Evaluation of ICREA Academia

FINAL REPORT
Evaluation of ICREA Academia

technopolis [group], January 2013

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Front page image: Tag cloud representing the answers to question 13 of the survey to ICREA Academia awardees: ‘Could you please briefly explain how ICREA Academia has allowed you to advance your career and/or contributed to any promotion/ prizes/ awards you have received?’ (Wordle).
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Executive Summary

Technopolis was commissioned to conduct an evaluation of the Academia Programme of the Institució Catalana de Recerca i Estudis Avançats (ICREA) to complement a previous evaluation of ICREA support for Senior Research Professors in 2010.

The evaluation sought to understand and assess the performance of the programme after four years of activity, in order to

• Confirm the quality of the professors selected by ICREA Academia
• Provide evidence to demonstrate ICREA Academia awardees’ contribution to strengthening the research system in Catalunya
• Identify opportunities to improve ICREA’s effectiveness

0.1 The ICREA Academia Model

ICREA was established in 2001 with the aim of strengthening the Catalan research system by bringing high-quality international researchers into the region. Its primary role was (and is) to recruit and fund international researchers and embed them in Catalan universities and research institutes. In 2008 its role was broadened to include the provision of fixed-term financial support for high-quality research-active university professors already based in the Catalan universities through the ICREA Academia programme. The support is intended to enable university professors (referred to as 'Academia Professors' or 'awardees') to intensify their research activity and, by doing so, ensure that existing talent is retained and developed in Catalunya.

ICREA Academia provides a five year fixed-term financial award of €50,000 to existing high-quality tenured university professors to enable them to decrease their teaching load and spend more time on research. The funding is split three ways: €20,000 to support increased research activities; €25,000 as a personal financial award for the academic researcher; and a €5,000 administration fee for the university. It is entirely at the discretion of the awardee as to how the €20,000 for research is allocated. In most cases it is used to hire replacement teaching staff to release time for research, hire research assistants to support the research process or to fund specific research activities directly. The programme is targeted at high quality university professors who are at an ‘active and expanding stage’ of their career and who have considerable potential to develop their research career further. Applications are made directly to ICREA by individual professors and selection is based on international peer review.

0.2 Context and Rationale for ICREA Academia

Increasing the quality of the public research system is a key aspect of the Catalan Government’s strategy to improve Catalunya’s innovation performance. ICREA was intended to overcome a number of recognised rigidities in the Catalan and Spanish research systems with the ICREA Academia Programme addressing particular institutional, legal and cultural factors of the Catalan university system that severely limit the quantity and quality of research undertaken.

Universities are key components in national and regional innovation systems as both educational and research organisations. Historically, Spanish universities have placed greater emphasis on education than research. This emphasis is embodied in employment contracts and in university resource allocation systems. As a result, the majority of academic time is assigned to teaching duties and there are few incentives to undertake research. Academic career progression and salaries are largely dependent on length of employment rather than individual performance meaning that existing or potential research ‘stars’ cannot be appropriately incentivised or rewarded in terms of resource allocation or salary.

Therefore the rationale for the ICREA Academia programme was a need to address the constraints in the Catalan university system that had led to low levels of research in Catalan universities and a
corresponding risk that high quality research-active university professors would move to countries and institutions more amenable to research careers. The objectives of the ICREA Academia Programme are to

• Incentivise research excellence and research intensification among university staff; and by doing so to stimulate change in the Catalan universities

• Retain high quality research-focused professors - particularly those at an active and expanding stage in their research careers who tend to be more mobile

The evaluation demonstrated that the rationale for ICREA Academia was, and is, valid, particularly with regard to the first objective. It meets a need in the higher education research system in that it enables existing tenured professors, who have already demonstrated their commitment to research, to intensify their research activities and further develop their research portfolio and reputation. The evaluation interviewees report that there is no other programme or policy that enables such an intensification of research on such a scale.

There was less strong evidence to support a rationale for the second objective. The professors supported by the Academia programme are fairly typical Catalan and Spanish academics who have returned to their ‘home’ region after several years abroad in their early career, hold tenured positions and are, as a result, relatively immobile. While they may be frustrated by the lack of support for research careers, in most cases this frustration is insufficient to cause them to seek alternative positions outside Catalunya or Spain.

The Academia model enables the selection of high quality professors through international peer review and its financial support addresses the practicalities of enabling academics to focus on research and, by leading by example, demonstrates that performance-based positions can be accommodated by Catalan universities. The financial model addresses two constraints in the university system: it provides funding to increase research activity by ‘buying-out’ teaching time and, via the salary supplement, puts a performance-based reward system into practice. The latter feature is supported by the peer-review based selection process.

0.3 Inputs and Activities

ICREA Academia is a popular programme. Over four annual calls (from 2008 to 2011) the programme received a total of 1,181 applications from 742 individual professors and 107 applicants have been selected for Academia support. This represents a success rate of 9% for all applications and 14% in terms of the individual applicants (as some professors have applied to the programme more than once). 60% of applicants applied more than once to the scheme, and while some applicants are successful after several attempts, the success rate reduces with multiple applications. Further, the number of awards made by ICREA is intentionally decreased each year to reflect the fact that the pool of the highest quality professors declines with each call.

The annual Academia budget depends on the number of awardees in place and has increased as each annual call is completed. The Academia budget in 2013, with 107 awards, was €5.3 million. This is significantly lower than the budget for ICREA Seniors where ICREA is fully responsible for salaries. The majority of the Academia Programme budget goes directly to awardees with running costs representing just 1.5% of the ICREA Academia Programme.

ICREA Academia awardees are hosted across all the seven public universities in Catalonia, with the majority (more than 60%) based in the region’s two largest universities, the University of Barcelona and the Autonomous University of Barcelona, followed by the University Pompeu Fabra with 18% of Academia Professors. These are the Catalan universities with the highest international reputations and also some of the best performing universities in Spain. This distribution largely reflects the distribution of the academic population among the region’s universities except for a higher proportion of Academia professors at University Pompeu Fabra. The distribution is also reasonably similar to the pattern for ICREA Seniors. Overall the number of Academia Professors supported represents less than 1% of the total academic population in Catalunya.

The Academia Professors are distributed across all five broad research disciplines with the largest proportion in Experimental Sciences and Mathematics (26%). All in all, science (Experimental Sciences and Mathematics, Technology and Engineering, Life and Medical Sciences) represents 64% of all ICREA Academia Professors while Social & Behavioural Sciences and Humanities
account for 36%. This distribution is broadly similar to that for the ICREA Seniors (as in 2010) except for a higher proportion of Seniors in the life and medical sciences. This difference is largely attributable to the large number of ICREA Seniors in the life and medical sciences hosted by research centres (rather than universities).

In terms of nationality

- The majority (94%) of Academia Professors are Spanish (as would be expected from a programme aimed at tenured academics in Catalan universities) with the remaining 6% being other EU nationalities
- 79% undertook their undergraduate and Masters degrees in Catalunya and therefore might be expected to consider themselves Catalan. 67% undertook their PhD in Catalunya, while 9% undertook their PhD in other parts of Spain and just under a quarter outside of Spain

In terms academic experience

- Just over half of Academia Professors (54%) have several years international experience gained at post-doctoral level and/or later in their careers and 42% have undertaken shorter stays overseas as visiting scholars or researchers
- As a group, on application to the Academia programme, the Awardees had a mean age of 47 and 18 years of professional experience since gaining their PhD. The majority (64%) were already Full Professors and the remaining 36% were Associate Professors

The bibliometric data confirm that the selection process is effective in selecting the highest quality candidates among the applicants and the interviews, bibliometrics and European Research Council grant data suggest that those selected also represent the better research-active professors within the Catalan system. Nonetheless, in terms of research quality and impact the ICREA Seniors outperform the Academia Professors.

0.4 Outputs

As ICREA is not the employer of the Academia Professors it does not systematically collect data on them in the same way as it does for ICREA Seniors. The evaluation gathered a range of output data and information aligned with the programme’s intended effects.

The programme directly supports the intensification of research activities. 92% of Academia Professors reported that the programme has enabled them to reduce their teaching load and spend more time on research. The additional time spent on research is significant. Before the award only 15% were able to devote 75%-90% of time on research, while during the award 60% were able to do so and a further 20% devoted more than 90% of their time to research. The professors achieve this by using their ICREA funding to hire staff (typically contract Associate Professors or Research Assistants) to lighten their teaching load and/or to hire PhD students or post-docs to assist with their research. Funds are also used to support travel to conferences and collaborations with overseas research groups.

The benefits of having a reduced teaching load however exceed a simple increase in the time spent on research. Academia Professors report the importance of gaining flexibility and control over their time and having more time to plan and implement longer-term programmes of research and guide a research group and, particularly for younger professors, to develop and lead their own independent programme of research. The flexibility also offers more opportunities to develop and extend their professional networks, particularly internationally, through attending conferences, visiting other research groups, participating in research committees and editorial boards etc.

The additional time also enables professors to bid for additional research funding. Two-thirds of awardees have secured additional funding for their research since gaining their Academia award. A total of €7.9M new funding has been raised, 57% more than before their awards. This is an average of just under €100k per researcher who reported securing new funding. The majority of this has been gained from Spanish public sources, followed by international sources such as the EU, the private sector, Catalan public sources and internal university funds. In percentage terms the largest increase was in EU funding illustrating that Academia Professors have increased their ability to bid for and win such funding. They also report the positive effect having the time to lead European bids and coordinate projects.
Academia Professors report a wide range of research achievements as a result of their award. The most significant achievements being: supporting and developing junior academics; improving the visibility of their research within Catalunya; an increase in publications; an increase in publications in high impact journals and growth of their research groups. They also report (albeit to a slightly lesser extent) positive effects on the visibility of their research in Spain and internationally and the ability to attend and participate in more research events (conferences etc.). In terms of research collaborations the greater effect is on international collaborations rather than in Catalunya or the rest of Spain. Furthermore the Academia funding not only supports the awardees directly but their wider community through the time and funds they invest in developing their research group and supporting junior academics.

The main output of the research is publications – papers and articles in peer-reviewed journals, monographs, books and book chapters etc. However, as there is a time gap between conducting research and publishing results, for the majority of Academia Professors it is too soon to see a strong effect on publication numbers or in bibliometric-based quality and impact indicators. Nevertheless the Academia Professors clearly report that the award has had a distinct impact on the quantity and quality of their research. 96% reported an increase in publications as a key achievement and 67% reported an increase in publications in high-impact journals. The evidence from the interviews with awardees mirrors the survey with all interviewees reporting an increase in the quantity and quality of their research outputs as a direct result of having more time not only to conduct research but also to plan and design high-quality, and sometimes riskier, research. Many report that they have finally been able to implement research ideas that they had been deliberating over for some time previously. They also have had time to improve research quality through engaging in more research collaborations with international colleagues and peers.

The Academia programme has had little effect on the career progression of awardees in terms of their formal academic grade. This is not surprising as the majority (64%) are already Full Professors on application, so there was little scope for further progression. However, a large proportion of awardees (60%) have gained new leadership responsibilities as a result of having more time for research. In most cases this is new leadership responsibilities in their research team or new leadership responsibilities in their department and a small number within the wider university. Academia Professors value highly the independent recognition of their research provided by ICREA, and the subsequent internal recognition and raised profile it gives them within their university.

0.5 Outcomes and Impacts
As already described, it is too soon to discern any impact of the Academia programme in terms of objective measures of improved quality and quantity of research conducted by awardees and their research groups. However there are early indicators of outcomes and impacts.

**Building and developing high quality research groups**

There is evidence of increased research activities over and above that of the Academia Professors themselves. The increased research funding won by awardees is supporting additional research and researchers. 86% reported an increase in the size of their research group and 16% reported the creation of an entirely new research group. The average group size has increased from 9.4 to 13.7 full-time equivalent staff. The largest increase was in the number of junior academics, that is PhD students and post-doctoral researchers. However just under half (44%) also reported an increase in the number of senior academics in their research groups. The degree of internationalisation has also improved with 62% (of those reporting an increase in group size) also reporting an increase in the number of non-Spanish academics in their group. The average proportion of non-Spanish academics in each research group has increased from 22% to 29%. This suggests an increase in the international reputation of the awardees’ research groups.

**Internationalisation of awardees’ research**

There is also evidence of an increase in the internationalisation of research conducted by awardees. Research is an international endeavour and it is important that there is not just a growth in research activity in Catalunya but that the research undertaken is part of the international effort in any particular field. 59% of Academia Professors report that the award has had a large impact on their level of collaboration with international research groups. This is also evident in terms of the publications co-authored with non-Spanish researchers, with the proportion of early Academia
cohorts (in 2008 and 2009) increasing their number of internationally co-authored papers from 3.6% to 9.1%.

Retention of high quality research-active professors in Catalunya

There is little evidence that the programme has a large influence over the retention of high quality research-active professors in Catalunya. Academia Professors already have tenure at Catalan universities and are therefore relatively immobile. The majority of the awardees have followed a very traditional path for Catalan (and Spanish) academics; conducting their undergraduate, masters and PhD studies close to home, going overseas for one or two post-doctoral positions and returning to Catalunya, almost always to the institution at which they studied, to take up an academic position leading to tenure. At this point in their career they are relatively settled in the region they would consider ‘home’. Only a small proportion of applicants was actively seeking a position outside Catalunya when they applied to the Academia programme and none of the awardees report that they would have left their positions in Catalunya without it. There is some suggestion that research-active professors might be attracted to leave universities for research institutes which would reduce the role of universities in the innovation ecosystem and furthermore, the issue of retention may increase in importance as result of the economic situation in Spain and the likelihood of further reductions in university funding.

The impacts of ICREA Academia are expected to extend beyond the individuals supported to their research departments, universities and ultimately to the wider Catalan research system in terms of improved research performance. The wider impacts generally take longer to take effect as they are further, in an organisational sense, from the initial investment. Again, the programme has only been in existence for four years and so wider effects are more difficult to discern. Nevertheless qualitative evidence from a range of regional stakeholders suggests that wider impacts are starting to emerge.

Wider impacts on the universities

Academia Professors themselves and senior university staff both report a positive effect on their departmental colleagues. The Academia Professors (as for the ICREA Seniors) set a standard for conducting research and to some extent ‘raise the game’ for those around them, especially for those who would like to apply to the programme in future and more junior researchers. The unselected Academia applicants also report a strong motivational effect as they seek to improve their research outputs in order to re-apply to the programme. However these effects may be self-limiting as many Academia Professors are already in the better performing departments. Nonetheless, enhancing the profile of existing high quality research groups and departments is in itself a useful feature as, in an academic culture of equality, the external recognition bestowed by ICREA can help improve internal recognition within the university.

Wider impacts on the Catalan research system

The Academia Professors, as might be expected, believe that they have made a significant impact on the wider Catalan system although this is difficult to prove objectively. Not only will it take time for any impacts to manifest themselves, but the proportion of Academia Professors in the Catalan research system is also extremely small and therefore their impact is likely to be difficult to discern in regional level data.

However an important effect is the impact of the Academia programme on behaviour and academic culture. A large proportion of supported professors feel that there has been an impact in terms of stimulating change in the research strategies and practices in Catalan universities and in the recruitment and career development practices in the region through ICREA’s approach of ‘leading by example’. It has put in place new recognition and reward practices for academics that challenge the higher education system. These practices demonstrate that: research can be a full-time (or near full-time) academic activity; departments can accommodate awardees who concentrate on research; and research excellence can be rewarded regardless of age or seniority. The implementation of these new practices has created some frictions and teething problems but they do not appear to have been insurmountable. However there is widespread acknowledgement that ICREA Academia (or ICREA more generally) cannot by itself bring about fundamental change in a system based on legal structures and long-standing tradition. However, it is able to start to show the way and demonstrate that universities can offer and accommodate different career patterns and paths.
0.6 Conclusions and Recommendations

ICREA Academia responds to a well-identified need in the Catalan research system. The ability of Catalan universities to support research-focused academic posts and careers paths and to implement merit-based reward and recognition systems is severely limited by the traditional university structures, employment practices and customs. The ICREA Academia programme addresses this need through the provision of funding for additional teaching staff and/or junior research staff that enables professors to intensify their research activity. In addition, the programme provides a highly visible example of a merit-based recognition and reward system through its selection processes and the salary supplement. In common with its principal programme for Senior Professors, ICREA’s independent peer review selection process administered outside university hierarchies not only demonstrates how such a system works in practice but has publicly identified and supported a group of high quality research-active academics in Catalan universities.

