied, which allowed the construction of categories of interest, according to the criteria established by grounded theory (Glaser & Strauss, 1967).

The dialogues produced in each Focus Group were transcribed by members of the Anillo team, and then entered into the qualitative data analysis software Nvivo v12 for processing and visualization. From the above qualitative analysis, it was possible to identify and codify emerging categories, which informed the data analysis meetings between the Anillo and the BNI team, allowing the notion of Excellence to be characterized from a situated approach, as well as to identify the consequences and usefulness of the activities for the BNI community, specifying the effects of the C&C activities on Excellence at the institutional level.

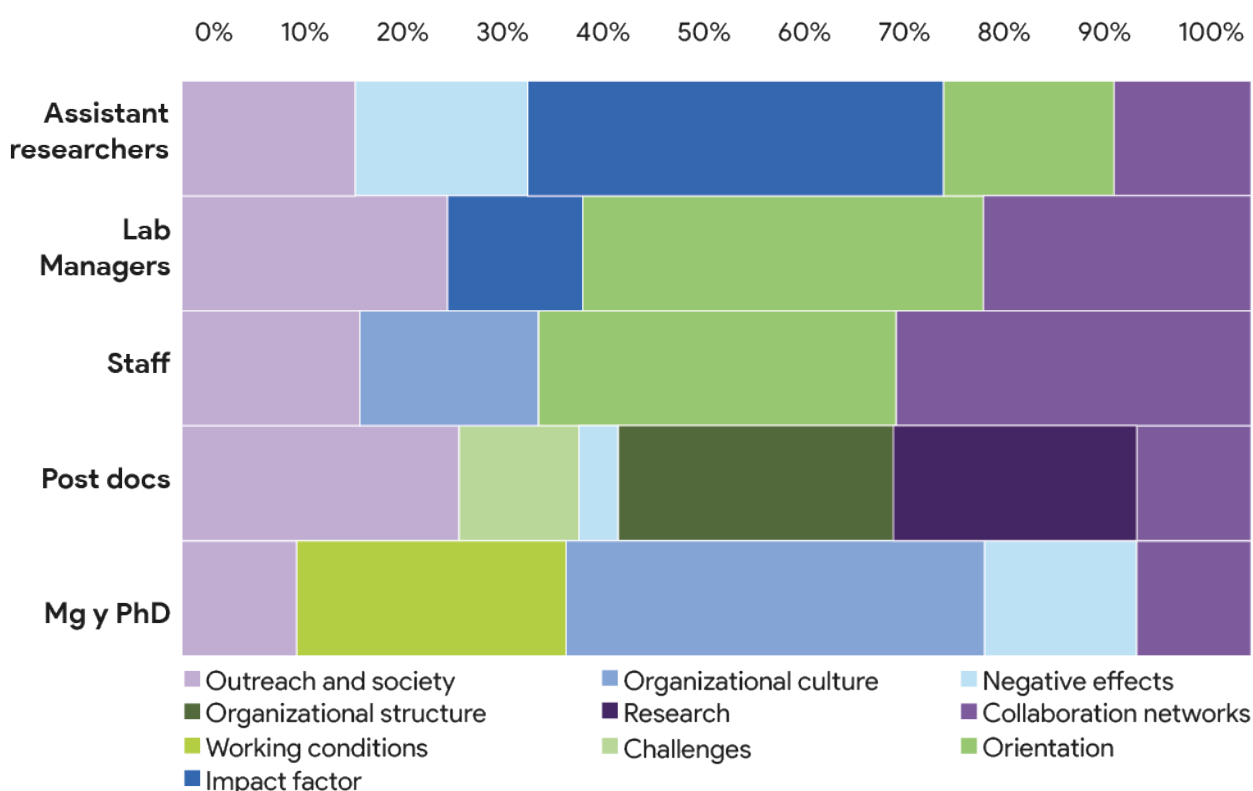


## 1. What did we find when we ask about Excellence?

When we asked the groups of participants what aspects of the life in a center are related to Excellence, we heard that there are several aspects that are considered with equal relevance to the quality of research and the impact factor, as part of the standard view on Excellence (Figure 1):

1. Outreach and engagement with society
2. Organizational culture
3. Orientation of scientific projects and careers
4. Organizational structure
5. Working conditions
6. Internal and external collaboration networks

**Figure 1.** Stacked bar chart relating stratum (X-axis) and dimensions of Excellence (Y-axis).



Source: Own elaboration based on the codebook assisted by the Nvivo12 program.<sup>1</sup>

<sup>1</sup> It is important to consider that the percentages indicated in Chart 1 are proportional to the coding of responses in each category and not absolute percentages that refer the occurrence of the cases.



When comparing the topics among the consulted stratum, we observed that there are cross-sectional and also particular elements, to each group. For all the participants, collaboration networks, the link with society and the negative effects they experience when trying to carry out this diversity of aspects were relevant. In particular, for the more consolidated stratum, the predominant topics are the disciplinary orientation of the scientific work and the impact factor, while for those who are beginning their scientific career, the structural and cultural aspects of the organization are key, because they enable

them to carry out research and outreach. In an intermediate level of the stratum herein shown, the group of postdoctoral fellows is found, for whom the most relevant aspect is the quality of the research carried out in the laboratories rather than the internationally recognized indexes.

The different aspects of Excellence will be addressed in depth in the following sections, which we have organized around two central qualities that emerged from the participants themselves: Multidimensional Excellence and Sustainable Excellence.

