Evaluation of the Programme Multidisciplinary BIO

The strategic Japanese-Swedish cooperation programme 2005-2014

Barbara Canlon, Hans Söderlund & Ove Öhman

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Preface

The programme Multidisciplinary BIO was launched 2005 by SSF (Swedish Foundation for Strategic Research) and VINNOVA (Swedish Governmental Agency for Innovation Systems) jointly with the Japan Science and Technology Agency (JST). The programme was based on the agreement concluded in January 1999 between the Japanese and Swedish governments on cooperation in science and technology. The total programme turnover was 92 million SEK 2005-2014 financing 27 Swedish-Japan co-projects. This programme evaluation covers mainly the Swedish projects impact on the Swedish society.

The evaluation has been carried out by an external evaluation committee led by Professor Barbara Canlon, Karolinska Institute, Stockholm, Sweden together with Professor Hans Söderlund, VTT, Esbo, Finland and Dr. Ove Öhman, Meje AB and Fiomi Diagnostics AB, Uppsala, Sweden.

Responsible for the evaluation within SSF and VINNOVA has been Mattias Lundberg, SSF (project leader), and Mats Jarekrans, VINNOVA. VINNOVA and SSF wish to express our sincere thanks to all the persons in projects involved, providing time and efforts to prepare and participate in interviews with facts and experiences. Without a high quality in these efforts by so many, this evaluation would not have been possible. We also express our thanks to Mr Lennart Stenberg, VINNOVA, Senior Advisor, International Cooperation & Analysis, ,contributing with background to the programme and valid insights for this evaluation.

Finally we thank the evaluation committee for all their work to carry out the evaluation and produce this report, based on their comprehensive experiences.

Stockholm in November 2015

Charlotte Brogren
Director General
VINNOVA

Lars Hultman
CEO
SSF

Preface from the authors

This document constitutes the evaluation of the joint programme Multidisciplinary BIO (MDB) that started in 2005 and ended in 2014. The programme was jointly funded by the Japan Science and Technology Agency (JST), the Swedish Foundation for Strategic Research (SSF) and the Swedish Governmental Agency for Innovation Systems (VINNOVA). This evaluation was requested by SSF and VINNOVA and has concentrated on the Swedish scientific environments funded by the programme.

The aim of this evaluation is to get insight on the value of this particular international cooperation both from a scientific and from a societal and industrial point of view and to determine if the programme fulfilled its aims. A concrete result of this evaluation will be a set of recommendations that will be useful for developing future international research partnerships. The evaluation report is based on background information from the human resources in the projects, members in the programme committees, staff at the funding organizations, written policy documents for the programme, bibliometrics, scientific publications, final reports from the project leaders, responses from a questionnaire and a selected number of telephone interviews.

SSF and VINNOVA have decided that the programme evaluation should be executed by a programme evaluation committee of three persons. One person should be the chair of the committee and two persons should be expert in the research fields. The committee had the freedom to select the methods and design for the evaluation and was recommended by SSF and VINNOVA to consider methods such as *i)* bibliometric analysis; *ii)* interview methods; *iii)* questionnaires and *iv)* analyses of the final reports of the project leaders. The evaluation procedure began in February 2015 and was complete in September 2015.

During October 2014 SSF and VINNOVA assembled an evaluation panel to review the programme. The members of the panel were:

Professor Barbara Canlon, Karolinska Institute, Stockholm, Sweden (Chair)
Professor Hans Söderlund, VTT, Esbo, Finland
Dr. Ove Öhman, Meje, AB and Fiomi Diagnostics, AB, Uppsala, Sweden

The evaluation of the programme concludes that there was an overall positive outcome for the majority of the collaborations when considering scientific synergy and cooperative achievements. The programme succeeded in giving leading researchers in Sweden and Japan a venue to initiate and to reinforce strong and lasting links between the two countries. The majority of projects continued to actively collaborate after the funding period ended.

Barbara Canlon *Hans Söderlund* *Ove Öhman*
Chair of the Evaluation Panel

Executive summary

The Multidisciplinary BIO (MDB) programme was a joint funding agreement between the Swedish Foundation for Strategic Research (SSF) and the Swedish Governmental Agency for Innovation Systems (VINNOVA) and the Japan Science and Technology Agency (JST) between 2005 and 2014. The specific objective of the MDB programme was to initiate and reinforce strong and lasting collaborations between Sweden and Japan in order to achieve world-class results leading towards new innovative technologies. The multidisciplinary research area included life sciences, engineering, physical, computer and mathematical sciences and any combinations of these bio-related disciplines.

In January 2015 SSF and VINNOVA appointed an expert panel to evaluate the MDB programme. The focus of the evaluation was on the scientific, entrepreneurial and cooperative achievements as well as for the potential for continuity after the programme ended and to make recommendations for future international programmes. The necessary background documentation including the planning, launching and the final reports from all the projects were made available to the evaluation panel.

The panel concluded that the MDB programme was successful for many, but not all of the groups. The more successful projects were those that had on-going collaborations with the Japanese partner before the start of the MDB programme. The MDB programme clearly was an added value for these groups enabling them to continue a fruitful collaboration resulting in several high ranking publications and more interaction in the form of bi-lateral visits and conferences. The panel recognized that the two year funding was too short for developing solid research collaborations and publications. It was noted by a follow-up question in 2015, that many of the groups continued collaborating after the end of the funding period. As a result, the panel concludes that the incubation time for allowing these collaborations to mature requires more than two or three years.

The more important recommendations of the panel are i) to extend the programme duration beyond 3 years; ii) to develop a financial plan that would enhance the bilateral exchange (mobility) of personnel so that the true synergistic benefits for the international collaboration are the main focus and iii) Information sessions designed to support the grantees for better understanding and handling cultural differences (both scientifically and societal).