The ICREA Academia selection process is effective in selecting the highest quality candidates among the applicants and there is strong evidence that those selected are among the better quality research-active professors within the Catalan system. However, as the programme is only four years old, it is too soon to determine if the programme has supported a significant increase in the quantity and quality of research outputs.

The supported professors have significantly intensified their research activities, are developing and growing their research groups and winning more research funding. A key aspect of the programme is the additional time available, not only for conducting research but also for preparing research proposals and more active participation in international research communities. In addition, the autonomy resulting from the funding, and the prestige associated with it, are often decisive factors in the development of independent research portfolios and reputations for the early-career awardees. All of these factors generate more opportunities for research, international collaborations and raise the profile of the individuals and also their universities and the Catalan research system.

In addition to the funding to release time for research, the personal prestige and external recognition of their research provided by the ICREA Academia award is a strong motivator for the professors to prioritise research over their other duties and to improve the quantity and quality of research outputs. The salary supplement is seen as an additional component of the external recognition bestowed by the award but in general it appears to be of less influence than the availability of time for research and the public recognition of a professor’s quality. The Academia programme has also enabled universities to gain external recognition of their areas of research excellence. The programme has helped to put individuals and their groups ‘on the map’ in Catalunya and in Spain to some extent, although the programme is less known to an international audience.

The evidence for the impact of the Academia programme on the retention of professors is limited. While Academia Professors would appear to be on average a little more mobile than typical Catalan academics, as tenured professors they are not particularly mobile. There was not evidence that they were being lost in large numbers to the system prior to the programme’s introduction nor that any individual awardees would have left the region without the award. However, there is a growing opinion that retention may become more of an issue in the future as a result of the economic situation in Spain.

Since Academia is an open programme to which applicants apply directly, the universities have had no option but to implement new practices in the allocation of academic duties between teaching and research in order to accommodate the awardees. While this initially created teething problems and some bad feeling among colleagues, for the most part awardees have been accommodated and, for the more recent applicants, most of the challenges have been overcome. Therefore the programme can be seen to have led universities into trying new models for academic resource allocation and, along with other related policy measures in Catalunya, appears to be part of a process of change in thinking. However, ICREA alone cannot create sustainable behavioural or systemic change in the Catalan research system not only due to its relatively small scale but also due to the legal constraints at the national level, in particular those related to the terms and conditions of academic employment in public universities.
The problems in the Catalan research system that ICREA Academia seeks to overcome still remain and there is still a role for the programme and therefore there is no need for ICREA to fundamentally change its strategy with respect to the Academia programme. We recommend the programme is continued. Nevertheless there are a number of improvements that could be made.

**Clarify the next phase of the ICREA Academia programme**

As the first professors are approaching the end of their Academia awards, there is considerable concern as to their future with respect to continued access to support from ICREA. At the same time, ICREA is quite clear in private that award holders will be able to re-apply for support in competition with new-comers. We recommend that ICREA work quickly to publicise their guidelines/rules for re-application and implement a process that ensures that future calls enable existing/previous Academia Professors to re-apply alongside new-comers, keeping a strong focus on selecting only the very best professors for support.

**Consider adjusting the financial model**

The most important aspect of the Academia award, in terms of both its attractiveness to applicants and impact, is the funding that provides more time for research (i.e. funding additional teaching and/or research staff), while the salary supplement appears to be of less importance. Therefore there is an opportunity to adjust the Academia financial model. This might entail, for example, a reduction in the salary supplement (and so releasing funds for either more awards or longer awards) or a more flexible approach to the use of the funding, such as allowing each awardee to choose how to allocate the funding between direct support for research and the salary supplement. However, as already noted, in the current economic the salary supplement may become more important and therefore any change to the model is likely to be somewhat contentious. Therefore we recommend that ICREA consider adjusting the financial model of ICREA Academia and that it conduct a consultation process with current ICREA Academia Professors (and possibly the current applicants to the programme) to identify their views on possible alternative models.

**Consider sub-dividing the programme to support different career stages**

To ensure the programme is able to support high quality research-active professors at various stages of their career, ICREA should consider adopting an approach similar to the ERC whereby the programme is sub-divided into different categories based on the number of years experience post-PhD. This would not only result in a selection process that assesses professors with similar levels of experience but would allow the Catalan Government (or ICREA) selectively to support different career stages, in pursuit of policy to meet Catalonia’s needs, by adjusting the balance of funding between different sub-programmes.
Evaluation of ICREA Academia

1 Introduction

Technopolis was commissioned to conduct an evaluation of the Academia Programme of the Institució Catalana de Recerca i Estudis Avançats (ICREA) to complement a previous evaluation of ICREA support for Senior Professors in 2010.¹

ICREA was established in 2001 with the aim of strengthening the Catalan research system by bringing high-quality international researchers into the region. Its main role was (and is) to recruit and fund international researchers and embed them in Catalan universities and research institutes and centres as ICREA Senior Professors. In 2008 the ICREA role was broadened to include the provision of fixed-term financial support for high-quality university professors already based within the Catalan university system through a programme called ICREA Academia. The support is intended to enable university professors to focus on research, develop their research reputation and ensure that existing talent is retained and developed in Catalunya.

The evaluation seeks to understand and assess the performance of the programme after four years of activity, in order to

- Confirm the quality of the professors selected by ICREA Academia
- Provide evidence to demonstrate ICREA Academia awardees’ contribution to strengthening the research system in Catalunya
- Identify opportunities to improve ICREA’s effectiveness

Throughout this report the people supported by the scheme are referred to as ICREA Academia Professors or awardees and the programme is referred to as ICREA Academia.

2 Evaluation Methodology

2.1 The Intervention Logic and Evaluation Questions

The evaluation methodology is based on identifying an ‘intervention logic’ for the programme evaluated. The logic explains why the intervention is needed and describes its intended effects, generating a set of questions for the evaluation.

Figure 1 shows the intervention logic for the ICREA Academia programme in terms of its inputs through to its intended impacts via its activities, immediate outputs and intermediate outcomes.

¹ Evaluation of ICREA, March 2010, Technopolis
### Problem/ Rationale
- **Inadequate research performance of Catalan research system**
  - Specifically, the low amount of high quality research conducted in Catalan public universities

### Evaluation of ICREA Academia intervention logic

<table>
<thead>
<tr>
<th>Problem/ Rationale</th>
<th>Objective</th>
<th>Inputs &amp; Activity</th>
<th>Outputs</th>
<th>Outcomes</th>
<th>Wider Impacts</th>
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| Inadequate research performance of Catalan research system | Create new funding mechanisms that:  
  - Strengthen the importance of research for university professors by allowing a deeper dedication to research  
  - Enable university professors to develop research portfolios and careers of international quality  
  - Stimulate wider change in the Catalan research system by increasing awareness of the importance of research in universities  
  - Retain existing high-quality research talent in Catalan universities | Inputs: public funds to enable existing tenured high-quality professors in Catalunya to spend more time on research  
Activities:  
  - Identifying & selecting appropriate researchers for ICREA Academia support  
  - Providing funding to ‘buy out’ teaching time plus personal financial incentives to encourage wider range of researchers to apply | Intensify research activity undertaken by ICREA Academia researchers  
- Increased research funding from external and competitive sources won by ICREA Academia researchers  
- Increase in quantity and quality of research outputs delivered by ICREA Academia researchers | High-quality university-based researchers retained in Catalunya  
- Establishment/growth in high-quality research groups  
- Increased esteem of research groups/departments hosting ICREA Academia researchers  
- Increased internationalisation of research groups/departments hosting ICREA Academia researchers | Contribute to an improvement in research performance of Catalan universities  
  - Improved Catalan reputation for research (incl. attitudes)  
  - Higher position in relevant rankings  
  - Increased external funding income for research and higher education  
  - Increased strength of research groups, leading to sustained better performance |

Based on this intervention logic we developed the following **evaluation questions**

1. Does the activity of ICREA Academia correspond to needs in the Catalan research system?  
   **Rationale**

2. What is the quality of the Academia Professors selected by ICREA? How do they compare to the ICREA Seniors?  
   **Inputs**

3. Has the programme led to the retention in Catalunya of good research professors who would otherwise have left?  
   **Outputs**

4. What have the effects been on the research of ICREA Academia Professors?  
   - Have their research activities and outputs increased?  
   - Is their research of a better quality?  
   - Are these effects different depending on the age of the professor (i.e. professors at different points in their career), that is, what is the effect of externally pricing professors particularly younger professors at an earlier point in their academic career?  
   **Outputs**

5. What have the effects been on research in the participating universities?  
   - Has the existence of ICREA Academia Professors had an influence on their colleagues, departments in terms of the quantity and quality of research undertaken/ is it expected to have such an influence in the future?  
   - Are there different kinds of effects, for example between institutions receiving large and small numbers of ICREA Academia professors?  
   - Are there any unintended consequences?  
   **Outcomes**

6. Has the funding led to sustainable changes in the Catalan research system?  
   **Impacts**

7. Should ICREA’s strategy change?  
   - Has its ‘mission’ been accomplished?  
   - Have the needs of the research system changed?  
   - Does the Academia scheme interact with the mainstream ICREA programmes?  
   **Continued Need/ Rationale**

The evaluation questions and evaluation framework are intentionally similar to those used in the evaluation of the ICREA Senior Professors programme in order to enable comparison between the two programmes.
2.2 Data Collection

A mixed approach to the evaluation was taken that allowed data from a range of sources to be analysed and triangulated to form robust conclusions. The evaluation collected and analysed data from the following sources:

- Desk research to develop an understanding of the Academia Programme and to quantify the understand the inputs, activities and outputs
- An online survey of all ICREA Academia Professors currently in post
  - The survey received a 104 responses from the 107 ICREA Academia awardees, a response rate of 97%
- A programme of semi-structured interviews with a range of stakeholders to gather qualitative data about the programme and to supplement the quantitative survey data. A total of 22 interviews were conducted (of which nine face-to-face interviews) with people having one or more of the following roles:
  - 13 x individual ICREA Academia awardees
  - 10 x senior staff at Catalan universities - including Vice-Rectors of Research and heads of departments in which several Academia awardees are based
  - 6x applicants to the Academia programme who were not selected for an award
- Bibliometric analysis of the research production of ICREA Academia Professors compared with unsuccessful ICREA Academia applicants and with researchers in the Catalan, Spanish, ERA and international research systems

Whenever relevant, the evaluation team also made use of the findings of the evaluation of the ICREA Senior Professors scheme, in order to strengthen the analysis.

The survey questionnaire and list of interviewees are provided in Appendix A and Appendix B.

2.3 Report Structure

The report follows the structure of the logical framework presented above.

- Chapters 3 to 6 present the segments of the logical framework from rationale through to impacts and address the first three evaluation questions
- Chapter 7 presents the conclusions and recommendations
- Chapter 8 synthesises the evaluation findings against all the evaluation questions with particular emphasis on the final two evaluation questions that focus on the extent of change created in the Catalan research system and future strategy for ICREA
3 Context and Rationale for ICREA Academia

3.1 Context

There is a strong drive within Europe to modernise universities to enable them to maximise their contribution to the knowledge-based society via their roles in both education and research. Traditional governance systems in large parts of Europe do not have the flexibility to allow universities to act entrepreneurially, preventing the design and implementation of unique institutional strategies in response to local, national and international needs. The modernised university has greater autonomy, strong and professional leadership, more diversified funding sources and is much more outward facing.

In Spain the university governance system is still a long way from the modern university model. A strong level of national regulatory control over all public universities combined with the civil servant employment status of academics and representative (voting-based) collegial governance models within universities has resulted in inflexible bureaucratic management systems with considerable power devolved to the academic college. The result is a largely closed, inward-looking university system driven by corporate academic interests, where decisions are slow and the elected authorities are continuously subject to a veto against change.

Modern universities need to focus on both education and research and also undertake activities to ensure that research outputs flow into wider society. Historically Spanish universities have placed a stronger emphasis on education than research, with this emphasis embodied both in employment contracts, which specify teaching but not research commitments, and in a university resource allocation system that is primarily based on numbers of students. In addition, academic career progression and salaries are largely dependent on length of employment rather than individual performance. As a result, the majority of academic time is assigned to teaching duties and there are few incentives to undertake research. This is not to say that academics do not conduct research but that the system does not readily facilitate research or actively encourage it. Academic careers are centred on teaching and there is limited flexibility in employment contracts or resource allocation to enable universities to support full-time or near full-time researchers. This constrains the quantity and quality of the output from the Spanish research system. High quality research is an intensive endeavour that not only requires sufficient time to conduct research but also time to engage in international networks to participate in the flow of knowledge and skills among researchers and research groups. Furthermore, to conduct the highest quality research and participate in global research networks, universities and research institutes compete nationally and internationally to attract the best researchers, who are mobile between universities and countries. In Spain and Catalunya, the quantity and quality of research conducted in universities suffers as a result of the low level of research activity plus the small ‘gene pool’ of researchers and the civil service jobs-for-life guarantee, which places no great emphasis on academic performance.

3.2 Rationale for ICREA Academia

Catalunya is the leading region within Spain in terms of research and innovation performance but it compares less favourably on the international stage. Although an autonomous community, it suffers from the same constraints on its research system as the rest of Spain. This is particularly the case where universities are concerned as the contribution of universities to Catalunya’s R&D performance and research funding is rather low. The higher education sector accounted for 41% of research personnel in Catalunya in 2010 but accounted for just 23% of R&D expenditure in Catalunya. This implies a lower average spending per researcher in universities relative to other research actors within Catalunya.

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2 OECD, 2009, Reviews of tertiary education, Spain.
3 Based on data from the Spanish national institute of statistics: www.ine.es (consulted october 2012)
These challenges have been identified since the early 2000s and led to the creation of ICREA by the Catalan Government in 2001 along with a range of other measures to improve the Catalan public research system. These included the CERCAs, a group of new largely autonomous research centres, a new university with a strong international outlook and a Catalan system of university employment contracts running in parallel to the national system.

ICREA was established to improve the internationalisation of the research system by attracting and recruiting high-quality researchers, with established international reputations, from outside the region into Catalonia’s research and higher education organisations. In addition, it was intended to stimulate a stronger research culture and promote change, particularly within Catalan universities, by demonstrating the potential for, and benefits of, full-time (or near full-time) academic research posts. This latter goal was developed further with the introduction of the ICREA Academia programme in 2008. It provides funding to existing tenured professors in Catalan universities to enable them to intensify their research activity by significantly increasing the time devoted to research. In addition, it provides a salary boost to awardees in order to experiment with the concept of performance or merit-based salaries in Catalunya. Together these two factors were intended to ensure that existing high-quality research-focused professors could be retained in the Catalan system.

In summary, the rationale for the ICREA Academia programme was a need to address rigidities in the Catalan research system that had led to reduced opportunities for research-focused careers in Catalan universities and a corresponding risk that high quality research-active university professors would move to countries and institutions more amenable to research careers.

The objectives of the ICREA Academia Programme are to
- Incentivise research excellence and research intensification among university staff; and by doing so to stimulate change in Catalan universities
- Retain high quality research-focused professors - particularly those at an active and expanding stage in their research careers who tend to be more mobile

3.3 The ICREA Academia Model

ICREA Academia provides a five year fixed-term financial award to existing high-quality tenured university professors\(^4\) to enable them to decrease their teaching load and spend more time on research. It provides funding of €50,000 per award per year to be utilised as follows: €20,000 to support increased research activities; €25,000 as a personal financial award for the academic researcher; and a €5,000 administration fee for the university. It is entirely at the discretion of the awardee as to how the €20,000 for research is used. In most cases it is used to hire replacement teaching staff to free up the awardee’s time, hire research assistants to support the research process or to fund specific research activities directly.

The programme is particularly aimed at high quality university professors who are at an ‘active and expanding stage’ of their career and who have considerable potential to develop their research career further. It is not intended to act as a reward for long-standing academic careers. Any tenured professor may apply to scheme and the quality and potential of applicants is assessed by international peer review. In addition to providing a system of financial support for research, the programme’s features are intended to circumvent and challenge the traditional university culture in two ways. Firstly the egalitarian approach to academic duties at Spanish universities, in which all academic staff have the same teaching duties regardless of their research productivity; and secondly, the alignment of salary increases with seniority rather than performance. By doing so, it seeks to increase the opportunities available to research-focused professors and so prevent them seeking positions elsewhere and stimulate change in university recruitment practices and career development paths.

