

**FAS Centres of Excellence
Mid-Term Evaluation**

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**By John Solomos (Chair), Elina Hemminki, Steffen Hillmert, Ronald
A. Knibbe, Johannes Siegrist, Ursula M. Staudinger**

Introduction

For this Mid-Term Review we were asked to provide a review of the work of each FAS Centre of Excellence over the first five year period of their work, focusing on the scientific quality of the research. After a preliminary meeting of the review panel we requested a self-evaluation report from each of the FAS Centres. Each of the self-evaluation reports included.

A part produced by the Rector of the University that responded to key questions set out by FAS and the review panel

A part produced by the senior researchers of each Centre that provided detailed information about the scientific programme of research, the key research achievements in the first period of funding, plans for the future, international collaboration, the work of the research schools and related key information. In the end we were provided with the following information:

- A self assessment by each Centre about their research, publications and general programme of work
- A statement by each Rector about the relevant Centres and their integration into the research profile of the relevant institution
- An external assessment of 10 key publications provided by each Centre by relevant experts in the field of research of specific Centres
- Background information about the work of each Centre, including copies of the original applications, the first assessment of the Centres and related materials.

In addition the Review Panel held hearings in the FAS Offices from 29th to 31st August 2011. This provided us with the opportunity to explore key questions with the Rector of each University and key researchers from each of the Centres. We were also able to discuss the assessments provided by the external assessors of the scientific quality of the key nominated publications and to reflect on our assessments of the information we received from each of the Centres.

In producing our evaluation of the 10 Centres we have drawn on both the documentary information and the information we gathered as a result of the hearings in Stockholm. We have organised the report in such a way that we review the work of each of the Centres up to this point of their research. We have structured the reviews of each Centre around key headings and hope that this will allow the Board of FAS a clear overview of how we evaluate the achievements of each Centre, including their strengths, limitations and their plans for the future. At the beginning of each evaluation we have also provided some basic background information about the organisation of each Centre and the level of funding that they receive from FAS. We have taken into account the findings from the first evaluation of the 10 Centres.

Karolinska Institute

ARC Ageing Research Centre

1. Organisation and Leadership

ARC was established in the year 2000, due to a grant from FAS. In 2007, ARC was granted 10 million SEK per year for ten years as a FAS Centre of Excellence. ARC is a multidisciplinary centre in which both Karolinska Institute (KI) and Stockholm University are collaborating.

ARC is a centre within Karolinska Institute and administered by the Department of Neurobiology, Care Sciences and Society. It is led by a Governing Board that includes representatives from FAS, Karolinska Institute, Stockholm University and the Stockholm Gerontology Research Centre, as well as other Swedish universities. The role of the board is to ensure professional administration of the Centre and compliance with the contract by the three major actors (FAS, Karolinska Institute and Stockholm University). There is also a Steering Committee led by the ARC director. It is responsible for scientific, organizational and economical issues. Daily decisions, actions regarding promotion, financing, economy, staff, and work environment are ensured by the Executive Group, consisting of the scientific director, the head and deputy head of the division.

ARC is organized into three sectors: Medicine, Psychology and Social Gerontology. Each sector includes researchers, guest researchers, post docs, and PhD students. In connection to the Centre there is also a research school: National Graduate School for Ageing Research. This school involves collaboration with another FAS Centre of Excellence, the Centre for Ageing and Supportive Environment (CASE) at Lund University. The ARC research school focuses on biological-psychological and socio-demographic aspects of ageing.

It is led by a steering group including all ARC's senior researchers and a Director of Studies. The operative responsibility for course development, planning of teaching and related activities, as well as quality development and control is delegated to the Director of Studies. The administration is carried out as part of the university's ordinary management of graduate studies.

2. Funding

The grant from FAS of 10 million SEK per year constitutes about 25 % of the total budget of ARC. Co-funding from Karolinska Institute and Stockholm University makes up 15 %, while external grants to individual researchers, together with donations, makes up 60 %.

According to the self-evaluation report the FAS grant has been used for senior positions and running costs. Senior researchers have secured funds for remaining salaries and costs, which have tripled the FAS grant. For the next 5-6 years the economic situation is stable as ARC is guaranteed an annual budget of 20 million SEK which is expected to be doubled by external grants.

In addition to this ARC also receives a FAS grant of 1 million SEK for their research school, a grant that ends 2012.

3. Development of the Centre

3.1 Original Plans and Actual Development

The self-evaluation report provided by ARC documents the impressive progress made by the Centre in the last five years. The Centre activities stayed true to its mission which is high-quality ageing research from a medical (biomedicine, epidemiology), psychological (psychology) and social (sociology) perspective. Four questions (why do we age?, why do we age so differently?, is it possible to decrease morbidity and disability?, is it possible to provide better care?) are guiding the research in the three research areas: (i) public health, (ii) health differentials, (iii) brain ageing. All thirteen projects originally proposed have been started as well as four additional ones. Five large population-based data sets have either been maintained or extended through additional data collection.