## 1.1. Multidimensional Excellence

Multidimensional Excellence involves, in addition to standard scientific practices (experimentation and publication of results), a repertoire of activities that already exist in Centers of Excellence but which, until now, have not been considered with the relevance presented here. Thus, the groups of participants revealed 8 aspects as part of the multidimensionality of Excellence:

- a. *Standard aspects*
- b. *Mutual recognition*
- c. *Interconnecting network and collaborative work*
- d. *Outreach, counseling, and professionalized management*
- e. *Clear and common horizon*
- f. *Excellence for all*
- g. *Social referents and outreach*

### a. Standard aspects

For all participants, the impact factor of publications continues to be a relevant aspect in defining the level of scientific

excellence of a center. However, the group of assistant researchers problematizes a negative effect of the high weighting of these elements in public funding instruments: it makes it seem that having many high-impact publications is equivalent to doing good science, and that doing good science is equivalent to having many high-impact publications, when this is not the case. On the other hand, for lab managers, staff scientists, postdoctoral fellows and graduate students, the quality of the projects carried out by the principal investigators is relevant, since it influences the decision to join a particular laboratory and, consequently, the center to which the researcher belongs.

### b. Mutual recognition

The first innovative aspect that we found corresponds to cultivating knowledge among those who cohabit the same center. That is, in addition to learning what the research of peers consists of, it is also

important getting to know each other “as people”. Due to the high physical dispersion among the laboratories and buildings that make up the Center, mutual recognition does not occur spontaneously. For this reason, participants recognized this as a dimension that should be actively promoted by the center, through organizational strategies. The relevance of this humane treatment is identified especially in younger segments:

***“...more personal environments, conversations, spaces for generating bonds [...] that generate a more human space [...] If I were to visit a Center of Excellence, I would pay attention to those details [...] the humane treatment <sup>2</sup> [...].”***  
(Focus group of graduate students).

This aspect extends to the expository activities - such as seminars - were the participants emphasized the need for the speaker to share their work in the format of process rather than final results, in simple language that is understandable to all, regardless of their area of expertise. This would make it possible to achieve generalized knowledge of the research topics, through the explanation of the research problem and know-how of each research area and researcher that make up the center.

### **c. Interconnecting network and collaborative work**

Expanding the view of Excellence beyond

individual experiences, this aspect emphasizes the generation and utilization of collaborative networks. On the one hand, the relationships between the research lines of the different laboratories stand out, indicating that they allow the transfer of tacit knowledge and the combination of strengths to promote collaborative creativity. On the other hand, they point out that intra-center collaboration networks allow the loan of technical equipment (e.g., microscopes) from one laboratory to another -for example, to improve the quality of their own research- and the exchange of practical advice from more experienced members to younger ones, allowing better decisions on how to generate, process, narrate and divulge the results of experiments:

***“[...] I would talk to a person and do it through the BNI. When he asked for help with certain methodology or collaborations, using equipment. It was because there was the BNI behind us. There was a network[...].”***  
(Focus group of graduate students)

In addition, it is considered of excellence to have inter-center networks, both national and international. These not only include occasional encounters (e.g. meetings, seminars or congresses), but also, and above all, the management of permanent connections for technical, scientific or thematic collaboration - contacts that need to be generated and managed through the Center’s permanent organizational strategies.

In the view of the participants, when internal and external networks are consolidated, the

<sup>2</sup> All quotations included in the Results section were translated into English from their original language, which was Spanish.

probability of becoming involved in projects that can be published in high impact journals and generating frontier science increases.

#### d. Outreach, counseling, and professionalized management

It is interesting that for the participating groups, Excellence is not only a scale of quality with which to measure the goodness of scientific work, but also manifests itself in the opportunity to learn skills to perform with excellence, e.g., teaching the writing of articles, research projects and even scientific communication, as was the case of the practice of the ‘Scientific Elevator Pitch’, within the workshops: “... it was an exercise that one does not do very often, to say what you do in 3 minutes or less. It was a tremendous challenge” (Focus group of graduate students).

In this sense, excellence is also manifested in the processes, requiring agents who are professionally dedicated to the logistics of laboratories, coordination, and management of research projects:

*“[...] it would have been very good [...] job positions that in essence were connectors, because a Pizza Talk or a meeting point where the two substrates meet is not enough... the catalyst was missing... at the level of project development, I see*

*that it would have been good to have a scientific manager [...] that is a person who is above the institute and looks at all the projects that are available, the lines of research of each laboratory, and begins to search, to build links between different laboratories [...] it generates new ideas and new projects, and strengthens in the end two lines that are separate.”*

(Focus group of staff scientists)

For stratum in more initial stages of a research career (students and postdoctoral fellows), there is also a need for professional guidance to explore and plan the career path of their scientific careers<sup>3</sup>, as well as to have an agent who knows the qualities, conditions and potential of the different projects for which it is possible to apply, and who can provide strategic recommendations to the members of the Center to be part of these, both individually and associatively with members of other stratum and even laboratories.

#### e. Clear and common horizon

Until now, the aspects mentioned refer to research work and daily life at the interpersonal level. In contrast, this aspect makes a difference, because it emphasizes an area that is born from the Center as an organization: it is of excellence to know who we are, where we are going, and then

<sup>3</sup> By scientific careers we refer to the career path in which people trained in science can work professionally, beyond the usual focus on experimentation and publication. These activities include science communication, university teaching, education and work with teachers, innovation and development, public policy, management and direction of research centers and universities, entrepreneurship, industry, among others.

what is expected of each member within the general panorama. Thus, not only does a center's management need to identify and define a clear mission, purposes, values and strategies that distinguish it from other organizations — as a seal— but also to be able to communicate with the rest of the members in a clear and timely manner, so that each member is able to differentiate their role and align their aspirations with the relevance of this organization.

#### f. Excellence for all

When talking about Centers of Excellence, the participants from different stratum agree that a center not only has to look like one, but also to be one. That is to say, if different stratum and roles are involved, the scientific work of excellence must be pursued and made visible at all levels, so that the centers are not known by one or two people at the highest levels —under a model of personalized excellence— but by the different groups and initiatives that are part of it.

This aspect also involves the principle of using the skills and abilities that each member has and has learned at the disposal of others: “in the words of Adela Cortina, excellence is only excellence when it is placed at the disposal of others” (Focus group of staff scientists).