The programme is intended to support the highest quality research academics in Catalan universities and therefore, as for the ICREA Senior Professors, awardees are evaluated and selected

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\(^4\) Applicants and awardees of the ICREA Academia programme are a mixture of Full Professors and Associate Professors
by international peer review. Once awarded the professors are expected to devote themselves primarily to research and their universities are expected to support them to do so.

The key features of the ICREA Academia model are presented in the table below.

Figure 2 The ICREA Academia model

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
</table>
| **HIGH QUALITY PROFESSORS**  | • Targeted at high-quality research-focused academics in Catalan universities  
• Professors are selected by international peer review based on similar criteria to the ICREA Seniors  
  - High standard research production rate with clear future potential and their research should have clear future potential  
  - Applicants should be at an active and expanding stage of their research career with the potential to develop their research portfolio and research reputation further |
| **FINANICAL FEATURES OF THE AWARD** | • ICREA Academia is a fixed-term award for five years  
• Each award is assigned €50,000 per year from ICREA. This is allocated as follows:  
  - A personal award (€25,000 gross) which the selected researcher may use as he/she wishes  
  - Financial assistance (€20,000) to the university to which the researcher belongs. This assistance must be used, based on an agreement between the ICREA Academia researcher and the university to fund research projects and/or actions directly related to his/her research activity - in particular, for the purpose of hiring staff so that the teaching duties of the researcher can be reduced.  
  - An administration fee (€5,000) for the university to which the researcher belongs  
• Awardees will be able to re-apply, in competition with all new applicants, once their five years comes to an end |
| **RESEARCH FOCUS**           | • ICREA Academia Professors must devote themselves primarily to research activities for the five years duration of the award. This may include temporary visits to other universities /centres outside Catalunya provided they are authorised by the university and ICREA |
| **SIMPLE PROCESSES**         | • Individual applications made directly by the applicants via an online process (the universities are not involved)  
• Applicants supply ICREA with a full CV in English along with a selection of the five most significant publications, research projects, awards and honours and other research achievements over the past five years, as well as a research plans for the next five years  
• Professors are asked to submit a scientific report on their research activities every year to ICREA |
| **TERMS AND CONDITIONS / ELIGIBILITY** | • The programme is open to staff who hold doctorate degrees and who have tenure (i.e. employed under contract or as civil servant) at Catalan public universities  
• Applicants should be working full-time  
• Participating universities and ICREA sign a programme participation agreement  
• N.B. The eligibility was broadened in 2012 to include university professors who conduct their research in CERCAs |

Source: ICREA Guidelines and interviews with ICREA staff

3.4 Confirmation of the ICREA Rationale and Model

3.4.1 Rationale for ICREA Academia

There was a consensus among evaluation interviewees that there is a strong need for the ICREA Academia programme. Senior staff at universities, Academia Professors and unselected applicants confirmed the considerable constraints on academics wishing to pursue research-focused careers in Catalan universities. The most important factor was the high teaching load required by the university system that leaves limited time for research. Specific examples of the constraints include the fact that teaching loads are enshrined in academic employment terms and conditions and are non-negotiable, salary increases are predominantly aligned with length of time in post and not research performance, and the existence of a culture of equality in which all academics, regardless of seniority or research intensity, have the same teaching load. The reasons for this situation are a
combination of national law on academic employment and a culture that views universities primarily as educational institutions. Together these factors create no strong incentive for universities to find ways to shift the balance between teaching and research or to offer different career structures and career paths.

Therefore ICREA Academia meets a need of the higher education research system in that it enables professors, who have already demonstrated their commitment to research and are generating high-quality outputs, to intensify their research activities and further develop their research portfolio and reputation. The interviewees report that there is no other programme or policy that enables such an intensification of research on such a scale – that is the ability to focus on research almost full-time and for five years.

Interviewees also made it clear that as ICREA started to demonstrate the benefits of supporting high-quality research through its role in recruiting international researchers, it highlighted the lack of ability to support such careers within the existing university system. Therefore, in their view, a key part of the rationale for the Academia programme was the need to offer similar opportunities, not otherwise available, to existing university professors.

The related aspect of the rationale for ICREA, that high-quality research-focused professors in Catalan universities would leave the region for positions elsewhere, was less well supported by the interviewees. The general view across the different stakeholder groups is that people supported by the Academia programme are fairly typical Catalan and Spanish academics in that they have returned to their ‘home’ region after several years abroad, hold tenured positions and are now relatively immobile. While they may be frustrated by the lack of support for research careers, in most cases this frustration is insufficient to cause them to seek alternative positions. Interviewees note however that there is a range of mobility with the very best research-active professors, with the most international experience, in high-demand disciplines being more likely to receive attractive offers from overseas institutions. The evidence from our survey of Academia awardees is a little more mixed; around a quarter were actively seeking a new post when they applied to the programme and around half report some retention effect from the programme. This evidence is presented and described in more detail in section 6.1. However the interview evidence suggests that importance of the programme to retaining high-quality professors may increase in the coming years if public sector salaries and research funding continue to decline.

Therefore, there was a consensus among evaluation interviewees that the rationale for ICREA Academia in terms of overcoming rigidities in the Catalan higher education system was, and is, valid. However the evidence for the aspect of the rationale for the programme related to the retention of existing high quality professors, is less clear cut.

### 3.4.2 Alignment of the ICREA Academia model with the need

The model of the Academia support addresses the practicalities of enabling academics to focus on research and, by leading by example, demonstrates that performance-based positions can be accommodated by Catalan universities. The financial model serves two roles; it provides funding to increase research activity by ‘buying-out’ teaching time and, via the salary supplement, puts a performance-based reward system into practice, with the latter feature supported by the peer-review evaluation and selection process.

The number of applications demonstrates a significant demand for such support within all the region’s universities and, in the main, all universities have been willing and able to provide the support to Academia awardees to meet the programme’s requirements.

For the ICREA Academia Professors, the model meets their requirements in a number of ways. Figure 3 and Figure 4, which present their motivations for applying to the programme, illustrate that the most important feature is the ability to devote themselves to research and the benefits this leads to such as the opportunity to develop their research improved reputation and to expand their research groups. The interviewees report that the funding to hire additional teaching staff is essential to the increase in research activity.

The prestige of the award is also very important to the Academia Professors. The interviews showed that not only is the external independent recognition of their research performance valued in and of itself but it is also important for the increased visibility it gives them within their universities. The
salary supplement is also important but to a slightly lesser extent. It is of course, welcomed by all who receive it, and it appears to be particularly valued for its role in reinforcing the recognition of individual performance bestowed by Academia and the demonstration of performance-based awards. However, while the salary supplement is important it does not appear to be the decisive factor in applying to the programme, except in the case of the most mobile professors who are able to command higher salaries elsewhere.

Figure 3 Motivations for applying to the ICREA Academia programme

![Motivations for applying to the ICREA Academia programme](image)

Technopolis, Survey of ICREA Academia Professors, n=103

Figure 4 Single most important factor in applying for ICREA Academia

<table>
<thead>
<tr>
<th>Which factor (see list in Fig 4 above) was the most important motivation</th>
<th>No. of respondents</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opportunity to devote myself primarily to research</td>
<td>58</td>
<td>57%</td>
</tr>
<tr>
<td>Opportunity to expand my research activities (e.g. create or expand your research group, hire additional research staff)</td>
<td>14</td>
<td>14%</td>
</tr>
<tr>
<td>Opportunity to access funding for research</td>
<td>7</td>
<td>7%</td>
</tr>
<tr>
<td>Opportunity for career progression</td>
<td>3</td>
<td>3%</td>
</tr>
<tr>
<td>Prestige of the ICREA Academia award</td>
<td>10</td>
<td>10%</td>
</tr>
<tr>
<td>Salary increase not otherwise available</td>
<td>8</td>
<td>8%</td>
</tr>
<tr>
<td>Opportunity to develop my research reputation</td>
<td>2</td>
<td>2%</td>
</tr>
<tr>
<td>Total number of respondents</td>
<td>102</td>
<td>100%</td>
</tr>
</tbody>
</table>
4 Programme Inputs and Activities

4.1 Number of ICREA Academia Professors

Since 2008 ICREA has held four annual calls for applicants to the Academia programme and made awards to 107 professors (Figure 5 and Figure 6). ICREA report they have intentionally reduced the number of awards each year to ensure the quality of selected professors remains high – as each successive call effectively removes the best professors from the pool of applicants.

The 107 awardees were selected from a total number of 1,181 applications submitted by 742 individual professors, indicating that there is a high tendency for applicants to re-apply to the programme if unsuccessful the first time. While some applicants are successful after several attempts, the success rate reduces with multiple applications (Figure 7). The overall success rate of 9% is the same as that for ICREA Seniors.

The number of applicants reduced slightly each year between 2008 and 2010 but increased in 2011 (Figure 8), therefore a steady annual success rate of 10-11% decreased to 4% in 2011. While the evaluation evidence we could collect provided no indication as to the reason for the increase in application it may well be a consequence of recent public sector salary cuts made by the Spanish government to address the economic situation in Spain.

Figure 5 Key Figures – ICREA Academia programme

<table>
<thead>
<tr>
<th>Awards and applicants (2008-2011)</th>
<th>Number</th>
<th>Success rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of ICREA Academia awards made</td>
<td>107</td>
<td>N/A</td>
</tr>
<tr>
<td>Total number of applications</td>
<td>1,181</td>
<td>9%</td>
</tr>
<tr>
<td>Total number of individual applicants</td>
<td>742</td>
<td>14%</td>
</tr>
</tbody>
</table>

ICREA management data

Figure 6 Number of ICREA Academia awardees per call and total in post (2008-2011)

ICREA management data
Figure 7 Multiple applications to ICREA Academia (applicants and awardees)

ICREA management data

Figure 8 Number of applicants and awards (per year)

ICREA management data

4.2 Budget

The greater part of ICREA’s budget is spent on the salaries of the ICREA Senior Research Professors (and the few remaining ICREA Juniors) as this is the group of people for which ICREA is entirely responsible. The Academia Professors are already salaried academics employed by their universities and the ICREA funding is additional.

Figure 9 presents the ICREA budget since 2008 when the Academia programme was added to its portfolio. It presents actual expenditure for 2008 to 2012. In the current year (2013) the ICREA budget was €29 million. The Academia programme represented 5% of the total budget in its first year, growing to 21% in 2013 (Figure 10) when the maximum number of awards made by the programme will be in place (under a programme that supports professors for five years). 5

Running costs are currently 1.5% of the total budget. This figure is at the lower end of the typical range of administrative costs for research councils. Running costs as a proportion of total costs have decreased over time as a result of economies of scale as researcher numbers increase but also as its processes have matured and become standardised. This very efficient administration is a result of

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5 Typically each call starts funding professors between 6 to 12 months after their selection, therefore professors selected in the 2012 call (yet to occur) will receive their first funding during 2013.
simple and unbureaucratic operational processes and the very low administrative requirements it imposes on awardees.

ICREA is managed by a small team of six staff that is responsible for administering and managing the two ICREA Schemes (ICREA Academia, ICREA Seniors)\(^6\) plus the promotion of ICREA and collecting and compiling annual reports.

Figure 9 ICREA budget (2008-2013)

ICREA management data (2008-2012 data are actual expenditure, 2013 data are taken from the ICREA strategy document)

Figure 10 ICREA budget (2008 - 2013) as percentages

ICREA management data (2008-2012 data are actual expenditure, 2013 data are taken from the ICREA strategy document)

\(^6\) The ICREA Junior programme was discontinued in 2007
4.3 Operations

4.3.1 Calls and applications

ICREA makes an annual call for applications to the Academia programme, which it publishes on its website. All applications are submitted online. The programme is open to tenured professors at all seven Catalan universities and across all research disciplines. ICREA takes a 'bottom-up' approach to the identification of ICREA Academia awardees and while it defines a target for the total number of awards made for each call, it has no pre-defined target for each disciplinary field.

As the goal for the programme is to support very active and productive research-focused professors conducting research programmes with potential for significant impact rather than to reward long-standing careers, it requires applicants to submit a list of research activities and results (including the five most significant publications and a list of research projects, awards and honours) covering just the preceding five years, plus a full CV and their research plans for the next five years.

4.3.2 Selection process

As in the ICREA Senior researcher calls, research quality is the main selection criterion and the assessment process is based on international peer review. Five evaluation committees (in each of the five research disciplines: Experimental Science and Mathematics; Life and Medical Sciences; Technology and Engineering; Social and Behavioural Sciences and humanities) composed of four to six internationally renowned experts evaluate all the applicants in their field in a two-stage process.

First, each member independently evaluates each applicant based on guidelines provided by ICREA, with particular focus on research quality, leadership and potential for future high impact research. An overall score and written feedback is recorded via an online system. The five expert committees then meet to review the independent evaluation scores. The second stage serves to normalise or calibrate the scores from different reviewers and to reach a consensus among the review group in the form of a ranked list of applicants in their field. Awardees are selected from the list, starting with the highest ranking, according to the number of posts available.

4.3.3 Feedback on operations

Figure 11 presents the survey data from Academia awardees. A very large majority view all aspects of programme operations as effective and efficient with between 80% and 100% agreeing or strongly agreeing with all statements about operations – the marketing, information, and application and evaluation processes – as well as the appropriateness of the design of the funding model. As reported in section 3.4.2, the funding to support research, mainly used to buy-out teaching time, is the most highly valued feature of the funding model, with the salary supplement of slightly less importance. In general all stakeholder groups recognise and appreciate ICREA's simple and efficient operational processes.

The views on operations varied somewhat across the different stakeholder groups. Interviewees from all stakeholder groups viewed the external evaluation of applicants as effective and appropriate in that the best professors are selected. The awardees have the most positive view, while senior university staff and unselected applicants have some concerns at the margins with respect to the selection or non-selection of particular individuals but nonetheless acknowledge that the programme selects the best professors. Where concern was expressed by interviewees, most commonly it regarded a desire for greater transparency in the selection processes and more detailed feedback to the unselected applicants.

There was some concern among senior university staff, unselected (and a few selected) applicants about the clarity of the objectives of the programme. The particular issue being the career-stage the programme intends to support. While there was a general understanding that the programme is targeted at people at the early-to-mid stage of their academic career who therefore have scope to further develop their research portfolios, some interviewees were concerned that this was not

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7 Since the 2011 applications are also accepted from university professors who conduct their research at CERCAs
necessarily borne out in practice, in particular that awards were being made to people at a much later stage in their career. This perception would appear to be a result of a number of connected factors. The main issue being that the programme documentation (the call documents in particular) does not explicitly mention the target career-stage of applicants but instead refers to it in a more indirect fashion - in terms of the programme being particularly aimed at ‘those who are at an active and expanding stage in their research activity’. This means that the definition is open to interpretation and, as a result, applicants at all stages of the academic career path apply, up to and including those quite near to retirement. The profile of the pool of applicants to the programme in terms of career stage (and their corresponding age profile) then has a direct effect on the career-stage profile of awardees. The average age of both selected and unselected applicants is very similar (47 for selected and 48 for unselected – see section 4.5.2).

Figure 11 Survey results: Academia awardees’ opinions on operational aspects of ICREA

4.4 Distribution of ICREA Academia Professors

By design, ICREA as a foundation responds to needs in the Catalan research system and therefore it sets no targets as to the discipline or field of the professors it selects, nor the universities in which they are based.

4.4.1 By university

ICREAs are hosted across all the seven public universities in Catalonia, with the majority (more than 60%) based in the region’s two largest universities – the University of Barcelona (UB) and the Autonomous University of Barcelona (UAB) – followed by the University Pompeu Fabra (UPF) with 18% of Academia Professors. (Figure 12 and Figure 13). These are also the universities the highest international reputations in terms of the Catalunya region and Spain as a whole. The remaining 21% of Academia Professors are distributed among the Polytechnic University of Catalonia (UPC) with 9% and the smaller Catalan universities - Rovira i Virgili University (URV), University of Girona (UdG) and University of Lleida (UdL). This distribution largely reflects the distribution of the academic population among the region’s universities except for a higher proportion of Academia professors at UPF and slightly lower proportions at UPC, URV, UdG and UdL (Figure 14). Overall the number of Academia Professors supported represents less than 1% of the total academic population in Catalunya.