3.2 Added Value and Visibility of the FAS Centre

ARC has a high return on investment. Across the five years the FAS money is matched with 50% funds from Karolinska institute and Stockholm University as well as 200% third-party money. ARC has a physical existence as a Centre which contributes to its success. It has invested the FAS money in the senior researchers of the Centre. This allows for high identification with the merits of the FAS funding and ensures full dedication to the purpose of the Centre. The governance structure functions very well to ensure high quality output as well as cross-disciplinary co-operations. The website is in very good shape. The annual research reports are exemplary. The Karolinska Institute leadership has high commitment and places great emphasis on the Centre. Ageing is one of the research foci of KI. KI provided for quite costly imaging infrastructure to ensure top-level working conditions of ARC researchers.

4. Evidence of Research Excellence

4.1 Publications

246 high-level publications and dissertations have been produced. They include highly prestigious journals such as Science, PNAS and BMJ. The number of publications increased by 70% since the FAS funding was attracted in 2007. The ARC publications are in the top quartile of KI with regard to citations. The ARC director received a KI Distinguished Professor Award which entails 3.5 million SEK across 5 years and another senior ARC professor has been appointed Af Jochnick professor by KI which entails 50 million SEK across 10 years. In a recently completed external evaluation of the whole KI, ARC received the highest possible rating (outstanding) in both areas that apply to ARC, that is, Epidemiology and Neuroscience. The external reviewer concludes that 'the Centre has contributed significantly and highly visible to ageing research internationally.' ARC manages to make best use of the excellent availability of panel data sets in Sweden.

4.2 Degree of Innovation

The external reviewer, points out that the work is of high originality. For instance, it was a publication by ARC that first demonstrated the association between social activities and reduced risk of Alzheimer's. This publication has triggered a host of studies from other groups that replicated the finding. Highly innovative is also the

finding published in Science that demonstrated that transfer after cognitive training is mediated by the Striatum.

4.3 Cross-fertilisation among Research Groups

The set-up of ARC provides the possibility to combine neurophysiological and behavioural approaches to second classical epidemiological work and gain insight in the mediating mechanisms of correlational findings. Many good steps have been taken to make these opportunities come to life. There is more potential to be tapped in the years to come. The systematic integration of the behavioural (psychology) and contextual (sociology) level may be implemented more fully when it comes to understanding the causes of ageing and of morbidity. But these linkages take time to develop. We are confident that they are well under way and will unfold more fully in the next funding period.

5. Additional Funding

Besides the awards mentioned above ARC has been extremely successful in attracting third-party funding. The total volume across the last five years (84 million SEK) is double the amount of the FAS funding across during the same time period.

6. International Networks and Collaboration

6.1 Research

Strong collaborations with Germany (Max Planck Institute for Human Development), with University of Turku (Finland), UCLA (Ageing Centre) exist. Also, ARC members participate in three EU projects such as EUCODE and Nu-AGE. All of these international co-operations build on the strengths of ARC and develop them further in a synergistic manner.

6.2 Recruitment

The success of ARC in attracting international doctoral students and Postdocs as well as junior researchers is remarkable. They come, for instance, from Germany, the United States, China, Italy and Finland. ARC is making a major contribution internationally to training the next generation of highly qualified ageing researchers.

7. Links to Practice and Policy

From the beginning ARC have had a strong link with Äldercentrum as well as Svenskt Demens Centrum. In this way, the latest research findings immediately are applied in practice of advice giving and care taking. Senior researchers of ARC serve in several national agencies to support the public based on the insights gained from research conducted at the ARC.

8. Research School

All doctoral students at ARC working on projects are also members of the ARC Research School. They participate in courses as well as in international forums, which cut across the disciplines represented at ARC. Thus, they obtain a broad multidisciplinary education during their PhD studies at ARC. The average time to PhD is 4 to 5 years, which is above average in Sweden.

9. Future Plans and Prospects

The current generation of leading scholars has shaped the work of the Centre and mentored the next generation of scholars in the field, who will be able to take over once the current generation of leading scholars steps down. This is a foresightedness that is to be applauded.

10. Summary Evaluation and Recommendations

In sum, ARC has developed very well. It represents an extremely high return on investment of FAS money. The future of ARC seems well prepared in many respects. KI places high priority on ARC. Against this very positive background, some suggestions for further improvements are made:

- The selection of the three research areas seems rather arbitrary. It may be useful to consider establishing research areas based on the central guiding questions of ARC, which may also further strengthen the cross-disciplinary links.
- It seems necessary to have a senior researcher in the area of ageing of personality and self-regulation in order to more fully capture the interactions between biology, context and person.
- In the next five years, it would be good to see the research on the positive plasticity of ageing strengthened besides the current focus on gaining a better understanding of age-related diseases.
- Also, the social sciences should be strengthened to provide a better balance vis-a-vis the colleagues from the medical science as well as psychology.
- The number of Doctoral Students should be increased again to the levels of 2007/2008. The researcher power represented at ARC should be used more intensely to train young researchers.

We recommend the Board of FAS to consider support at a higher level.