#### g. Social referents and outreach

Finally, and moving away from the view that promoted the isolation of the scientist with respect to society, from students to

associate researchers agree that their roles are not complete if they do not generate an impact on society, assuming the duty to communicate their results in an accessible and responsible way. This implies that scientific knowledge can not only be reflected in a scientific journal, which is inaccessible to the general public and written in a language that is not very friendly to them, but that new discoveries must be made accessible to all and easy to understand.

In this context, being a center of excellence involves more than just producing knowledge of excellence. Equally important, being a center of excellence involves being a referent to be consulted in its areas of specialization for public policy decision-making:

***“We are approaching a standard [...] of a good institute that appears in the media, that has a presence, an importance in the education of the country. From teachers of students, who care about the people within the place.”***

***(Focus group of assistant researchers)***

In addition, for a significant number of participants, this goes hand in hand with the need to become involved in a broader social context and promote a vision of the country from their role as citizens. This is exemplified by an experience that led to the development of proposals aimed at the Constitutional Convention <sup>4</sup> that took place during 2021 and 2022 in Chile:

<sup>4</sup> The Constitutional Convention (Spanish: *Convención Constitucional*) was the constituent body of the Republic of Chile in charge of drafting a new Political Constitution of the Republic after the approval of the national plebiscite held in October 2020.

*“ [...]they are citizens and scientists, who are concerned about the vision of the country and the vision of the management of a country around science and many other things [...] if I had not participated in the cabildos that were organized, something like this, I would never have participated in something like this because I believe that this is the first time that something like this has taken place in my scientific experience [...] this is a more social, a more cultural spin-off of my participation in BNI [...] it is a contribution to the scientific community or to a vision of the country that may or may not be adopted, but I believe that one of the high points of this is the participation in BNI.”*

*(Focus group of staff scientists)*

Now, the citizen role is not limited to dialogue with decision-makers, but also includes experiences of direct contact with citizens through institutional initiatives focused on different target audiences (for example, the “Transforming Minds” teacher training workshop, and the organization of visits by groups of school students to the Center’s “Open Laboratories”).

The aspects described in this section reveal an internal reality of current research organizations, namely, that the members who inhabit and shape these organizations understand the notion of Excellence as a multidimensional demand or task. In fact, in contrast to the standard notion of Excellence, mutual recognition, interconnection networks and collaborative work, outreach, personalized guidance and management, common and clear horizon, excellence for all and being social and outreach referents are aspects that emerge as novel dimensions, because they show that the scientific communities in Chile agree on the need for the centers not only to train and receive people prepared for standard excellence, but also to take care structurally and organizationally of providing their members with the enabling conditions to achieve the Multidimensional Excellence that we have described in this section.

## 1.2. Sustainable Excellence

When the participants were asked about what aspects and practices they expected to find in a research center of excellence, they spontaneously emphasized a second theme that, especially for the most recent generations, is just as important as

multidimensionality: Sustainable Excellence. This implies “a much more comprehensive vision than just the hard academic career or the career of scientific productivity” (Postdoc), since it is related to the welfare of the people who not only work, but also



inhabit and live together in a center.

While multidimensionality refers to the need to diversify the activities and roles of the center before society and the international and national scientific community, sustainability refers to a center that “shares efforts and rewards” (Focus Group of postdoctoral fellows) among its members. In this sense, Sustainability emerges as a complement to multidimensionality, to the extent that it aims at providing the necessary conditions and skills to successfully face the high-quality standards of scientific work that a center of excellence demands, while harmonizing the demands of scientific work with personal life.

Thus, the groups of participants highlighted 3 aspects as part of the sustainability of Excellence:

- a. An organization that gives support and cares about its members.*
- b. An organization that gives comprehensive training to its members.*
- c. An organization that gives recognition to its members.*

**a. An organization that gives support and cares about its members**

Sustainability is an aspect that participants expect to be manifested in support, both at the individual and institutional level. At the individual level, they appreciate the fellowship and help in scientific work, from more experienced researchers to newer ones. At the institutional level, they value an organization that offers growth for all or, in the words of its members,

tiraje <sup>5</sup> (upward mobility). This implies that people who enter the center as undergraduate or graduate students, technical personnel or members can progress to higher hierarchical positions, with greater responsibilities or to higher stratum of scientific careers.

Younger participants especially emphasized that the lack of certainty regarding the “next step” in their career path negatively influences their current scientific productivity. This is due to the high probability that when they finish their graduate thesis or research project, they will be without funding for several months —until they are included in a new project.

This causes them a high level of discomfort, which intensifies as they approach the final period of their current work, making it difficult for them to focus on their current labor. Faced with the uncertainty of the “next step” in the career path, the participants value the possibility of having some space dedicated to timely guidance in scientific career planning (individual counseling), since this could provide greater security and eventual continuity to their career, beyond the current material resources or the life period of a center.

On the other hand, although it is commonly held that work and family conditions are a separate issue from scientific work, most of the participants recognized that these are inevitable and fundamental conditions for the effective carrying out of a high-quality work. This expectation is based on their own experiences in universities of recognized international prestige. Regarding working conditions, the participants pointed out that these translate into formalizing and institutionalizing the protection and care

<sup>5</sup> Spanish word for naming the upward movement of smoke through a chimney flue.

of those who perform scientific work, for example, through employment contracts. Regarding family conditions, participants emphasized the need for the center to provide welfare care mechanisms for their family groups:

***“I look at the working conditions in that place. See [...] if it allows me to travel with [...] family [...]. I believe that the center of excellence is not only from an academic point of view, of professional training, but that it allows me to live comfortably, especially if I go to a country where the culture is completely different”***  
(Focus group of Postgraduate)

In the same way, an aspect of particular importance for the participants is to incorporate a gender perspective in daily scientific practices. Far from being limited to a matter of numerical gender matching among those who are hired and form part of the organization, the participants highlight measures that have a transversally positive impact on different aspects related to the generation of knowledge, such as access to childcare for mothers and fathers alike, and protocols for reporting workplace harassment.