8 UB, UAB and UPF are regularly the highest ranking Spanish universities in the THES/QS and AWRU university rankings for example. The high quality of research outputs of these three universities is also shown in “Anàlisi comparativa internacional de la producció científica dels agents de recerca de Catalunya”, Generalitat de Catalunya November 2010
This distribution among the regions’ universities is fairly similar to the pattern for ICREA Seniors with the exception of UPF that has an even greater proportion of ICREA Seniors than it has Academia Professors. UPF, although a relatively small university, was established in 1990 with an international outlook and a strong research focus and it made full and proactive use of the ICREA Senior Programme to recruit international researchers. ICREA Academia cannot be used in this way as applications are made directly to ICREA by individual professors with no input from the university (see section 4.6).

Figure 12 Distribution of ICREA Professors by university (Academia and Seniors)

<table>
<thead>
<tr>
<th>Name</th>
<th>Number of ICREA Academia Professors (2011) (n=107)*</th>
<th>%</th>
<th>Number of ICREA Senior Professors (2009) (n=120)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Barcelona (UB)</td>
<td>37</td>
<td>35%</td>
<td>38</td>
<td>32%</td>
</tr>
<tr>
<td>Autonomous University of Barcelona (UAB)</td>
<td>28</td>
<td>26%</td>
<td>27</td>
<td>23%</td>
</tr>
<tr>
<td>Pompeu Fabra University (UPF)</td>
<td>19</td>
<td>18%</td>
<td>37</td>
<td>31%</td>
</tr>
<tr>
<td>Polytechnic University of Catalonia (UPC)</td>
<td>10</td>
<td>9%</td>
<td>8</td>
<td>7%</td>
</tr>
<tr>
<td>Rovira i Virgili University (URV)</td>
<td>8</td>
<td>7%</td>
<td>4</td>
<td>3%</td>
</tr>
<tr>
<td>University of Girona (UdG)</td>
<td>3</td>
<td>3%</td>
<td>3</td>
<td>3%</td>
</tr>
<tr>
<td>University of Lleida (UdL)</td>
<td>2</td>
<td>2%</td>
<td>2</td>
<td>2%</td>
</tr>
<tr>
<td>Total number ICREA researchers hosted by universities</td>
<td>107</td>
<td>100%</td>
<td>120</td>
<td>100%</td>
</tr>
</tbody>
</table>

ICREA management data / Technopolis Evaluation of ICREA.

* The data is presented for Academia awardees based on their university at the time the award was made. We are aware of one Academia Professor who has moved university (within Catalunya) since receiving the award. There may be others and therefore the change is not reflected in the data presented.

Figure 13 Distribution of ICREA Professors by university (Academia and Seniors) – Chart

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Evaluation of ICREA Academia
Figure 14 Proportion of ICREA Academia Professors hosted by Catalan universities (2001-2010)

<table>
<thead>
<tr>
<th>Name</th>
<th>Number of ICREA Academia Professors</th>
<th>% of ICREA Academia Professors of total number of academic staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Barcelona (UB)</td>
<td>37</td>
<td>0.8 %</td>
</tr>
<tr>
<td>Autonomous University of Barcelona (UAB)</td>
<td>28</td>
<td>0.8 %</td>
</tr>
<tr>
<td>Pompeu Fabra University (UPF)</td>
<td>19</td>
<td>1.8%</td>
</tr>
<tr>
<td>Polytechnic University of Catalonia (UPC)</td>
<td>10</td>
<td>0.4%</td>
</tr>
<tr>
<td>Rovira i Virgili University (URV)</td>
<td>8</td>
<td>0.5%</td>
</tr>
<tr>
<td>University of Girona (UdG)</td>
<td>3</td>
<td>0.3%</td>
</tr>
<tr>
<td>University of Lleida (UdL)</td>
<td>2</td>
<td>0.2%</td>
</tr>
<tr>
<td>Total number ICREA Academia Professors hosted by Catalan universities</td>
<td>107</td>
<td>0.7%</td>
</tr>
</tbody>
</table>

ICREA management data / OECD data

Figure 15 below shows ‘clusters’ of ICREA Academia Professors within Catalan universities, that is departments that employ three or more Academia awardees. A number of the departments that are home to clusters of Academia Professors are also home to clusters of ICREA Seniors. For example the Department of Fundamental Physics at the UB has four Academia Professors and three ICREA Seniors (as of 2010) and the Department of Information and Communication Technologies at the UPF has five ICREA Seniors (as of 2010) and six ICREA Academia awardees.

While these departments may be benefiting from the combined strength of both ICREA programmes the clustering is unlikely to be the result of strategic decision-making as applications for ICREA Academia are individual and voluntary and not mediated in any way by the university. In fact senior university staff report that they are not aware of applications and only become aware once the successful applicants are announced. While ICREA Seniors offers more scope for strategic deployment the evaluation in 2010 found little evidence of it being used in this way. Therefore the clustering of ICREAs (both Academia and Seniors) largely reflects existing areas of excellence within Catalan universities (it is an effect rather than a cause). Nevertheless the raised profile of ICREA Academia within departments that have them is likely to encourage further applications.

Figure 15 Clusters of ICREA Academia Professors

<table>
<thead>
<tr>
<th>University</th>
<th>Department</th>
<th>No. of ICREA Academia awardees in department</th>
<th>% of department’s ICREA awardees of all ICREA awardees based in that university</th>
<th>% of department’s ICREA Academia awardees of total number (n=107) of ICREA Academia awardees</th>
</tr>
</thead>
<tbody>
<tr>
<td>UB</td>
<td>Department of Fundamental Physics</td>
<td>4</td>
<td>11%</td>
<td>4%</td>
</tr>
<tr>
<td>UAB</td>
<td>Department of Biochemistry and Molecular Biology</td>
<td>4</td>
<td>11%</td>
<td>3%</td>
</tr>
<tr>
<td></td>
<td>Department of Economics and Economic History</td>
<td>4</td>
<td>11%</td>
<td>3%</td>
</tr>
<tr>
<td>UPF</td>
<td>Department of Experimental and Health Sciences</td>
<td>7</td>
<td>36%</td>
<td>6%</td>
</tr>
<tr>
<td></td>
<td>Department of Information &amp; Communication Technologies</td>
<td>4</td>
<td>21%</td>
<td>4%</td>
</tr>
<tr>
<td>UPC</td>
<td>Department of Nuclear Physics and Engineering</td>
<td>3</td>
<td>30%</td>
<td>3%</td>
</tr>
</tbody>
</table>

ICREA management data

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10 OECD Reviews of Regional Innovation: Catalonia, Spain, 2010, Fig 1.11 (page 106). This OECD figure provides the number of full-time academic staff in Catalan universities in 2004-05. While this data is a little out-of-date it is used in Figure 14 above to provide an indication (only) of the scale of ICREA Academia awardees as compared to the wider academic population. There is no data available to indicate the number of research-active academic staff in Catalan universities so a comparison of Academia Professors to the research-active academic population is not possible.
4.4.2 By discipline

The ICREAs are distributed across all five broad research disciplines (Figure 16) with the largest proportion in Experimental Sciences and Mathematics (26%). All in all, science (Experimental Sciences and Mathematics, Technology and Engineering, Life and Medical Sciences) represents 64% of all ICREA Academia Professors while Social & Behavioural Sciences and Humanities account for 36%. This distribution is broadly similar to that for the ICREA Seniors (in 2010) except for a higher proportion of Seniors in the life and medical sciences. This difference is largely attributable to the large number of ICREA Seniors in the life and medical sciences hosted by research centres (rather than universities).

Figure 16 Distribution of ICREA Professors by discipline (Academia and Seniors)

ICREA management data/ Technopolis Evaluation of ICREA

4.5 Profile of ICREA Academia Professors

4.5.1 Nationality and international experience

As would be expected from a programme aimed at tenured academics in Catalan universities the majority (94%) of Academia Professors are Spanish with the remaining 6% being other EU nationalities. Furthermore, the awardees’ CVs show that 79% undertook their undergraduate and Masters degrees in Catalunya and therefore might be expected to consider themselves Catalan. 67% undertook their PhD in Catalunya, while 9% undertook their PhD in other parts of Spain and just under a quarter outside of Spain (8% in other parts of Europe and 15% in the USA) (Figure 17).

The CVs also show that just over half of Academia Professors (54%) have several years international experience gained at post-doctoral level and/or later in their careers (Figure 18) and 42% have undertaken shorter stays overseas as visiting scholars or researchers. This type of international experience indicates that many of the awardees have an international outlook and are also highly likely to gained such posts through competitive processes, both factors that indicate they are more likely to be higher-quality professors.

Figure 17 Location of PhD studies of ICREA Academia Professors

ICREA management data (n=107)
4.5.2 Age /professional experience

The Academia programme is aimed at professors at an ‘active and expanding stage’ of their research activity and, in effect, this means that it is intended to focus the programme towards early to mid-career academics. In general these would be expected to be professors who are relatively young.

As a group, on application to the Academia programme, the Awardees had a mean age of 47, had 18 years of professional experience since gaining their PhD and the majority (64%) were already Full Professors. The remaining 36% were Associate Professors.\(^{11}\) 82% of awardees were men and 18% women, the same gender proportions as for the ICREA Seniors. Figure 19 presents the age profile of all applicants and awardees. The profiles are reasonably similar albeit with a small shift towards a younger profile for awardees compared to the profile for all applicants. However there is no statistically significant difference in the average age of applicants in the selected and non-selected group (47 years and 48 years respectively). The age profile of applicants has remained relatively stable across the four calls while the age profile of awardees differs a little with each call. In the 2008 and 2011 calls more awards to younger professors than in the 2009 and 2010 calls (Figure 20). By comparison the ICREA Seniors are on average a little younger, with a mean age of 42 and a median of 41. A further comparison can be made with the European Research Council’s support for mid-career researchers via its Consolidator Grants. These are targeted at people with 7 to 12 years experience post PhD, this would make a typical researcher they support (based on having gained a PhD in their late 20s) no more than 42 years of age on application.

Figure 21 presents the age and employment category of academic staff in Spanish universities. The employment category with the largest proportion of younger staff (TU) has 56% of academics below 49 years of age, while as Figure 19 shows that ICREA Academia receives 63% of applications and makes 71% of its awards to professors aged 50 and below. This indicates that both the applicants and awardees to ICREA Academia programme are younger than the typical profile of Spanish academics.

As the Academia programme makes no claim regards the target age group of the professors it supports, there is no right or wrong where the age profile of awardees is concerned. The average age of 47 would suggest that, in the main, the programme supports mid-career (rather early-career professors) who have 12-20 years of employment (and research) ahead of them.

A small number of interviewees questioned the ability of the programme to attract applications from what they perceived as its target audience, reporting that some of the earlier career (i.e. younger) researchers did not apply because they saw the programme as directed to well-recognised professors with a well-established track record in research.

\(^{11}\) Full professors = Catedrático de Universidad, Profesor Pleno/ Catedràtic Contractat; Associate professors = Professor Titular de Universidad, Professor Agregat
Figure 19 Age of ICREA Academia awardees and applicants

<table>
<thead>
<tr>
<th>Age on application</th>
<th>All applicants</th>
<th>Awardees</th>
<th>Unselected</th>
<th>p-value mean age of awardees/unselected*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>48</td>
<td>47</td>
<td>48</td>
<td>p=0.103</td>
</tr>
<tr>
<td>Median</td>
<td>47</td>
<td>46</td>
<td>48</td>
<td>n/a</td>
</tr>
</tbody>
</table>

ICREA management data

Figure 20 Age profile per call (applicants and awardees)

ICREA management data

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12 Age data were not available for seven applicants. These data are not represented in the figures
4.6 Quality of ICREA Academia awardees

Research quality is the main criterion for selection of Academia awardees. While quality is a difficult attribute to assess objectively we made an analysis of selected and unselected applicants in terms of the peer review scores of their Academia applications, their previous academic performance in terms of bibliometric indicators and their relative performance in winning the prestigious European Research Council grants. The aim was to determine whether the evaluation process has been effective in selecting the best research-focused professors.

4.6.1 Peer review scores

It is important to note that the peer review scores are conducted by each expert evaluator independently and are not ‘calibrated’ in any way. Therefore they only provide an indication of the relative quality of the selected and unselected applicants as determined by the international experts (and the decision process is not made entirely on the evaluators’ scores).

Figure 22 presents the average scores (mean and median) for the selected and unselected applicants for the entire set of applicants. It clearly shows that the peer review scores are higher for the selected applicants. An analysis of the scores across the universities grouped by size shows that there is no statistically significant difference in average scores for selected (and unselected) applicants by size of university.

<table>
<thead>
<tr>
<th>Average peer review score (out of 10)</th>
<th>Selected applicants</th>
<th>Unselected applicants</th>
<th>All applicants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>8.5</td>
<td>6.4</td>
<td>6.6</td>
</tr>
<tr>
<td>Median</td>
<td>8.5</td>
<td>6.5</td>
<td>6.7</td>
</tr>
<tr>
<td>Number of relevant applicants</td>
<td>107</td>
<td>1074</td>
<td>1181</td>
</tr>
</tbody>
</table>

ICREA management data
4.6.2 Bibliometric evidence

Bibliometrics analysis was conducted to compare the research performance of ICREA Academia Professors against the unselected applicants, to the selected ICREA Seniors and against the average research performance for Spain and the world.

The bibliometrics assessed the following three indicators:

- The volume of research production i.e. the number of papers published, in terms of the mean number of papers per author per year
- A proxy for the impact of research outputs, in terms of the mean value of citations per author per year
- A proxy for the quality of research outputs, in terms of quality of the journals in which articles are published (RSNIP)

The definition of each indicator and the data sources are given in Figure 23.

It should be noted that bibliometric analyses only look at one type of research output i.e. published papers in peer reviewed journals, and the scale and importance of this type of output varies with research field or domain. Peer reviewed papers are the key research output in the natural sciences, but are of less importance in other fields such as engineering where conference papers and proceedings also feature highly and in the social sciences and humanities where book chapters and monographs are more typical. There is also a bias in the publication databases towards papers published in English that may have a greater effect on papers published in the social sciences and humanities. Despite these qualifications, bibliometrics remains a useful technique for comparing research outputs and performance between groups of researchers particularly if care is taken only to compare groups of researchers in similar research domains or if the groups contain a wide range of domains.

The statistical tests have been performed on the median scores (rather than the mean scores) as bibliometric data sets typically do not follow a normal distribution. The publication performance of outliers (highly prolific authors) tends to skew the distribution considerably.

Figure 23 Definitions of the bibliometric indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOLUME of research outputs</td>
<td>The indicator is the mean number of papers per author per year.</td>
</tr>
<tr>
<td>Measured as: Mean no. of papers per author per year</td>
<td>The number of published papers recorded by an entity is contained in the Scopus abstract and citation database. An entity may be an institution, a region, a country, or a defined group of researchers such as the ICREA Academia Professors. The search process collected published peer-reviewed papers, reviews and articles plus any of the same that were in press at the time of the search (i.e. selected for publication on a known date but not yet published). Papers are tagged by author and by year. For the comparison of selected and unselected ICREA Academia applicants a comparison was made of papers (volume of publications and for the indicators impact and quality) in the time period before their application (from 1996 to the year of application). For the comparison of research outputs ‘before’ and ‘after’ the ICREA award the time lag between research activities and publication needs to be taken into account. Therefore papers were identified as ‘ICREA papers’ (that is ‘after’ the ICREA ward) if they were published at least 1 year after the ICREA Academia (or Senior) award started.</td>
</tr>
<tr>
<td>Proxy for IMPACT: Mean number of citations per author per year</td>
<td>This indicator is the mean number of citation counts per author per year is used as a proxy for the impact of the publications i.e. the extent to which the publications are referred to (and used) by other researchers. Citations for each paper (identified for the indicator above) are aggregated according to the citation window defined (see below) and an average calculated per author and per year. In counting citations per paper a citation window of five years was used (year of publication plus four years) for publications in the social sciences and humanities and three years (year of publication plus two years) for all other scientific areas.</td>
</tr>
</tbody>
</table>
| Proxy for QUALITY: SNIP is a metric defined by the bibliometricians at Centre for Science and Technology Studies at the University of Leiden. It is an indicator of the citation impact of scientific journals and is based on the citation level of an individual journal compared to the average citation level of
RSNIP

journals in the same academic discipline. Therefore it provides a source normalized approach to correct for differences in citation practices between scientific fields. The SNIP of a specific journal can then be applied to the papers it publishes.