Through all these issues, the participants aim for an institution that builds a more humane work environment where people feel comfortable, where hierarchy and competitiveness are balanced, and where collaboration and fellowship prevail in every

workspace and for all strata. Of particular interest is the fact that the relevance of this aspect comes from both negative research experiences, like resigning from projects of high scientific quality due to high levels of hostility and internal competition, and positive research experiences, particularly in research centers of international prestige where this issue is treated seriously and systematically by the institution.

#### **b. An organization that gives comprehensive training to its members**

An essential condition for sustainable excellence is the relationship of circularity and reciprocity between the center and its members. On the one hand, the center teaches integral skills to scientists, and, on the other hand, this training enables them to achieve the results of excellence expected by the organization itself.

The comprehensive training aims at the diversity of areas, including competencies for both standard and novel aspects of multidimensional scientific activity: use of technical equipment, application, management and writing of projects, design and writing of scientific articles, skills for communication and outreach in different media, education for different audiences, technological innovation, management, among others.

#### **c. An organization that gives recognition to its members**

Participating groups add one last aspect necessary for their present and future well-

being when engaging in novel activities for scientific work: recognition.

Although outreach, education, and innovation activities, among others, are not contemplated within the formal requirements of their studies or individual projects (master's/doctoral thesis, postdoctoral/Fondecyt project, among others), the participants problematize that the performance of these activities improves the quality indicators by which the center is measured, without perceiving any significant reward in their individual scientific careers. This places them in a contradictory position: while they perform these activities with commitment and personal satisfaction, they do not receive any recognition for doing them. In contrast, both at the work and cultural levels, they are penalized for having dedicated time and energy to activities other than what is typically understood as *doing science*.

*“by reward I do not mean economic; for me, having participated in many of these activities, to some*

*extent I feel that I wasted my time, not because I feel that I wasted it, but when I present my resume somewhere, those are hours that I spent that I did not publish, and in the end that is the only thing that matters, that I did not publish them.”*

*(Focus group of postdoctoral fellows)*

Thus, the participants emphasized the need to establish institutional mechanisms for informal and formal recognition, involving validation of these activities by their peers and hierarchical superiors (for example, incorporating a space in the lab meetings to talk about these other activities, where more members of the laboratories are encouraged to participate), and allowing them to be incorporated in their curriculum vitae, translating into an added value when applying for new jobs, positions or competitive funds.

## 2. What did we find when asking about the consequences of the activities carried out by the Culture and Communications unit at the BNI?

When the groups were asked about the positive consequences of participating in the activities of the Culture and Communications (C&C) unit, they pointed out a wide range of

goodness and institutional changes, which went far beyond what we anticipated as a research team and as the heads of the C&C unit of BNI.

## 2.1. Goodness of Participation

The different groups that form BNI reported on their participation in the activities of the C&C unit. This participation had multiple goodness, beyond those anticipated by the group organizing these events. In particular, the following are highlighted:

- a. *Gathering so that the center is perceived by its members.*
- b. *Knowing each other despite physical dispersion.*
- c. *Getting fresh air in the daily routine.*
- d. *Sharing workplace issues.*
- e. *Giving space for and satisfying scientific curiosity.*
- f. *Mapping thematic and technical expertise.*
- g. *Spontaneously collaborating when gathering.*

It is important to mention that this goodness was not experienced as a result of participating in large consecutive accumulations of sessions, instead they were enjoyed in the attendance of each session and could have a cumulative and increasing effect by attending more sessions over time. We will go deeper into each of these aspects in the passages of this section.

### a. Gathering so that the center is perceived as existing as such

Research centers are spaces where the collaboration of highly specialized agents is promoted. This quality demands organizational practices that encourage interaction among members who do not usually have daily contact, particularly in centers of high physical dispersion.

In this context, it was a striking result that the members not only appreciated these instances for their potential to create research networks, but also as moments in which the center appears:

***“The BNI Transforms, Pizza Talk, they generated like a greater sense of community / Yes, of belonging.”***  
(Focus group of postdoctoral fellows)

Thus, while most of their daily activities, such as experimentation and meetings with colleagues of the same laboratory, are framed within the existence of the laboratories to which each one belongs, it is in the participation of these C&C activities where the members declare that they perceive and live the experience of belonging not only to a laboratory, but to a center.

### b. Meeting each other despite physical dispersion

Considering the high physical dispersion among the laboratories and buildings inhabited by members of the BNI community—a quality that is usually present in research centers—these activities also served as a support to meet other professionals. Just the awarding and implementation of a center does not ensure the cooperation and strengthening of links between its members—especially between members belonging to different laboratories— but it depends on the generation of initiatives such as the

C&C activities. This is how one Lab manager relates his experience:

*“I think that the first focus group of ‘lab managers’ was the first time we all got to know each other. I know Giuseppe who is next door, I have seen him a little more. But I didn’t know her [referring to another focus group participant], for example. The first time we all got together [...] was in the focus groups. In fact, I met a university classmate who I had no idea that worked at BNI [...] that’s how disconnected we were.”*  
(Focus group of lab managers)

of these moments where they could get out of the routine, eat something special, and receive support from their colleagues:

*“[a participant is talking about the meeting experiences prior to and after the main activities] ... ‘It is even therapeutic, [...] the 10 minutes before entering the instance, is a catharsis, there everyone is encouraged by each other, ‘don’t worry, I’m in the same situation’, then, beyond the scientific collaboration itself, there is a catharsis there together and I believe that this is a great value of the instances.’”*  
(Focus group of postdoctoral fellows)

#### c. Getting some fresh air in the daily routine

Although most of the C&C activities had a purpose related to scientific work - disseminating research findings, learning techniques and methods from other laboratories, learning a scientific communication skill, among others - participants from all levels agreed that a large part of their motivation for attending was not the activities themselves, but what happened before or after the activities.

Thus, in the presence of a pizza, a soda or a coffee, and without prior planning, the participants emphasized the positive effect

#### d. Sharing workplace issues

The activities aimed at promoting excellence also made it possible to share collective realities and problems, which until then had been seen as individual, with no connection to others.

At the same time, these activities allowed the center’s board of directors to become aware of these problems and to propose alternatives to find a solution. A concrete example given by the interviewees is related to the inequality in the allocation of academic hierarchies (belonging to the Staff scientist or not) and the situation of informality in which many researchers find themselves, anticipating an uncertain future



in their scientific careers:

*“[...] the focus groups and the Cabildos were the culmination of this, where the people were able to reveal the deficiencies in the areas of salaries, why laboratories paid different salaries, the goodness or lack of goodness that the people who worked as research assistants had. Everything that started to come up in the Cabildos, it is clear that it was already there, but at that moment it was channeled because people started looking at each other and said, “It’s not just me anymore”*

*(Focus group of staff scientists)*

#### e. Giving space for and satisfying scientific curiosity

When we think of centers of excellence, we imagine highly specialized people who are only dedicated to their own experimental projects. But the reality is that they are still scientists, i.e., they all emphasized that they have an attitude of curiosity that motivates them to discover or learn about new topics, problems, objects, and experimental techniques, which is not satisfied by doing only what they are already experts in.

Thus, the participants highly value having instances to learn about other research outside their disciplinary field or expertise:

*“As far as I am concerned, participating in these seminars are the times when one can learn about the research that other people do [...] in addition to that, I like to participate in order to learn, whether I can go is another thing, but if I can go, I always find it interesting”*

*(Focus group of assistant researchers)*

#### f. Mapping thematic and technical expertise

Participants indicated that another benefit of participating in these activities is to generate a map of expertise by learning, activity after activity, which peers are good in which disciplines, fields, topics, research objects, methods/models, or even specific techniques for experimentation.

This is particularly relevant for researchers belonging to the younger segments, since it allows them to generate a network to plan collaborative projects strategically and in advance:

*“I believe that I don’t need to know everything, but I need to know who knows, right? I mean, I may not know how to do something, but if*

*I know Gabriel we can do things together, because I, again, because conceptually we can work together and then each one contributes from his technical expertise, so that is something that represents me very well, so going to something where I do not understand every detail, of course, sometimes I get bored, obviously, but having the idea that it exists and that it could be done, for me is very valuable, I feel that it increased my personal capital.”*  
(Focus group of staff scientists)

guidance on various topics; doubts or problems they had while carrying out their experimental work, writing articles, sharing data and equipment from other laboratories, or for any other activity related to scientific careers.

*“[...] Sometimes you would talk to a person and do it through the BNI. When I asked for help with certain methodology or collaborations, using equipment. It was because there was the BNI behind us. There was a network. And you might not be as aware that that network allowed you to do that.”*

(Focus group of graduate students)

#### **g. Spontaneously collaborating when gathering**

As the final aspect, the spontaneous contact with colleagues and experts that was generated during each of the sessions opened the possibility to ask for help or

Despite the low valuation usually attributed to these aspects, this finding shows the relevance and centrality that the social dimension occupies within scientific work, acting as an agent that drives much of the life within a center of Excellence.

## **2. 2 Implementation of Multidimensional and Sustainable Excellence**

As the final result of the implementation of the C&C activities, we found that they allowed to formalize the elements of multidimensional and sustainable Excellence, in a process of three dimensions occurring in parallel.

These three dimensions are:

- a.** Socialize elements of multidimensional and sustainable Excellence.
- b.** Institutionalize elements of multidimensional and sustainable Excellence.
- c.** Constructing BNI organizational identity

### a. Socialize elements of multidimensional and sustainable Excellence

Although the concept of Excellence is part of the daily vocabulary of the centers — linked to the definition of Excellence of the National Policy of Centers (2020c)— aspects such as the promotion of innovation and technological development, participation in educational matters or labor welfare conditions, are not equally evident to all of their members.

In this regard, some BNI members stated that the C&C activities allowed them to learn about aspects of Excellence that they had not taken into consideration. For example, the BNI Transforms workshops allowed researchers to incorporate “the idea of the scientist who makes innovations” (Postgraduate) as part of the potential of their professional projection. The Cabildos, an activity channeled by the area, facilitated the conversation and exchange of experiences among colleagues, valuing the collective recognition of a feeling of “discomfort” underlying the center’s working conditions. Participants also noted this effect in other activities organized by BNI’s Education area, such as the “open laboratories”, where school students were invited to visit the laboratories and learn about the work of scientists.

These examples show how different activities promoted the socialization of multidimensionality by showing them other possible avenues for career development, including working with educational institutions —and sustainability— by highlighting the importance of the C&C unit.

### b. Institutionalize elements of Multidimensional and Sustainable Excellence

The institutionalization of the elements of multidimensional and sustainable excellence has been a highly valuable finding for this study. While the prior finding refers to a change at the individual level, this second finding refers to a change at the organizational level, highlighting the need that, for the experiences associated with multidimensional and sustainable excellence to permeate the diversity of practices of all levels of an organization, in a sustained and lasting way, the organization must build specific and professionalized spaces that incorporate this way of approaching excellence in its own organizational structure and infrastructure. Even though this change was not planned by the C&C unit, participants emphasized that this organizational level had a major impact on their day-to-day experiences at BNI. In particular, the newer stratum perceived that the execution of the area’s activities implemented the various areas of Excellence that they had learned in centers abroad:

***“[...] therefore, much of the desire or impetus that one had to have collaborations, to have other types of conversations, to be able to foster other types of skills, the BNI also gave them, or generated a protected space for them.”***

***(Focus group of postdoctoral fellows)***

The institutionalization of activities not only generated protected spaces, but also, through the strategies used to disseminate them to the BNI community, encouraged and facilitated attendance by already interested young members. That is, the formal calls sent out by the C&C unit through mailing lists and posters, with the implicit support of the Board of Directors, caused the leaders of the laboratories to increase their tendency to encourage the participation of the members of their units.