SNIP = Source Normalised Impact per Paper.

For our analysis we use ‘RNSIP’ which is the average SNIP of the journals in which an individual researcher has published.

Data source

SCOPUS: Scopus was selected as the database indicators analysed as it has the broadest coverage in the natural science and engineering and social science domains, and is the only such database that links the authors of papers to their institutional addresses.

Scopus includes papers from 1996 onwards.

The analyses

For the analyses presented the statistical tests are applied to the median scores to address the skewedness of bibliometric data sets. Citations, for example, can be highly skewed by outliers e.g. one paper that is extremely highly cited, and therefore the median provides a better representative of the overall performance of the data set for the statistical tests.

The dataset of 107 Academia Professors was not large enough to conduct statistical tests by discipline and therefore the analysis groups all of the professors together.

For the comparison of ‘selected’ against ‘unselected’ ICREA Academia applicants a random sample of 107 was taken from the group of 635 unselected individual applicants. The unselected sample was matched to the ‘selected’ group in terms of the distribution across academic fields and the four ICREA calls.

The comparison of ICREA Academia awardees against ICREA Seniors was made for the research performance ‘before’ their applications to ICREA.

4.6.3 Bibliometric Evidence: performance of selected vs. unselected ICREA Applicants

The bibliometrics assessed three indicators for the selected and unselected ICREA Academia applicants in the years prior to applying to the programme (from 1996 onwards). The outputs (Figure 24) confirm that the ICREA selection process does indeed select the highest quality professors based on the volume, impact and quality of the publications they produce.

In all three indicators the selected ICREA Academia applicants outperformed the unselected applicants to a level that is statistically significant. Their average rate of production of publications is higher, the impact of their papers is higher and they publish in journals that have a greater impact. This demonstrates that the evaluation and selection process identifies and selects a group of higher quality academics for Academia support.

Figure 24 Bibliometric outputs prior to becoming ICREA Academia Professors (from 1996-2012)

<table>
<thead>
<tr>
<th>Bibliometric indicator</th>
<th>All research domains</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Selected ICREA Academia applicants</td>
<td>Unselected ICREA Academia applicants</td>
<td>Statistical test (on median values), p-value</td>
</tr>
<tr>
<td>Volume: mean no. of publications per author per year</td>
<td>Mean 4.87</td>
<td>3.78</td>
<td>Mean 3.78</td>
</tr>
<tr>
<td>Impact: mean no. of citations per author per year</td>
<td>Mean 5.17</td>
<td>5.45</td>
<td>Mean 3.25</td>
</tr>
<tr>
<td>Quality: RSNIP</td>
<td>Mean 1.31</td>
<td>1.26</td>
<td>Mean 1.17</td>
</tr>
</tbody>
</table>

Source: Technopolis using Scopus database. *** significant at the p<0.01 level

# For each researcher the bibliometric data covered the period from 1996 up to the point they made their application to ICREA Academia.

It is worth noting that the mean values for the ‘impact’ measure are higher for the unselected as compared to the selected applicants. This illustrates the earlier point about the tendency for distributions of research outputs to be highly skewed. In this particular case the distributions of the two groups (selected and unselected) are very different, with the standard deviation of the values for the unselected group being much higher than for the selected group.
4.6.4 Bibliometric Evidence: the performance of ICREA Academia Professors compared to ICREA Seniors

The bibliometrics assessed three indicators for the selected ICREA Academia applicants compared to a sample of 80 randomly selected ICREA Seniors. The sample was selected to match the Academia Professors in terms of research discipline and age to ensure, as far as possible, that we were not comparing groups at very different career stages. The outputs (Figure 25) confirm that the ICREA selection process does indeed select the highest quality research-focused professors based on the volume, impact and quality of the publications they produce.

Interestingly the ICREA Academia Professors outperform the ICREA Seniors in terms of the volume of publications but underperform in terms of the impact (citation levels) and the quality of the publications in which they publish. This would suggest that the group of internationally-experienced researchers recruited into the Catalan system are of higher quality than the selected Academia Professors. To some extent this is to be expected as we are comparing a group of international researchers with significant research-focused experience in some of the world’s better institutions with a group of professors in Catalan universities that not only have less international experience but have been conducting research alongside considerable teaching commitments. It will be interesting to compare research outputs once the Academia Professors have been in post for a longer period of time.

Figure 25 Bibliometric outputs for ICREA Academia and Seniors (1996–2012)

<table>
<thead>
<tr>
<th>Bibliometric indicator</th>
<th>ICREA Academia Professors (selected)</th>
<th>ICREA Seniors (selected)</th>
<th>Statistical test (on median values), p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume: mean no. of publications per author per year</td>
<td>Mean 4.87</td>
<td>Median 4</td>
<td>Mean 3.74</td>
</tr>
<tr>
<td>Impact: mean no. of citations per author per year</td>
<td>Mean 5.17</td>
<td>Median 4</td>
<td>Mean 10.75</td>
</tr>
<tr>
<td>Quality: RSNIP</td>
<td>Mean 1.31</td>
<td>Median 1.26</td>
<td>Mean 1.58</td>
</tr>
</tbody>
</table>

Source: Technopolis using Scopus database. *** significant at the p<0.01 level

4.6.5 Bibliometric Evidence: performance of ICREA Academia Professors compared to researchers in other geographical areas

The research production of ICREA Academia Professors was compared to that of researchers in Spain, Western Europe and worldwide. The analysis covered research production for the period 1996 to 2007 and assessed relative performance in terms of the average number of citations per publication for the geographical region in question.

This analysis showed that ICREA Academia Professors outperform researchers in Spain, Western Europe and Worldwide on this measure as well as the top performing European countries (Figure 26). This indicates that the programme successfully attracts, identifies and supports a group of high quality research-focused professors. The only group the Academia Professors do not out-perform is the ICREA Seniors, which is less surprising as the ICREA Seniors are a group of particularly high quality international researchers who were specifically recruited as such.

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13 We were unable to repeat an identical geographical comparison as conducted for the Evaluation of ICREA Seniors due to the lack of public access to (and the cost of creating anew) the same data on geographical performances.
Figure 26 Comparison of ICREA Academia Professors to other geographical regions (1996-2007)*

<table>
<thead>
<tr>
<th>Group/Country/Region</th>
<th>Average number of citations per publication</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICREA Academia awardees</td>
<td>23.6</td>
</tr>
<tr>
<td>ICREA Seniors</td>
<td>48.1</td>
</tr>
<tr>
<td>Spain</td>
<td>13.7</td>
</tr>
<tr>
<td>Western Europe (avg)</td>
<td>15.9</td>
</tr>
<tr>
<td>Global (avg)</td>
<td>10.9</td>
</tr>
</tbody>
</table>

**Top 5 among EU countries**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>Average citations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Denmark</td>
<td>21.2</td>
</tr>
<tr>
<td>2</td>
<td>Netherlands</td>
<td>20.8</td>
</tr>
<tr>
<td>3</td>
<td>Sweden</td>
<td>19.8</td>
</tr>
<tr>
<td>4</td>
<td>Finland</td>
<td>18.3</td>
</tr>
<tr>
<td>5</td>
<td>United Kingdom</td>
<td>18.0</td>
</tr>
</tbody>
</table>

* The measure calculates citations up to 2011 for papers published between 1996 and 2007

### 4.6.6 European Research Council (ERC) grants

Figure 27 shows that relative performance of Academia Professors in winning prestigious ERC grants. The analysis of the grants recorded on the EC’s public database shows that with seven grants awarded, the Academia Professors are disproportionately represented among ERC grant awardees. They represent just less than 1% of Catalan academics (and an even smaller proportion of all Spanish academics) but represent 25% of all ERC grants allocated to academics in Catalan universities and 4% of grants allocated to academics in Spanish universities. This further indicates that the Academia programme is attracting and selecting high quality academics and furthermore, as will be shown in section 5.3, the Academia support has also provided the time and space to apply for ERC grants.

Figure 27 ERC (starting and advanced) grants won by researchers based in Spain 2007-2012

<table>
<thead>
<tr>
<th></th>
<th>Number of ERC grants won</th>
<th>ICREA Academia awardees proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>By ICREA Academia awardees</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>By Catalan universities</td>
<td>28</td>
<td>25% of all ERC grants in Catalan universities</td>
</tr>
<tr>
<td>In Catalonia</td>
<td>73</td>
<td>10% of all ERC grants in Spain</td>
</tr>
<tr>
<td>In Spain</td>
<td>170</td>
<td>4% of all ERC grants in Spain</td>
</tr>
<tr>
<td>All ERC grants allocated</td>
<td>3,056</td>
<td>0.2% of all ERC grants allocated</td>
</tr>
</tbody>
</table>

Technopolis, based on the ERC database in Cordis (http://cordis.europa.eu/)

### 4.6.7 Interviews

The interviews with senior university staff (and with unselected applicants) indicate that there is general agreement that the programme selects highest quality research-focused professors in their institutions. No-one was surprised or concerned by who is selected, although there are some queries as to why certain individuals are not selected for funding.
5 Outputs

ICREA does not systematically collect data on Academia Professors’ outputs in the same way as it does for ICREA Seniors. ICREA Staff report that this is due to the different relationship they have with the Academia Professors. For the Seniors they are the employer and so are able to request output data but for the Academia Professors they provide a supplementary award to academics employed by universities and therefore they feel they have no ‘right’ to request such data. The data reported here have been collected via the survey of Academia Professors, interviews with awardees and senior university staff, plus some analysis of publications using the database compiled for the bibliometrics.

5.1 Intensifying research activity

Enabling Catalan university professors to spend more time on research is the direct operational objective and first direct output of the ICREA Academia programme. Academia Professors report it as the most important motivation for applying to programme (Figure 3 and Figure 4), closely followed by the closely related factors ‘opportunity to expand their research activities’ and ‘access funding for research’. It is therefore a very important feature of the programme as the awardees and senior university staff report that there are few opportunities within the university system to decrease the teaching load in order to focus on research.

92% of survey respondents reported that ICREA Academia has enabled them to reduce their teaching load and spend more time on research (Figure 28), with two-thirds strongly agreeing with the statements to this effect, and 81% report the benefit of receiving direct funding for research. Very few respondents report a reduction in administrative responsibilities or any additional research funding from their university.

The additional time spent on research is significant. Figure 29 shows that Academia Professors significantly increased the time spent on research after gaining the award. Before the award 48% of people spent between 50% and 75% of their time, and 37% below 50% of their time on research. After gaining the award 80% were spending more than 75% of their time on research and a quarter of these were devoting more than 90% of their time. Overall 91% of the survey respondents have experienced an increase in the time spent on research and in this respect the programme has fulfilled its key operational objective. Furthermore, 90% of survey respondents reported that the award had entirely met, or more than met, their expectations.

The interviews show that awardees utilise their ICREA funding to hire staff (typically contract Associate Professors or Research Assistants) to lighten their teaching load and/or to hire PhD students or post-docs to assist with their research. Funds are also used to support travel to conferences and collaborations with overseas research groups. The awardees particularly value the flexibility to use the funding as they see fit, a quality unlike any other form of research funding except perhaps the ERC grants. However they also point out that funding is limited; the €20k assigned to research/ teaching buy-out is not enough to support one person full-time. A small number of awardees reported using their personal Academia funding (i.e. the salary supplement) to support international travel and visits.

The benefits of having a reduced teaching load however exceed a simple increase in the time spent on research. ICREA Academia Professors report the importance of gaining flexibility and control over their time. This benefits their research production as it provides more time to plan and implement longer-term programmes of research and guide a research group and, particularly for younger professors, to develop and lead their own programme of research rather than working within another person’s research programme. Equally important, it also offers more opportunities to develop and extend their professional networks, particularly internationally, through attending conferences, visiting other research groups, participating in research committees and editorial boards etc, plus it provides time to bid for additional research funding.
5.2 Research achievements

Academia Professors report a wide range of research achievements as a result of their Academia award. The most significant achievements are reported to be supporting and developing junior academics, improving the visibility of their research within Catalunya and an increase in publications, closely followed by an increase in publications in high impact journals and the growth of research groups.

Also reported (but to a slightly lesser extent) are the visibility of their research in Spain and internationally and the ability to attend and participate in more research events (conferences etc.). Interestingly in terms of research collaborations the greater effect is on international collaborations rather than in Catalunya or the rest of Spain. The least significant achievements were in establishing new research groups, winning other awards and prizes and technology transfer.

These results are what would be expected due to the increase in time available for research. It is important to note that awardees are not simply supporting themselves but are investing time and research funds in developing their research group and supporting junior academics. The interviews with Academia Professors revealed that funding not used to buy-out teaching time is typically devoted to hiring and supporting PhD students or post-doctoral researchers. Therefore, albeit to a
small extent, the ICREA Academia programme is making a contribution to the lack of funding support for the most junior researchers in Catalunya.

The increased visibility and recognition of their research within Catalunya is important, with many awardees reporting the value of an external independent evaluation of their research and the prestige attached to being selected for an ICREA Academia award. This gives them important recognition within their university but also more widely due to their ability to play a larger role in international research networks.

Appendix C provides examples of the types of significant achievements reported by Academia Professors.

Figure 30 Research achievements (ranked by proportion of scores of 1 & 2, presented as percentage of all respondents)

### What have been your major research achievements as an ICREA Academia awardee? (1 denotes significant achievement, 5 denotes minor achievement)

1. I have established a new research group
2. I have won other awards or prizes
3. I have been able to exploit the outputs of my research and to conduct technology/knowledge transfer activities (e.g. patents)
4. I have increased my participation in collaborative research projects within Spain
5. I have increased my involvement in research stays at other universities or research centres
6. I have increased my participation in collaborative research projects within Catalunya
7. I have increased my participation in international collaborative research projects
8. I have increased my participation in conferences, organisation of conferences or congress
9. I have grown and developed my research group
10. The visibility and reputation of my research has increased internationally
11. The visibility and reputation of my research has increased in Spain
12. The visibility and reputation of my research has increased internationally
13. My publication output has increased
14. My publications in high-impact journals have increased
15. I have improved the visibility of my research and research reputation in Catalunya
16. I have supported and developed junior researchers (e.g. supervised masters and PhDs and supported post docs)

#### Technopolis, Survey of ICREA Academia Professors, n=103

### 5.3 Research funding

Two-thirds of survey respondents report that they have secured additional funding for their research since gaining the Academia award. The majority of this has been gained from Spanish public sources (reported by 45% of respondents), followed by international sources such as the EU, the private sector, Catalan public sources and internal university funds (Figure 31).

Survey respondents were asked to provide values (or estimates) of their average annual funding for the three years prior to the Academia award and the figure for the most recent full calendar year since the award. 84% reported figures and of these 67% reported an increase in funding. For all
respondents who reported figures, the total change in annual funding was an increase of €7.9M\textsuperscript{14} (57\%) from €13.9M to €21.8M (Figure 32). This is an average of just under €100k per researcher who reported figures, or €74k if all Academia Professors are included. However, it should be noted that this latter figure will underestimate the average increase in funding per professor as those selected in the more recent calls will have had less time to bid for and win new research funds. This is illustrated in Figure 33 and Figure 34. A higher proportion of the 2008 cohort of Academia Professors (i.e. those awarded as a result of the 2008 call) reported an increase in their ability to attract additional funding (see Figure 34) and the increase in annual funding progressively decreases from €196K for the 2008 cohort to €32k for the 2011 cohort. However time is not the only factor. We can for example observe a clear reduction in those reporting an increase in funding from Spanish sources after the 2009. It can be presumed that this is a result of reductions in public funding due to the economic situation.

The largest increase in percentage terms is in funding from the European Union which has almost doubled from a total funding of €4.06M to €7.8M, illustrating that Academia Professors have increased their ability to bid for and win European funding. In addition, 10 awardees report winning an ERC grant since their Academia award this is larger than the number reported in section 4.6.6 and might reflect the outputs of the latest round of ERC awards. The interviews with award holders suggest that most of these have been bid and won since the Academia award as it provided the time and the confidence to bid. A small number of awardees bid for ERC and ICREA Academia at the same time and were successful in both.

Figure 31 Changes in research funding

\textsuperscript{14} This figure includes researchers whose funding decreased for the years in question.
Figure 32 Changes in annual research funding

Figure 33 Change in annual funding per Academia call

<table>
<thead>
<tr>
<th>Academia call</th>
<th>Total change in funding</th>
<th>Mean change in funding (per researcher reporting a change)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>6,263,533</td>
<td>€195,735</td>
</tr>
<tr>
<td>2009</td>
<td>1,002,434</td>
<td>€52,760</td>
</tr>
<tr>
<td>2010</td>
<td>597,397</td>
<td>€23,119</td>
</tr>
<tr>
<td>2011</td>
<td>32,000</td>
<td>€3,200</td>
</tr>
<tr>
<td>Total</td>
<td>7,895,364</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Technopolis, Survey of ICREA Academia awardees, n=83
N.B. this includes reported decreases as well as increases

Figure 34 Changes in annual research funding per Academia call

5.4 Quantity and quality of research outputs

The main output of research is publications – papers and articles in peer reviewed journals, monographs, books and book chapters etc. However there is a time gap between conducting research and publishing results and for the majority of Academia Professors it will be too soon to see a strong effect in publications. Therefore we looked at evidence from a number of directions, self-reported effects collected by the survey and interviews of the Academia Professors (Figure 30), the bibliometric evidence and an analysis of the sample of awardees’ CVs.

The Academia Professors report a distinct impact on the quantity and quality of their research. 96% of survey respondents reported an increase in publications as one of their research achievements with 73% of all respondents identifying this as a significant achievement (a score of 1 or 2 in Figure 30) and 67% have reporting an increase in publications in high-impact journals as their most significant achievements. The interviews mirror the survey with all interviewees reporting an increase in the quantity and quality of their research outputs as a result of having more time not only to conduct research but also to plan and design high-quality, and sometimes riskier, research. Many report that they have finally been able implement research ideas that they had been deliberating over for some time previously. They also have had time to improve research quality through engaging in more research collaborations with international colleagues and peers.

It is rather soon to be testing for any effect in the bibliometric data as most Academia Professors have not been in post long enough for an effect in terms of quantity and quality to be discernable. Therefore bibliometric analysis was conducted for the Academia awardees from the 2008, 2009 and 2010 calls only. For this analysis papers were identified as occurring ‘after the ICREA Academia post’ if they were published at least one year after the award was made. In this type of analysis the bibliometric indicators are calculated for the same authors before and after their ICREA Academia award, and the indicators are then calculated per paper rather than per author. This type of test violates the usual assumption that the two groups being compared are independent of each other. The impact of this violation being a reduced ability to detect statistically significant differences between the two groups.

The bibliometric data presented in Figure 35 reveals no statistically significant difference in the performance of ICREA Academia Professors before and after their award in terms of the impact (citation level) of their research outputs. However there appears to be some positive effect in terms of quality, i.e. the awardees are publishing in higher impact journals than previously. Ideally the bibliometric analysis would be repeated once a longer ‘citation window’ has passed to allow for a more robust test of impact via citation effects.

In terms of the volume of publication, an analysis of a sample of the 2008 cohort reveals that the output levels tend to vary annually, although there appears to be a small upward trend, in particular a large increase in publications in 2012. There is also an increase in the number of papers published in English. It will be important to see if these trends continue in the coming years.

Figure 35 Bibliometric outputs for ICREA Academia Professors before and after their award

<table>
<thead>
<tr>
<th>Bibliometric indicator</th>
<th>BEFORE ICREA Academia award</th>
<th>AFTER ICREA Academia award</th>
<th>Statistical test (on median values), p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Impact:</strong> mean no. of citations per publication per year</td>
<td>Mean 6.13</td>
<td>Median 4</td>
<td>Mean 6.22</td>
</tr>
<tr>
<td><strong>Quality:</strong> RSNIP</td>
<td>Mean 1.31</td>
<td>Median 1.21</td>
<td>Mean 1.47</td>
</tr>
</tbody>
</table>

Source: Technopolis using Scopus database. ** significant at the p<0.05 level
5.5 New responsibilities and recognition

The Academia programme has had little effect on the career progression of awardees in terms of their formal academic grade. While nearly a quarter (24%) of survey respondents report that their academic grade has improved since the Academia award, 64% of survey respondents report that their academic grade has not changed. The remainder expect some change in the near future. This is not altogether surprising as the majority (64%) are already Full Professors, so there is little scope for further progression. For the Academia awardees that are Associate Professors the issue of lack of progression is related to the lack of positions available, a situation exacerbated by the effect of the economic situation in Spain on public sector finances. In fact several report that they already qualify for the Catalan Contractat Professorship but that there are no positions available. However as research activity is one factor in gaining a full professorship, the awardees expect the award to be helpful in achieving it in the future.

The ability to dedicate more time to research has enabled 60% of awardees to acquire new leadership responsibilities (Figure 37). In most cases this is new leadership responsibilities in their research team (32% of all respondents) followed by new leadership responsibilities in their department and for 10% new responsibilities within the university. Academia Professors value highly the independent recognition of their research provided by ICREA, and the subsequent internal recognition and raised profile it gives them within their university. It helps to mark them out as academics with important insight into the research process and/or as potential future research leaders. In addition, one university Vice-Rector reported that the input of Academia Professors would be useful to the development of institutional research strategies.

Finally, 30% of Academia Professors report external recognition of their work by being made a fellow or member of a prestigious institution and/or receiving another form of significant honour or award.

In both the case of new leadership roles and prestigious awards the majority of awardees feel that ICREA has played a role, mainly due to the ability to conduct more research but also in terms of increased visibility – internal to the university by virtue of holding an award and externally due to increased participation in international activities and networks.
5.6 Disadvantages of the ICREA Academia award

Academia Professors were asked if there were any significant disadvantages to the award. The majority, nearly 90%, reported no disadvantages. Those who did report disadvantages noted that the disadvantages they reported were in their opinion, relatively minor issues. They included: a level of resentment among colleagues, though this was only reported by 4% of respondents; universities not honouring the reduction in teaching load (3%) and a concern about their future after the award comes to an end (3%). Interviews also highlighted that Academia awardees with senior management/administrative duties such as head of department, dean or vice-rectors have limited teaching duties but unable to reduce their administrative duties to release time for research.

The interviews demonstrated that there is a much wider concern about their future after the award ends. In most cases the concern was centred on the issue of a return to high teaching load and the corresponding reduction in time for research. The ability to conduct research is extremely important to the professional lives of this group of academics and the concept of a return to near full-time teaching is highly problematic for them. Many report an intention to try to maintain the level of research activity, making use of their PhD students and post-docs for example, but they also acknowledge that with a full teaching load their research levels will inevitably reduce. The Catalan (and Spanish) university employment system is highly inflexible and offers no automatic right to increased research time (and by extension a reduction in teaching duties) to professors who secure external research income. However a number of universities are starting to make small shifts in the balance of teaching and research in specific cases. UPC for example reduces teaching duties for professors awarded ERC grants or Framework Programme coordinator roles and UB is considering a similar approach.

The issue of an effective salary reduction once their award ends appeared to be of lesser concern to the awardees. None of the professors seemed aware that there is the ability to re-apply to the Academia programme a second time.
6 Outcomes and impacts

6.1 Retention of high-quality university professors in Catalunya

Academia Professors already have tenure at a Catalan university, a position that tends to render academics in any country less mobile, except for the very best research academics who can command attractive job offers (in terms of salary, research equipment, research staff etc.) and/or in countries where tenure does not exist. The interviews with Academia Professors demonstrate that the majority of them have followed a very traditional path for Catalan (and Spanish) academics, that is conducting their undergraduate, masters and PhD studies close to home, going overseas for one or two post-doctoral positions (and in some cases for their PhD) and returning to Catalunya, almost always to the institution at which they studied, to take up an academic position leading to tenure. The vast majority of ICREA Academia awardees are Spanish, would consider themselves to be Catalan and had already made the decision to return to Catalunya to continue their academic careers. A large proportion of the Academia Professors made use of the national Ramon y Cajal programme, designed to encourage a high-quality academics to return to Spain, to return to the region. ICREA Academia awardees are therefore fairly typical Spanish academics in the sense that they tend to work at the university from which they graduated. Nevertheless they are not ‘standard’ academics in the sense that they have endeavoured to be research-focused academics in a system that does not particularly recognise or reward research activities and research excellence. They are high-quality professors within the Catalan university system and so have more potential to be mobile than others in the system.

Evidence for the impact of the Academia programme on retention is mixed. Around a half of survey respondents reported some influence of ICREA Academia on their career plans while 32% reported that ICREA had no influence on their career plans (Figure 38). The remainder neither agree nor disagree with statements about career plans. The largest effect was in terms of influence on the decision to remain in Catalunya rather than seeking a research position abroad (reported by 38%), followed by influence on the decision to seek positions in other forms of research institution (27%). Interestingly the effect on retention as regards the rest of Spain is much lower, suggesting that when people seek to move it is overseas rather than within Spain. However, a smaller number of survey respondents (26%) were considering a career move at the time they applied for the award, suggesting that most academics were not weighing up alternative offers at the time they applied and therefore that their motivations were focused on other features of the award. The interviews with selected and unselected applicants reinforce this finding and suggest that the retention effect is perhaps even more limited. None of the selected applicants report that they would have left their positions in Catalunya without the award and while one of the unselected applicants has since left Catalunya he was a non-Spanish academic who returned to his home country. The rest of the interviewed unselected applicants remain in Catalunya. Many interviewees reported that they have strong family ties to Catalunya as well as a tenured position that they are reluctant to give up. It is interesting to note that in the interviews, while awardees admit there was no retention effect for them personally, they expect that the programme has helped to retain other Academia Professors, though we interviewed no person for whom this was definitely the case.

In general, while the Academia Professors like most Catalan academics are not particularly mobile, as a group of the higher quality academics in the region they are potentially relatively more mobile than a typical Catalan Academic. Senior university staff reported that in certain research fields with high demand, such as Information and Communications Technology, staff are relatively more mobile and some academics have received offers from overseas institutions. This was the case for example for academics at UPF who generally have a more international outlook and as a result access to wider international networks from which opportunities might arise. Furthermore, one of the smaller universities reported that for it the key feature of the Academia programme is the ability to retain high quality professors, who are a challenge to keep, and so maintain their ‘pockets’ of research excellence.

Another point made by a number of awardees was the need to retain research-focused academics in the university system and not lose them to the research institutes, CERCAs in particular, where they can concentrate on research full-time.
6.2 Building and developing high-quality research groups

Increased funding both from the ICREA programme itself and the external funding described above enable the awardees to develop and grow their research groups.

Survey respondents were asked to provide details of the number of research staff (full-time equivalents) in their group before and after (as of 1 October 2012) the ICREA Academia award. Some 87% of the survey respondents were able to provide data and of these 86% reported an increase in group size. In addition 16% reported that they had established a new research group. The average group size has increased from 9.4 to 13.7 staff, an increase of 46%. The largest increase was in the number of PhD students, followed by post-doctoral researchers, with all but one respondent reporting an increase in these junior academics; while just under half (44%) report an increase in the number of senior academics. Furthermore, the degree of internationalisation has also improved with 62% of those reporting an increase in group size also reporting an increase in the number of non-Spanish academics in their group. The average proportion of non-Spanish academics in each research group has increased from 22% to 29%. This suggests that the international reputation of the groups is growing.

Technopolis, Survey of ICREA Academia awardees, n=103
6.3 Internationalisation of research

Research is an international endeavour and it is important that there is not just a growth in research activity Catalunya but that the research is part of the international efforts in any particular field.

59% of Academia Professors report that the award has had a large impact in terms of increased collaboration with international research groups (Figure 42 in section 6.4). This can also be seen in internationalisation of research as measured in terms of the publications co-authored with non-Spanish researchers (Figure 40).

As reported above the interviews highlight the effect of the award in providing more time to engage with international colleagues and peers alongside more time to bid for international projects, particularly via the European Framework Programme. Figure 41 shows the source countries of the most frequent research collaborators (in terms of co-publications). The USA is the common partners, followed by the four large European countries (all EU Member States) and a number of other smaller European countries plus countries in South America. In addition, the largest increase in research funding reported by awardees was from international sources (including EU) (Figure 32). The interviews also indicated that a key change enabled by the Academia award is the ability to take a larger role in European projects due to the extra time available, so leading and/or coordinating projects rather than simply being a project participant.

Figure 40: International collaboration for ICREA Academia Professors before and after the award

<table>
<thead>
<tr>
<th>Percent of international co-authorship</th>
<th>BEFORE ICREA Academia award</th>
<th>AFTER ICREA Academia award</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008 &amp; 2009 cohorts - 3 years before &amp; 3 years after ICREA award</td>
<td>3.6%</td>
<td>9.1%</td>
</tr>
</tbody>
</table>

Figure 41: International Partnerships (for authors with more than 50 peer reviewed publications)

<table>
<thead>
<tr>
<th>Co-authored with</th>
<th>Number of Publications</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>648</td>
<td>20%</td>
</tr>
<tr>
<td>Italy</td>
<td>310</td>
<td>9%</td>
</tr>
<tr>
<td>Germany</td>
<td>299</td>
<td>9%</td>
</tr>
<tr>
<td>France</td>
<td>288</td>
<td>9%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>247</td>
<td>8%</td>
</tr>
<tr>
<td>Portugal</td>
<td>135</td>
<td>4%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>134</td>
<td>4%</td>
</tr>
<tr>
<td>Mexico</td>
<td>123</td>
<td>4%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>123</td>
<td>4%</td>
</tr>
<tr>
<td>Brazil</td>
<td>122</td>
<td>4%</td>
</tr>
<tr>
<td>Canada</td>
<td>108</td>
<td>3%</td>
</tr>
<tr>
<td>Argentina</td>
<td>106</td>
<td>3%</td>
</tr>
<tr>
<td>Poland</td>
<td>88</td>
<td>3%</td>
</tr>
<tr>
<td>Belgium</td>
<td>76</td>
<td>2%</td>
</tr>
<tr>
<td>India</td>
<td>65</td>
<td>2%</td>
</tr>
<tr>
<td>Finland</td>
<td>62</td>
<td>2%</td>
</tr>
<tr>
<td>Sweden</td>
<td>58</td>
<td>2%</td>
</tr>
<tr>
<td>Greece</td>
<td>56</td>
<td>2%</td>
</tr>
<tr>
<td>Israel</td>
<td>55</td>
<td>2%</td>
</tr>
<tr>
<td>Austria</td>
<td>54</td>
<td>2%</td>
</tr>
<tr>
<td>China</td>
<td>54</td>
<td>2%</td>
</tr>
<tr>
<td>Chile</td>
<td>53</td>
<td>2%</td>
</tr>
<tr>
<td>Total</td>
<td>3264</td>
<td>100%</td>
</tr>
</tbody>
</table>

Technopolis, using Scopus
6.4 Wider impacts

The impacts of ICREA Academia are expected to extend beyond the individuals supported to their research departments, university and ultimately to the wider Catalan research system in terms of improved research performance. The wider impacts generally take longer to take effect the further as, in an organisational sense, they are from the initial investment. Again, the programme has only been in existence for four years and so wider effects are more difficult to discern. In addition the Academia Professors are a very small proportion of the total number of Catalan academics and as such there is a limit to their contribution to wider effects. Qualitative evidence was gathered from Academia Professors and senior university staff about wider impacts on the departments and universities where Academia Professors are based and on the Catalan research system as a whole.

6.4.1 Impact on participating universities

Two-thirds of Academia Professors report a large impact on the quality of research conducted in their department and on the research reputation of the department/university. Further large impacts reported include increased international collaborations (59%), attraction of high-quality researchers to join the department/university (44%) and positive changes in the research behaviours and outputs of departmental/university colleagues (37%). This latter point was reflected in the interviews with awardees and senior university staff. Like the ICREA Seniors the Academia Professors set a standard for conducting research and to some extent ‘raise the game’ for those around, especially for those who would like to apply to the programme. A particular example of the influence on the activities of colleagues was the hosting of an international research conference, organised by an Academia Professor, in the region. As an international event, the conference and its proceedings were entirely in English, forcing departmental colleagues to submit papers and present in English. Since that time, not only have new collaborations started, but the department has more confidence in participating in international events, fora, journals, etc. in English.

Interviewees note that many Academia Professors are already in the better performing departments and so there is a limit to their effect. Nevertheless, they take the view that the Academia Professors help to raise the profile of existing high quality research groups/departments, a feature that, within an academic culture of equality, is useful as, as one interviewee put it “external recognition leads to internal recognition”.