This example shows that, in order to achieve the generalization of multidimensional and sustainable excellence in a center, it is not enough just to socialize it among its members, but it is essential to incorporate it into the organizational structure of the center. It is this institutionalization that provides, in a fundamental and irreplaceable way, legitimacy and recognition to a group of activities, and makes them part of the organizational culture of an institution.

Also, only institutionalization generates the structural organizational conditions that make possible and encourage the participation and commitment of its members to the new activities and this new culture.

### c. Constructing BNI organizational identity

The last finding was that some BNI members associated multidimensional and sustainable Excellence with a BNI seal, as a feature that has been imprinted in their identities and will accompany them in their future career paths:

*“I think the BNI seal is going to be that, I think the BNI seal is going to be these things, it is going to be that when someone says “hey, we have to do a paper” and everybody -or a center or a laboratory- and everybody thinks about how to do science, we are going to know how to do science and we are going to say “well, but we still have to look at other aspects”, like the people who come, how many hours they work, if they have children or not, how we help them, how we support them, I feel that this is going to be our seal, like having a more comprehensive perspective.”*

*(Focus group of staff scientists)*

As we have shown, these factors go beyond scientific experimentation itself and emphasize the material, institutional, labor, and human conditions that make it possible. The organizational case of BNI and the implementation of C&C activities, shows how each center tends to question and generate its own seal, an organizational identity that allows them to distinguish themselves from others, beyond their experimental work. In this case, BNI has found a participatory way to initiate the transition to multidimensionality and sustainability of Excellence.

## IV CONCLUSIONS

This report analyzes the members' perceptions of the BNI regarding the concept of scientific excellence and activities implemented by the Culture and Communications unit. This area is unprecedented in Chilean centers of excellence and its objective was to foster belonging, a sense of community, and organizational identity of the center. Our analysis shows that the C&C activities, part of them implemented and contextualized by the social uprising on October 18th, 2019, and the COVID-19 pandemic, allowed members to identify the diversification of excellence and to value well-being as central axes for their excellence conceptualization. Furthermore, some focus group participants expressed that C&C's activities and interventions contributed with the emergence and the portrait of a "BNI seal".

Delving into the perceptions of the notion of Excellence that has come to life through the different BNI stratum, allows us to identify and define two understandings of Excellence. Both perceptions of the notion of excellence involve complementary elements that are valued by the members as enabling and necessary conditions for excellent research, both from the standard scientific point of view and from the personal, work and social points of view.

For **Multidimensional Excellence**, they described components such as: generating humane treatment and recognition; collaborative networks for the transfer and learning of tacit knowledge and equipment; professionalization of a center; clarity of the center's vision and job projection options; and being a social referent. For BNI

members, all these aspects are central to the excellence of a research center.

For **Sustainable Excellence**, they explained that the guiding principle is the wellbeing of the people and the community that inhabit and live together in a center. Sustainable excellence requires an organization that supports and cares for its members, both in their professional and personal development. In this sense, the participants value the C&C training spaces to become integral professionals and agree on the need to formally and informally recognize the activities carried out.

The results of this study point to the fact that robust scientific excellence demands multidimensional and sustainable Excellence. This is to say, the successful performance of both standard activities (experimentation, writing and publication) and other areas that the policies and the STKI ecosystem demand from the centers (educational outreach, information for public policies, innovation in services and products in connection with the productive and private sectors, among others) require systematic and professionalized preparation in the various techniques and skills involved in each activity.

In this sense, a Center of Excellence consists of a center whose high scientific quality is demonstrated both in its scientific production and in its links with society, and which is the result of the comprehensive training and care that it systematically provides to its members, in accordance with the expectations, interests, and needs of the stratum in which they find themselves.



The participation of members in C&C activities led them to identify the diversification of activities and the valuation of well-being as aspects that became relevant in meeting the challenge of Excellence. Although members' participation responded to a gap in training for the successful performance of non-standard activities to respond to demands for social bonding, those that were in the focus groups stressed the need to request strategies at the institutional level that support wellbeing and life-work balance, plus members scientific careers guidance. Such demands emerge from the Strong Participation intervention and Cabildo sessions.

According to our expectations, the analysis shows that the C&C activities had implications in the medium term at the BNI. This study shed light on the need to include in the various STKI ecosystem instruments, the consideration of expanding and giving maneuvering space and diversity for each organizational community -its autonomy- as a required feature for each center, in different ways, to build an organizational culture that supports the institutionalization of multidimensional and sustainable excellence, for the achievement of scientific excellence.

The analysis of perceptions about the activities of the C&C unit also made it possible to identify a series of goodness not anticipated by the area or by the guiding instruments of public policies on STKI. In coherence with the first results regarding Excellence, it was found that the goodness was again structured from the relevance and centrality that the social dimension occupies within the scientific work, acting as a catalyzing agent of life within a Center of Excellence. The participants indicated that the meetings allowed the center

to emerge, to get to know each other despite the physical distance, to get out of the routine and receive the support of colleagues, to collectivize work problems and seek solutions, to satisfy the curiosity so characteristic of scientists and to map the expertise present in the organization for future collaborations. Finally, the C&C activities made it possible to facilitate spaces demanded by the Center's members and to institutionalize them, fostering the socialization and valuation of multidimensional and sustainable excellence, and constructing the BNI identity. The evidence collected in this study shows the need for research centers -and other national funding instruments- to comprehensively understand researchers as both subjects and workers:

- *At the individual level, understanding personal interactions and the collaborations that arise from them as an essential part of the scientific endeavor, making the necessary efforts to foster these meetings. This understanding should include addressing the possibilities of employment projection in the centers, in addition to considering the multiple activities carried out by members to transfer their knowledge to society.*
- *At the collective level, to ensure an organizational culture of well-being, which involves both the work and personal dimensions of researchers, with equal relevance.*