The unselected applicants report a strong motivational effect as they seek to improve their research outputs in order to re-apply to the programme in future. With around 1,000 unselected applicants this could lead to significant improvements in the overall level of research.
6.4.2 Impact on the Catalan research system

The Academia Professors take the view that the programme has had a strong impact on the wider Catalan research system. More than 90% agree (and 50-60% agree strongly) that the programme has contributed to improvements in the reputation, quantity and quality of Catalan research, and 81% that it has improved the content of Catalan research. 81% believe that the programme has helped retain high quality professors in the system. This is a somewhat high figure with respect to the responses to the direct question of retention reported in section 6.1, although as described in that section the interviews suggest that individuals tend to think that the programme has influenced others (but not themselves) to remain in Catalunya. There may some optimism in the responses here, as while improvements from more research activity will have been made, the Academia Professors make up less than 1% of the total academic workforce so their impact is ultimately limited. Nevertheless the areas where individual awardees have seen improvements in their own practice will have made a contribution to wider improvements.

Perhaps more important, a large proportion of the professors (more than 50%) feel that there has been an impact in terms of stimulating change in the research strategies and practices in Catalan universities and wider change in the recruitment and career development practices in Catalunya. This is borne out by the interviews where there is a strong view that the Academia programme helps to stimulate change by leading by example. It has put in place new recognition and reward practices for academics that challenge the higher education system; practices that demonstrate that research can be a full-time academic activity, that departments can accommodate awardees who concentrate on research and that research excellence can be rewarded regardless of age or seniority. The implementation of these new practices has created some frictions and teething problems but they do not appear to have been insurmountable. There is widespread acknowledgement that ICREA Academia (or ICREA more generally) cannot by itself bring about fundamental change in a system based on legal structures and long-standing tradition but it is able to start to show the way and demonstrate that universities can offer and accommodate different career patterns and paths. Interviewees note that a recent change in Spanish law will enable reduced teaching for some academics but that it will not come into force for another six years. Closer to home, the UPC has an internal process that enables a reduction in teaching hours for academics coordinating EC projects and UB report that they are considering how to offer different options for academics to balance teaching and research, potentially offering anything up to a 50:50 split of teaching and research.
Figure 43 Impact on the Catalan research system

7 Conclusions and Recommendations

This section presents the conclusions against each of the evaluation questions in turn.

7.1 Does the activity of ICREA correspond to needs in the Catalan research system?

The ICREA Academia programme responds to a well-identified need in the Catalan higher education research system. The ability of Catalan universities to support research-focused academic posts and careers paths and to implement merit-based reward and recognition systems is severely limited by the traditional university structures, employment practices and customs. These constraints are based on legal, institutional and cultural factors such as national employment laws and regulations for public servants, the historical role of the university as primarily an educational institution and a culture of equality among academics. As a result, academic careers are centred on teaching and the majority of professors’ time, regardless of seniority or research skills is assigned to teaching duties. There is limited flexibility to enable individuals to shift their work balance towards research and limited scope to reward high quality research-active academics particularly those in the earlier stages of their career. These factors impede the effectiveness of the Spanish research system. High quality research is an intensive endeavour that not only requires sufficient time to conduct research but also time to engage in international networks that facilitate the flow of knowledge and skills between researchers and research groups.

The ICREA Academia programme provides a mechanism to enable existing high quality research-active professors in Catalan universities to hold a research-focused position for a fixed five-year term. First and foremost by providing funding for additional teaching staff and/or junior research staff, the Academia award enables professors to intensify their research activity. In addition, ICREA Academia provides a highly visible example of a merit-based recognition and reward system through its selection processes and the salary supplement. In common with its principal Senior Professors programme, ICREA’s open calls for applicants administered outside of university hierarchies and its selection processes based on performance and international peer review not only demonstrate how such a system works in practice but has publicly identified and supported a group of highly research active academics in the Catalan university system.
Whether ICREA Academia is needed in order to retain high quality research-focused professors in Catalunya, the evidence is less clear-cut. While Academia Professors would appear to be on average a little more mobile than typical Catalan academics, they are not as a group particularly mobile. There was not strong evidence that they were being lost in large numbers to the system prior to the programme’s introduction. However, there is a growing opinion that retention may become more of an issue in the future as a result of the economic situation in Spain, particularly the salary cuts at public universities and a reduction in public research budgets, and therefore the programme may become more relevant to the retention of high quality professors in the coming years.

7.2 What is the quality of the research-focused professors ICREA has provided?
The ICREA Academia selection process is effective in selecting the highest quality candidates among the applicants and the interview, bibliometric and ERC data would suggest that those selected represent the better research-active professors within the Catalan system. The ICREA Academia Professors outperform the ICREA Senior Professors in terms of the volume of publication but underperform in terms of the impact (citation levels) and the quality of the publications in which they publish. This suggests that the group of international researchers recruited into the Catalan system as ICREA Seniors are of higher quality than the selected Academia Professors. To some extent this is to be expected as we are comparing a group of high quality international researchers with significant research experience in some of the world’s best institutions with a group of Catalan professors that not only have less international experience but until their Academia award had been conducting research alongside considerable teaching commitments. A fairer test will be to compare research outputs once the Academia Professors have been in post for a longer period of time.

7.3 Has the programme led to the retention in Catalunya of good research-focused professors who would otherwise have left?
The evidence for the impact of the Academia programme on the retention of professors is limited. The professors supported by Academia already have tenure at a Catalan university, a position that tends to render academics in any country less mobile. The vast majority of ICREA Academia awardees are Spanish and would also consider themselves Catalan and they have already made the decision to return to Catalunya to continue their academic careers. In this sense they are fairly typical Spanish academics and while they may be more mobile than most, there is limited evidence that a significant proportion of them would be based elsewhere without the Academia award. At most perhaps a quarter might have more actively sought or considered positions overseas (in particular) without the award. However there is some evidence that there may be a greater retention effect on smaller universities where the Academia award can help to retain staff in research niches in which the university excels rather than lose them to more prestigious institutions.

7.4 What have the effects been on the research of ICREA Academia Professors?
The supported professors have significantly intensified their research activities, are developing and growing their research groups and winning more research funding. A key aspect of the programme is the additional time available, not only for conducting research but also for preparing research proposals and more active participation in international research communities. In addition the autonomy resulting from the funding, and the prestige associated with it, are often decisive factors in the development of independent research portfolios and reputations for the early-career awardees. All of these factors generate more opportunities for research, international collaborations and raising the profile of the individuals but also their universities and the Catalan research system. The awardees report a wide range of positive effects on their research outputs (both quantity and quality), their ability to support junior research-focused academics and build large research teams. The additional time available means that the professors can play more active roles in collaborative projects and international activities such as leading bids and/or coordinating European projects and hosting conferences. As the programme only started four years ago, it is too early to observe impacts on the quantity and quality of research outputs in the bibliometric data. There are some indications that the volume of research outputs is starting to increase but this needs to tested again in 4 or 5 years time.
In addition to the funding to release time for research, the personal prestige and external recognition of their research bestowed by the ICREA Academia award is a strong motivator for the professors to prioritise research over their other duties and to improve the quantity and quality of research outputs. The salary supplement is seen as an additional component of the external recognition of the award but in general, it appears to be of less influence than the availability of time for research and the public recognition of an individual’s quality.

7.5 What have the effects been on research in the participating universities?

The Academia programme has enabled universities to gain external recognition of their areas of research excellence. While many of the professors and their research groups were already recognised as high quality by university senior staff this was not the case for all individual professors. Therefore the programme has helped to put individuals and their groups ‘on the map’ in Catalunya and in Spain to some extent, although the programme is less known to an international audience. There has also been a motivational effect on a proportion of the unselected applicants and on colleagues who aspire to be awarded an ICREA Academia in future.

Since Academia is an open programme to which applicants apply directly, the universities have had no option but to implement new practices in the allocation of academic duties between teaching and research in order to accommodate the Academia awardees. While this created teething problems and some bad feeling among colleagues, for the most part awardees have been accommodated and for the more recent applicants most of the challenges have been overcome. Therefore the programme has led universities into trying new models for academic resource allocation and, along with other related policy measures in Catalunya, appears to be starting to stimulate a change in thinking at all universities.

In terms of directly raising the quantity and quality of outputs of the Catalan research system, it is likely that the effects will be marginal. ICREA Academia supports less than 1% of the academic population and the additional funding for research is relatively small. The more important impact of the programme is its influence on changing university culture as new practices are implemented, albeit on a fairly small scale, across all universities in the system.

7.6 Has the funding led to sustainable changes in the Catalan research system?

ICREA Academia has created important benefits within the research system. In addition to intensifying the research activity among a small group of the region’s better research-focused academics, it is contributing to an emerging mind-set that is much more favourable to a university system that recognises and values academic research careers and a system that is based on openness, merit and international excellence. Along with ICREA support for Senior Professors the Academia programme is playing an important role in persuading and enabling universities to experiment with different patterns of resource allocation and different academic career models and, by doing so, demonstrating that the system can adapt and can accommodate different work patterns and career options.

However, ICREA alone cannot create sustainable behavioural or systemic change in the Catalan research system not only due to its relatively small scale but also due to the legal constraints at the national level, in particular those related to the terms and conditions of academic employment in public universities. ICREA’s strength is in its ability to influence changes in mind-sets and culture by leading the way and demonstrating by example that change in the research system is possible and beneficial. But, as for the ICREA Senior programme, ICREA Academia provides a way to circumvent the existing rigidities in the research system and it is important that the experiments instigated by ICREA stimulate other actors in the system to take up the challenge of driving longer-term improvements in the system. ICREA Academia should not become a permanent but essentially ad-hoc and small-scale solution to the constraints in the research system.

7.7 Should ICREA’s strategy change?

The problems in the Catalan research system that ICREA Academia seeks to overcome still remain and therefore there is a role of ICREA Academia. Furthermore, while to date the evidence for a problem of retaining high-quality academic professors has been limited there is every expectation that this issue will grow in importance in the coming years as a result of the economic crisis. Therefore the programme meets a need in the Catalan research system and is likely to continue to
do so for the foreseeable future. Therefore there is no need for ICREA to fundamentally change its strategy with respect to the Academia programme. We recommend that the programme is continued. Nevertheless there are a number of improvements that could be made.

7.8 Recommendations

Clarify the next phase of the ICREA Academia programme
As the first professors are approaching the end of their Academia awards, there is considerable concern as to their future with respect to continued access to support from ICREA. At the same time, ICREA is quite clear in private that award holders will be able to re-apply for support in competition with new-comers. We recommend that ICREA work quickly to publicise their guidelines/rules for re-application and implement a process that ensures that future calls enable existing/previous Academia Professors to re-apply alongside new-comers, keeping a strong focus on selecting only the very best professors for support.

Consider adjusting the financial model
The most important aspect of the Academia award, in terms of both its attractiveness to applicants and impact, is the funding that provides more time for research (i.e. funding additional teaching and/or research staff), while the salary supplement appears to be of less importance. Therefore there is an opportunity to adjust the Academia financial model. This might entail, for example, a reduction in the salary supplement (and so releasing funds for either more awards or longer awards) or a more flexible approach to the use of the funding, such as allowing each awardee to choose how to allocate the funding between direct support for research and the salary supplement. However, as already noted, in the current economic the salary supplement may become more important and therefore any change to the model is likely to be somewhat contentious. Therefore we recommend that ICREA consider adjusting the financial model of ICREA Academia and that it conduct a consultation process with current ICREA Academia Professors (and possibly the current applicants to the programme) to identify their views on possible alternative models.

Consider sub-dividing the programme to support different career stages
To ensure the programme is able to support high quality research-active professors at various stages of their career, ICREA should consider adopting an approach similar to the ERC whereby the programme is sub-divided into different categories based on the number of years experience post-PhD. This would not only result in a selection process that assesses professors with similar levels of experience but would allow the Catalan Government (or ICREA) selectively to support different career stages, in pursuit of policy to meet Catalunya’s needs, by adjusting the balance of funding between different sub-programmes.
Appendix A Evaluation Interviewees

Provided under separate cover.
Appendix B Survey questionnaire addressed to ICREA Academia Awardees

## Evaluation of ICREA Academia

### Introduction

**This questionnaire survey**

This survey is part of the evaluation of the ICREA Academia programme being performed by Technopolis on behalf of ICREA. It seeks to capture the views of the ICREA Academia awardees, in terms of their experience, the impact of the programme on their career and wider benefits within the Catalan university and research system.

When answering the questions, we ask that you respond from your personal perspective. All individual answers and comments will be treated as strictly confidential and non-attributable. The survey results will be reported to ICREA in aggregate form only.

The survey questionnaire comprises closed questions (with ‘tick-box’ response options) plus open questions to allow you to provide more detailed information. We estimate that it should take around 20 minutes to complete.

**Important information**

Your answers will be saved automatically, and you can leave the questionnaire at any time and return to it later via the URL. If you are unable to or do not wish to answer any of the questions please leave these blank and move on to the next question.

If you have any questions or comments about the survey please do not hesitate to contact us via email on: flora.giarracca@technopolis-group.com
If you have any queries for ICREA with respect to the evaluation please contact Sònia Salvadó on: ssalvado@icrea.cat

Thank you in advance for your participation.
# Evaluation of ICREA Academia

## About you

1. **Could you please provide us with the following information.**

<table>
<thead>
<tr>
<th>Field</th>
<th>Input Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Name</td>
<td></td>
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<tr>
<td>Last Name</td>
<td></td>
</tr>
<tr>
<td>Job Title</td>
<td></td>
</tr>
<tr>
<td>Name of your university</td>
<td></td>
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<tr>
<td>Name of your department</td>
<td></td>
</tr>
<tr>
<td>Email</td>
<td></td>
</tr>
</tbody>
</table>
Evaluation of ICREA Academia

Your motivations to apply for an ICREA Academia award

2. How did you become aware of ICREA?
   - ☐ Call for application published by the ICREA team
   - ☐ Informal discussions with colleagues/peers
   - ☐ Acquaintance with another ICREA Awardee (Academia awardee or Senior researcher)
   - ☐ Other, please specify:

3. What were your motivations for applying to the ICREA Academia programme? Please indicate the importance of the following motivations.

<table>
<thead>
<tr>
<th>Motivation</th>
<th>Very important</th>
<th>Somewhat important</th>
<th>Of little or no importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opportunity to devote myself primarily to research</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Opportunity to expand my research activities (e.g. create or expand your research group, hire additional research staff)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Opportunity to access funding for research</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Opportunity for career progression</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Prestige of the ICREA Academia award</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Salary increase not otherwise available</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Opportunity to develop my research reputation</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Other (please specify):</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

4. Of all of these factors, which was the most important?

Please choose from the drop-down menu.

5. At the time you applied to the ICREA Academia programme, were you seeking to make a career move?
   - ☐ Yes
   - ☐ No

If yes, please specify what were your other options:
# Evaluation of ICREA Academia

## 6. How much do you agree with the following statements about the role of the ICREA Academia award on your career plans?

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I remained in Catalunya, where otherwise I might have sought research opportunities in the rest of Spain</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I remained in Catalunya, where otherwise I might have sought research opportunities abroad</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I remained in the university sector, where otherwise I might have considered opportunities in other types of research institution</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I remained in the university sector, where otherwise I might have considered opportunities in the private sector</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The award had no influence on my career plans</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

Other kind of influence on my career plans (please specify):
Evaluation of ICREA Academia

The benefits of being an ICREA Academia awardee

7. How much have you benefited in the following areas as a result of your ICREA Academia award compared to your situation before the award?

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Strongly agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have been able to reduce my teaching load</td>
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<tr>
<td>I have been able to reduce my administrative load</td>
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<tr>
<td>I have been able to spend more time on research</td>
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<tr>
<td>It has provided direct funding for my research activities</td>
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<tr>
<td>I have received financial support from my university/department for research (in addition to any ICREA funding)</td>
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<tr>
<td>Other (please specify):</td>
<td></td>
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</tbody>
</table>

8. Since you received an ICREA Academia award, how much more of your work time is spent on research? Please choose an estimate from the drop-down menu below.

Before your ICREA Academia award

As an ICREA Academia awardee
Evaluation of ICREA Academia

The impact of the ICREA Academia programme on your career development

9. Please indicate your current responsibilities and roles within the university. Please tick all that apply.

- Senior university role (e.g., Vice-Rector, Dean)
- Head or Deputy Head of Department
- Head of Programme
- Head or Deputy Head of a research centre/institute in the university
- Research Group Leader
- Member of a research group

Other (please specify):

10. Has the ICREA Academia award contributed to your career progression?

- Yes, my academic grade has improved since my ICREA Academia award
- No, my academic grade has not changed
- No, my academic grade has not changed but I am expecting a change in the near future

Please describe any change that occurred in your career and position (e.g., from Associate to Full Professor).