This study has shown that, to build the enabling conditions to develop the full potential of its members, a center requires professionalization in terms of governance and organization, through the implementation of an organizational infrastructure that includes hired

professionals dedicated to the strategic and planned approach of both levels, including, for example, the areas of welfare, culture, training, project coordination, among others. Finally, in the STKI decision-making ecosystem, in view of the already installed capacity STKI to quantify the results of scientific excellence (using determined impact indices and more generally quantifiable measures), this study demonstrated the relevance and importance of using qualitative methodologies to deepen the understanding of the processes at the basis of scientific excellence. In this case, its implementation allows the emergence of categories hitherto unpublished in the ecosystem of funding instruments for public policies in STKI in our country. These categories define and characterize the features that institutional practices oriented towards the scientific excellence of the centers must have if they are to respond to the current expectations and challenges posed by the national and international

ecosystem in STKI. This capacity to enter dialogue with the daily protagonists of these institutions and systematize the findings in a rigorous way makes qualitative methodologies an indispensable tool for STKI decision-makers to advance in the generation of evidence that informs public policies regarding the organizational effects of the implementation of the current funding instruments derived from public policies in STKI.

Qualitative methodologies enable a scientifically informed approach towards new phenomena and categories, which can drive processes of accommodation, modification, or proposal of new instruments and policies, advancing their responsiveness to the experiences, interests, expectations, and needs of those who have become experts by experience as they use and live the consequences of these instruments and policies in their day-to-day life: the research centers communities.

**It is recommended that Centers:**

- Carry out an inventory and subsequent socialization of the various activities that, from different fields (research, dissemination, education, etc.), comprise the Excellence for the members that make up the center.

This will make it possible to recognize the range of practices that can be professionally implemented and supported, in addition to allowing the internal evaluation of each center according to its own excellence standards and criteria, represented in each of the inventoried activities and areas.

- Create a space in the organizational structure of the centers, aimed at coordinating the scientific and technological professionalization and innovation between laboratories, while providing guidance to the work pathways of its members, focusing on those members who are starting their professional careers and who are only involved in research projects with limited duration.

This space can be made up of professionals hired for this mission, as well as researchers from different stages in their scientific careers who demonstrate special skills in these areas. The formalization of this role will allow researchers to be recognized, as it can be included in their resumes.

- Increase the participation of all the strata in the internal processes of the centers, in a continuous and systematic manner.

In this way, it will be possible to design the

multidimensional and sustainable excellence practices that the center will develop in its operation in a participatory manner. This will also foster the construction of a collective identity and a common organizational culture, in which each member experiences a link with their own needs and interests and is motivated to be part of activities beyond their knowledge generation activities.

**It is recommended that Public Institutions:**

- Institutionalize multidimensional and sustainable excellence in the call documents of the STKI system instruments for centers. This will encourage centers to create an organizational identity with greater diversity in the scientific profession, the incorporation of professionals —communicators, educators, among others— that facilitate and encourage this process, and the creation of mechanisms and strategies for care and support, especially for those members who are in positions or roles of higher vulnerability.

A key aspect for this purpose is the budgetary dimension; that is, that the budgetary framework structured in the call documents of the funding instruments for Centers gives space and encourages the incorporation of professionals dedicated to the multidimensionality and sustainability of the Center's excellence, whose work promotes the different strata and laboratories of the organization transversally.

- Create coordination and alignment instances of the different Instruments of the STKI System.

This will enable, recognize, and support the development of diverse scientific careers that contribute to satisfying the different (multidimensional) areas of scientific excellence in our country.

Establish minimum organizational design features in the call documents of public instruments, aimed at institutionalizing an area dedicated to:

1. The promotion and coordination of the multidimensionality of scientific practices, both within the institution and in its

relationship with external institutions and audiences (other research centers/projects, policy makers, schools, etc.);

2. The care and well-being of all the center's members, and

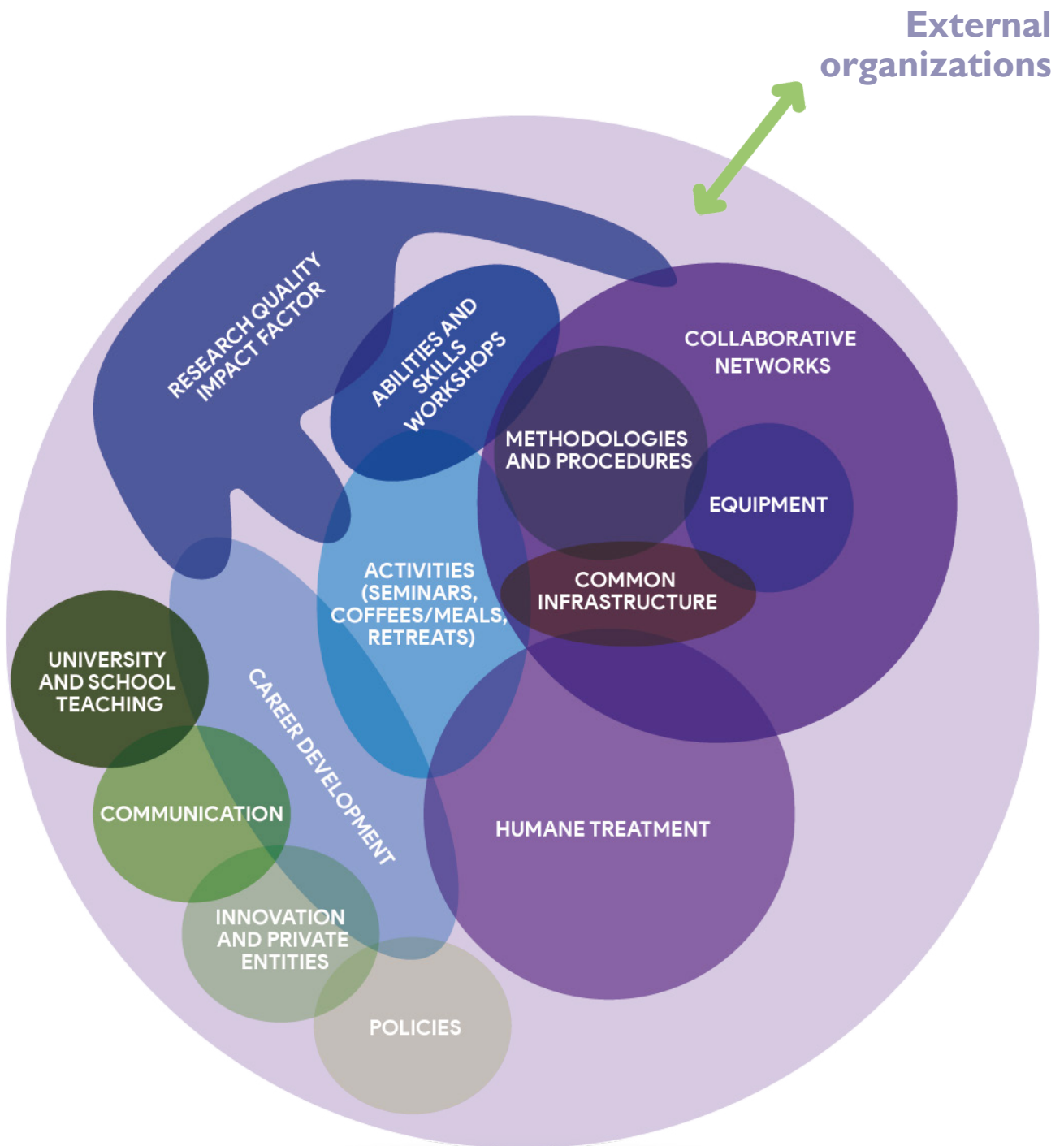
3. The construction of the center's identity and purpose.