11. Have you acquired new responsibilities since your ICREA Academia award? Please tick all that apply.

- I have been able to establish a new research team
- I have acquired new leadership responsibilities in my research team
- I have acquired new leadership responsibilities in my department
- I have acquired new leadership responsibilities in my university

Please elaborate on any new role or responsibilities you have gained:
### Evaluation of ICREA Academia

12. Have you received any prestigious prize or award since you received an ICREA Academia award? Please tick all that apply.
- [ ] I have received a grant from the European Research Council (ERC)
- [ ] I have received a funding grant from another prestigious institution
- [ ] I have been made a fellow or member of a prestigious institution
- [ ] I received another significant honour or award

Please provide further details of any relevant honours or awards:

---

13. Could you please briefly explain how the ICREA Academia award has allowed you to advance your career and/or contributed to any promotion/prizes/awards you have received?

---

14. In your view, what are the main advantages of being an ICREA Academia awardee within the Catalan research system? Please specify.

---

15. Are there any significant disadvantages to being an ICREA Academia awardee within the Catalan research system? Please specify.
Evaluation of ICREA Academia

Your research achievements

16. What have been your research achievements as an ICREA Academia awardee?

Please indicate your achievements from the options below, with 1 denoting significant achievements and 5 denoting minor achievements. You may select as many options as you want. Please leave blank any that you do not consider as an achievement.

<table>
<thead>
<tr>
<th>Achievement</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>My publication output has increased</td>
<td></td>
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<tr>
<td>My publications in high-impact journals have increased</td>
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<tr>
<td>I have grown and developed my research group</td>
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<tr>
<td>I have established a new research group</td>
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<tr>
<td>I have increased my participation in collaborative research projects within Catalunya</td>
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<tr>
<td>I have increased my participation in collaborative research projects within Spain</td>
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<tr>
<td>I have increased my participation in international collaborative research projects</td>
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</tr>
<tr>
<td>I have been able to attend more research events (e.g. participation in conferences, organisation of conferences or congress)</td>
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<td></td>
</tr>
<tr>
<td>I have received more invitations to give presentations at research events (conferences, etc.)</td>
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<td></td>
</tr>
<tr>
<td>I have increased my involvement in research stays at other universities or research centres</td>
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</tr>
<tr>
<td>I have supported and developed junior researchers (e.g. supervised masters and PhDs and supported post docs)</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>I have won other awards or prizes</td>
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</tr>
<tr>
<td>I have been able to exploit the outputs of my research and to conduct technology/ knowledge transfer activities (e.g. patents)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>I have improved the visibility of my research and my research reputation in Catalunya</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The visibility and reputation of my research has increased in Spain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The visibility and reputation of my research has increased internationally</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Other (please specify):

17. Please provide brief details of the most important achievement.
Evaluation of ICREA Academia

18. Overall, would you say that you are able to meet your objectives as an ICREA Academia awardee? Please think about your initial motivations at the time of your application and tick the correct box.

☐ More than expected
☐ Entirely, as expected
☐ A little less than expected
☐ Significantly less than expected

19. Since your ICREA Academia award, have there been any changes in the size and funding of your research team?

☐ I have been able to attract additional high-quality research staff and PhD students
☐ I have been able to attract research staff and PhD students from abroad
☐ I have been able to secure additional internal university funding for research
☐ I have been able to secure additional funding for research from Catalan public sources
☐ I have been able to secure additional funding for research from Spanish national public sources
☐ I have been able to secure additional funding for research from international public sources (inc. EU)
☐ I have been able to secure additional funding for research from the private sector

Other (please specify):

20. Please provide information on the size of your research team just before you received an ICREA Academia award (in Full-Time Equivalent).

<table>
<thead>
<tr>
<th>Number of PhD students</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of post-doctoral researchers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of senior researchers (associate professors, professors etc.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of your research team that are non-Spanish staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Evaluation of ICREA Academia**

21. Please provide information on the size of your research team as at 1st of October 2012 (in Full-Time Equivalent).

<table>
<thead>
<tr>
<th>Number of PhD researchers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of post-doctoral researchers</td>
</tr>
<tr>
<td>Number of senior researchers (associate professors, professors etc.)</td>
</tr>
<tr>
<td>% of your research team that are non-Spanish staff</td>
</tr>
<tr>
<td>Other</td>
</tr>
</tbody>
</table>

22. Please provide information on the average annual size of your research funding (as Principal Investigator) in the three years before you received an ICREA Academia award. For example, if you started in 2009 as an ICREA Academia awardee, please provide your annual average funding for the 2006-2008 period. *Rounded figures and estimates are acceptable.*

| Average annual value of research funding from Catalan public sources (€) |  
| Average annual value of research funding from Spanish national public sources (€) |  
| Average annual value of research funding from the European Union (€) |  
| Average annual value of research funding from other sources (e.g. industry, other international funding) (€) |  
| Other (€) |  

### Evaluation of ICREA Academia

23. Please provide information on the average annual size of your research funding (as Principal Investigator) for the last full calendar year for which data are available (please also specify the year below). *Rounded figures and estimates are acceptable.*

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average annual value of research funding from Catalan public sources (€)</td>
<td></td>
</tr>
<tr>
<td>Average annual value of research funding from Spanish national public sources (€)</td>
<td></td>
</tr>
<tr>
<td>Average annual value of research funding from the European Union (€)</td>
<td></td>
</tr>
<tr>
<td>Average annual value of research funding from other sources (e.g. industry, other international funding) (€)</td>
<td></td>
</tr>
<tr>
<td>Other (€)</td>
<td></td>
</tr>
<tr>
<td>Year of reference:</td>
<td></td>
</tr>
</tbody>
</table>
## Evaluation of ICREA Academia

### Impact of your research

**24. In your opinion, what impact have you had on your university as an ICREA Academia awardee?**

<table>
<thead>
<tr>
<th>Impact</th>
<th>A large impact</th>
<th>A small impact</th>
<th>Little or no impact</th>
<th>Impact expected in the future</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improvement in the quality of the research conducted in the department</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Attraction of high quality researchers to join the department/university</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Increased collaborations within the department/university</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Increased collaborations with other research groups within Catalunya</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Increased collaborations with other research groups in the rest of Spain</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Increased collaborations with international research groups</td>
<td>☐</td>
<td>☒</td>
<td>☑</td>
<td>☐</td>
</tr>
<tr>
<td>Increased public research funding to the department/university</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Increased private research funding to the department/university</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Development of new research facilities</td>
<td>☐</td>
<td>☒</td>
<td>☑</td>
<td>☐</td>
</tr>
<tr>
<td>Improvement in the research reputation of the department/university</td>
<td>☐</td>
<td>☒</td>
<td>☑</td>
<td>☐</td>
</tr>
<tr>
<td>Improvement in the research strategy of the department/university</td>
<td>☐</td>
<td>☒</td>
<td>☑</td>
<td>☐</td>
</tr>
<tr>
<td>Positive changes in the research behaviours and outputs of other researchers in the department/university</td>
<td>☐</td>
<td>☒</td>
<td>☑</td>
<td>☐</td>
</tr>
</tbody>
</table>

Other (please specify):
### Evaluation of ICREA Academia

#### Effect of ICREA on the Catalan higher education and research system

**25. Please indicate the degree to which you agree with the following statements on the ICREA Academia programme as a whole.**

The ICREA Academia programme has...

<table>
<thead>
<tr>
<th></th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helped retain high quality researchers in the Catalan research system</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Enhanced the reputation of Catalunya for research</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Contributed to improvements in the quality of Catalan research</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Contributed to improvements in the content of Catalan research</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Contributed to improvements in the quantity of Catalan research</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Stimulated change in the research strategies and practices in Catalan universities</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Attracted additional research funds into the Catalan research and higher education system</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Stimulated wider changes in research recruitment and career development practices in Catalunya</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

Other, please specify:

---

**26. What feature of the ICREA Academia programme do you consider to be most significant in contributing to improving the Catalan research and higher education system, and why?**

---

**27. How could the impact of the ICREA Academia programme on the Catalan research and higher education system be improved/increased?**

---

**28. In your opinion, in what ways do ICREA and its programmes influence the changes that have occurred in the Catalan research and higher education system?**
Evaluation of ICREA Academia

29. In your opinion does the ICREA Academia programme continue to meet a real need in the Catalan university system?

☐ Yes
☐ No

Please briefly explain your answer:

30. Please provide any further comments you may have on the role of the ICREA Academia programme and its achievements.
Evaluation of ICREA Academia

ICREA Academia operations

31. Please indicate the degree to which you agree with the following statements on the operational aspects of the ICREA Academia programme.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICREA is sufficiently promoted to its target audience in the Catalan research community.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The information provided by ICREA is clear and effective.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The application process is effective and efficient.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The evaluation of applications is effective and appropriate.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The funding model (€25,000 award to the ICREA Academia awardee, €20,000 financial assistance to the university, €5,000 administration fee to the university) is appropriate.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

32. What one feature of the ICREA Academia programme would you change, and how would you change it?

Please specify.

33. What one feature of the ICREA Academia programme would you retain and why?

Please specify.
Evaluation of ICREA Academia

Thank you for your participation in the survey.

When you click on the “Submit” button below your answers will be securely stored in our system and you will be taken to the homepage of ICREA.
## Appendix C  Examples of Significant Research Achievements

<table>
<thead>
<tr>
<th>Type</th>
<th>Examples</th>
</tr>
</thead>
</table>
| Research grants           | • JSMF grant  
                            • 3 European projects  
                            • ERC starting grant  
                            • Winning an ERC Starting Grant project  
                            • Obtaining an ERC grant |
| Higher quality research   | • Facing more challenging research because I have more time  
                            • It has allowed me to keep the level and improve the quality of scientific production of my lab  
                            • I have increased the number of papers in high impact journals (2 published in 2011) and important books (1 in 2011)  
                            • I have been able to increase the number of publications and the impact factor of them and as a result the reputation of my research has increased  
                            • Increase the quality and quantity of my research. The number of publications in high-impact journals increased.  
                            • Publications in high impact journals  
                            • To increase the impact-factor of my publications  
                            • I have increased my publication output in quantity and quality  
                            • Paper in PNAS, paper in PRL together with team from Princeton  
                            • Two articles, in top field journals and related to my new field of research, Political Economy (Journal of Public Economics, Journal of Economic History)  
                            • Publications in Nature, Scientific Reports, and Physical Review Letters  
                            • The production speed and quality has enormously improved  
                            • I have been able to write in a few years a set of better papers that will be published in better journals  
                            • Developed key contributions to a (potential) new ESA mission  
                            • Have recently published in top journals, and have obtained several new results that are also expected to be accepted at best journals due to their significance  
                            • Having more time and continuity to conduct research has helped me consolidate as an internationally recognized researcher in my area, and my research group is considered the strongest in Europe  
                            • I increased the number of publications and invitations as plenary speaker in conferences  
                            • Number of publications, international visibility, organisation of major conference in Barcelona  
                            • I have been able to develop in depth a new research subject  
                            • Publication of the book "Complexity perspectives on language, communication, and society" by Springer  
                            • My research group is now on the international map  
                            • Three publications in PNAS and 2 in Nature-like journals  
                            • Both the number of scientific publications & impact factor has increased by a factor of two  
                            • I have published in high impact journals, including Nature Chemistry  
                            • Papers in top journals (Nature, Blood etc.)  
                            • Completion of a book (John Benjamins Publishing); completion of research project for the EC  
                            • A paper in 2010 in "Inventiones Mathematicae" in collaboration with French colleague |
| Build/ develop research team | • I have grown and developed my research group. The ICREA Academia Award has been instrumental to obtain additional funds and grants to hire PhD students and postdocs.  
                            • Ability to support junior researchers  
                            • I have been able to build up a bigger and stronger research group  
                            • I have been able also to supervise more closely the junior researchers in my group  
                            • Establishing new research team  
                            • I have grown and developed my research group to become very competitive in the area  
                            • Devoting more time to my PhD students research  
                            • I have grown and developed my research group, especially in the number of postdocs of the group |
<table>
<thead>
<tr>
<th>International collaborations / Research networks</th>
<th>Technology transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td>• More collaborative research and increased publication rate</td>
<td></td>
</tr>
<tr>
<td>• It has provided us with contacts and scientific exchanges with the Metropolitan Museum of Art (New York), The Victoria and Albert Museum (London), The Courtauld Institute of Art (London), Verona, Edinburgh...</td>
<td></td>
</tr>
<tr>
<td>• I have been able to attend a larger number of international conferences (and often been invited to them): and time to organize an international meeting</td>
<td></td>
</tr>
<tr>
<td>• The number of collaborators have increased</td>
<td></td>
</tr>
<tr>
<td>• The number of collaboration with prestigious (both Catalan and international) research groups also increased</td>
<td></td>
</tr>
<tr>
<td>• I received more invitations to give conferences and petitions to become member of scientific committees</td>
<td></td>
</tr>
<tr>
<td>• I did a research stay of 3 months at Stockholm University</td>
<td></td>
</tr>
<tr>
<td>• I have been able to participate in international groups of research</td>
<td></td>
</tr>
<tr>
<td>• I have been able to participate in more EC collaborative projects</td>
<td></td>
</tr>
<tr>
<td>• Becoming a Visiting Professor at overseas university</td>
<td></td>
</tr>
<tr>
<td>• Now I am member of Editorial board of one prestigious Elsevier journal</td>
<td></td>
</tr>
<tr>
<td>• I've been invited to participate in more international collaborative projects</td>
<td></td>
</tr>
<tr>
<td>• I am the coordinator of a Marie Curie Initial Training Network</td>
<td></td>
</tr>
<tr>
<td>• I have been elected President of the Psychometric Society</td>
<td></td>
</tr>
<tr>
<td>• I have been able to increase my cooperation with colleagues in international centers</td>
<td></td>
</tr>
<tr>
<td>• To be made a Fellow of the IEEE</td>
<td></td>
</tr>
<tr>
<td>• I have increased my participation in international collaborative research projects</td>
<td></td>
</tr>
<tr>
<td>• I have created an international network with around 70 members from 3 continents</td>
<td></td>
</tr>
<tr>
<td>• Marie Curie Network coordinated by our group</td>
<td></td>
</tr>
<tr>
<td>• I have created a Start Up at the University and registered two patents</td>
<td></td>
</tr>
<tr>
<td>• I have been able to conduct more technology transfer activities (patent filling and follow up activities)</td>
<td></td>
</tr>
<tr>
<td>• Important increase to technology and knowledge transfer activities</td>
<td></td>
</tr>
<tr>
<td>• Clinical trials</td>
<td></td>
</tr>
</tbody>
</table>
Appendix D Statistical Notes

<table>
<thead>
<tr>
<th>Steps</th>
<th>Notes</th>
</tr>
</thead>
</table>
| Random Sampling      | • To test whether ICREA’s peer review process has been successful in selecting outstanding professors we compare the successful Academia Professors to the unsuccessful applicants. From the latter group we randomly sampled 107 professors following the same distribution of the successful professors in terms of scientific areas and ICREA calls to guarantee comparability. By sampling 107 observations we are accepting an error margin of 8.7%.  
  • To test how professors supported by ICREA Academia compare to ICREA Seniors we compare the selected Academia Professors to the selected ICREA Seniors. From the latter group we randomly sampled 80 professors to match the same error margin of 8.7% tolerated in the sampling of unselected Academia Professors. We matched the distribution of the Academia and Senior Professors in terms of scientific areas and age to guarantee comparability.  
  • In both cases we hence accept an 8.7% error margin in the calculations of our indicators (mean, median, percentages below and above the median in the hypothesis testing). |
| Statistical Test     | • To perform the hypothesis testing the median test is used. The median is a nonparametric equality-of-medians test (similar to the Mann-Whitney test) that can be used when one does not assume that the dependent variable is normally distributed. It performs a nonparametric K-sample test on the equality of medians. It tests the null hypothesis that the K samples were drawn from populations with the same median. For two samples, the chi-squared test statistic is computed both with and without a continuity correction. We use the exact option to display the significance using Fisher’s exact test that provides us with both one- and two-sided probabilities. |