The implementation of this suggestion will ensure the depiction of enabling material and social conditions in everyday organizational life, allowing for the creation of sustainable excellence in the generation of knowledge.



## DIAGRAM I:

### ECOSYSTEM FOR MULTIDIMENSIONAL EXCELLENCE

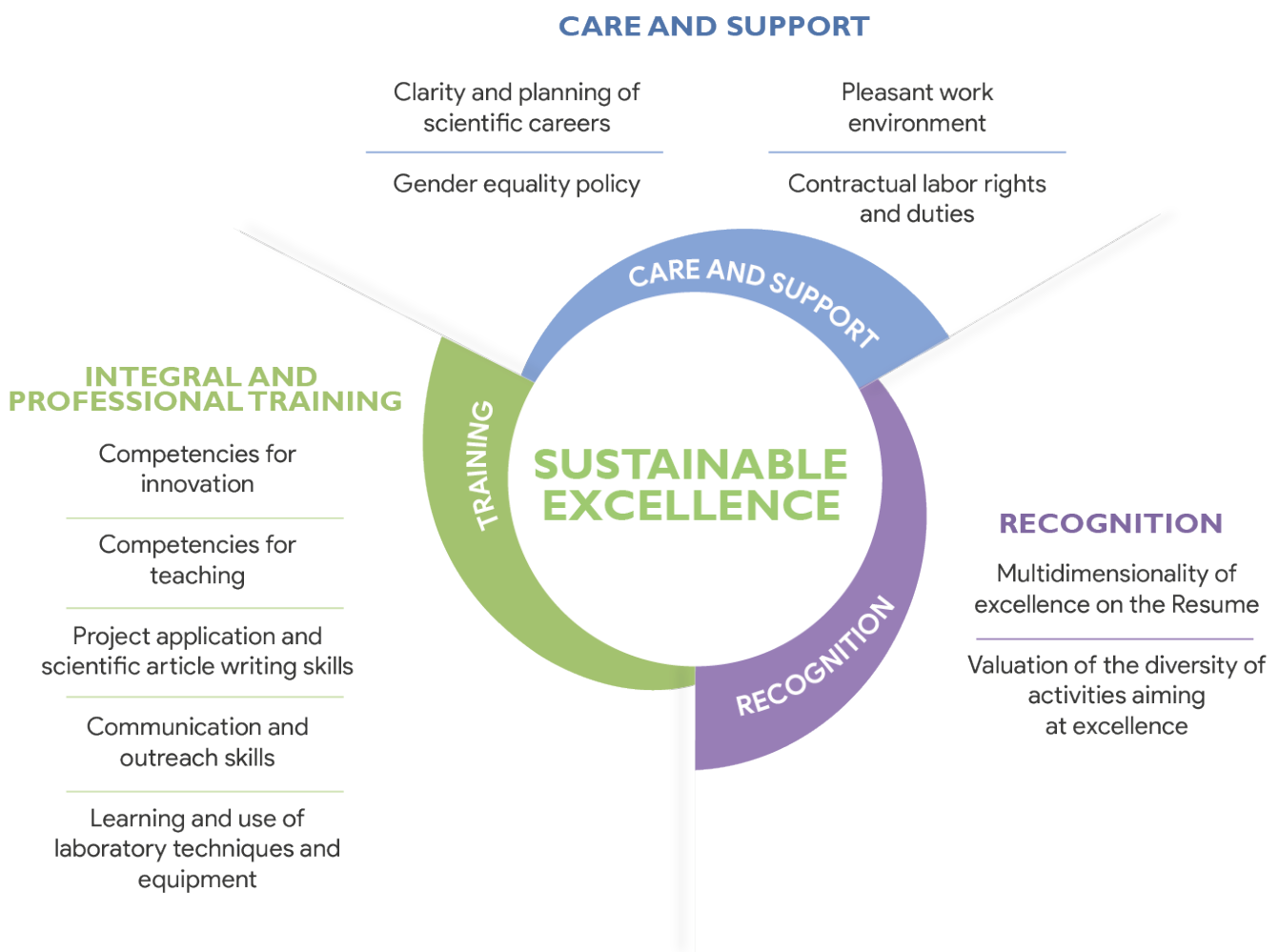


Source: own elaboration.



## DIAGRAM 2:

### SUSTAINABLE EXCELLENCE



Source: own elaboration.

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