1 Multidisciplinary BIO The strategic Japanese-Swedish cooperation programme

1.1 Background of the MDB programme

Based on the agreement concluded in January 1999 between the Japanese and Swedish governments on cooperation in science and technology, the funding organizations Japan Science and Technology Agency (JST), Swedish Foundation for Strategic Research (SSF) and Swedish Governmental Agency for Innovation System (VINNOVA) established in 2005 a scheme for joint funding of Japanese-Swedish cooperative research projects. There have been five calls for the Multidisciplinary Bio programme and 218 applications were submitted during the programme period. In total, 27 projects were funded during the programme period.

1.2 Objectives of the MDB programme

The aim of the Multidisciplinary BIO programme was to strengthen the collaboration between Sweden and Japan and to achieve world-class scientific results that would give new innovative technologies. The multidisciplinary research field is defined as one that combines life sciences with other scientific fields such as engineering, computer science, mathematics, physics and chemistry. Specific examples of such research areas are bio-nanotechnology, bio-imaging, bio-MEMS, bioinformatics, computational biology, systems biology, tissue engineering, combinations of robotics and neuroscience, and biomimetics. Other examples are combinations of two fundamentally different approaches within life science, such as functional genomics or molecular medicine.

At the onset of the programme this area was undergoing strong development and was considered important in both countries for achieving growth and sustainability. The programme aimed to give leading researchers in Sweden and Japan a venue to initiate and to reinforce strong and lasting links between the two countries by the means of focused research projects. Strengthening contacts and enlarging networks between Sweden and Japan were expected to give added value to other, non-participating actors in academy and industry.

1.3 Basic information on the programme and funding

During the establishment JST, SSF and VINNOVA, selected the Multidisciplinary BIO as the field of research for which the joint funding scheme was applied during 2005-2014. The total programme turnover was 92 million SEK 2005-2014, of which 23, 23 and 46 million SEK from SSF, VINNOVA and JST, respectively. The projects from the first three years of the programme were funded for a period of two years while the last two years received funding for

three years. First year applicants could apply for a new two-year period in connection with the third call, but only in competition with proposals for new projects.

1.4 Criteria used for selecting the projects

There were 4 criteria used to evaluate the applications. Conformity with Programme Aims and Designated Research Fields. The proposed activity shall conform to the aims of the programme and the research fields that the programme designates. In addition, the proposed activity shall be supported by the institutional resources available. Capability of Research Leaders (one on each side). The research leaders shall have the insight or experience necessary for pursuing the activity and the ability to manage the cooperation and reach the project goals during this programme's period of support. Appropriateness of Plan. The plan shall incorporate an appropriate system for implementing the activity and be realistic in relation to the project budget. Effect of the Activity. The proposed activity can be expected to achieve any of the following, through the cooperation with researchers in the counterpart country:

A Opening up of a new field or new advances in science and technology through the creation of new scientific knowledge in an existing research field
B Nurturing of researchers able to play a central role in future research exchanges with the counterpart country; Sustained development of research exchanges with the counterpart country initiated by this activity
C On-going research activity with a Japanese partner was important.

Finally, the announcement for applications stated that an important criterion should build on and reinforce already on-going research activities in each research group and contribute significant added value to the projects. It was also stated that researchers from industry may participate in the joint collaboration but, on the Swedish side, not as main applicants.

1.5 Methods used for selecting the projects

There was a two phase parallel process that was used to evaluate the applications. First, the Swedish committee evaluated the grants and then their rankings were sent to the Japanese partners. In turn the Japanese committee ranked the applications and returned their scores to the Swedish committee. Agreement between the two committees regarding the top ranking applications was high and some ranking adjustments were made for the remaining applications.

Several criteria were used for ranking the applications. A pre-requisite was that the top applications had a high scientific quality, a strong bio-aspect, a high multidisciplinary profile and had a Japanese partner who was strongly complementary to the project. A list of the projects that received funding is found in Appendix 1. Those projects that did not fulfill these criteria were lower ranked than those who could demonstrate a strong multidisciplinary project with a strong bio-aspect and having a strong complementary Japanese partner.

All reviewers of the Swedish applications followed the disqualification rules (jävsregler) for VINNOVA and SSF and did not take part in the discussion of the application in question or the evaluation of the application when there was a conflict of interest.

2 Specific aims of the evaluation

The aim of this evaluation is to get insight on the value of this particular international cooperation both from a scientific and from a societal and industrial point of view. The main focus is on the Swedish research environments and their interactions with their Japanese partners and to determine the degree of success the programme achieved.

The aims relevant for this evaluation can be divided into four major dimensions or perspectives:

- Scientific achievements and successes were evaluated by quantifying the number of joint publications that were published. Other points that were evaluated for scientific achievements included the exchange or use of technological equipment, learning new techniques (or access to databases, etc.).
- Entrepreneurial achievements and successes were evaluated by determining the number of joint patents or patent applications that were obtained from the programme. Other points that were used for determining the entrepreneurial achievements were new relationships with Japanese companies or if a Swedish partner started a career (academic or industrial) in Japan or vice versa. While this was not a criterion for being awarded a grant it was of specific interest for the evaluation.
- Cooperative achievements were determined in relation to the physical or virtual interactions that occurred during the funding period. These interactions included bilateral visits, meetings arranged within the partnership (could even include meeting at international conferences), or the exchange of materials (i.e. chemicals, antibodies, products etc.) and software.
- Continuity after the programme period ended was evaluated by determining the number of joint publications that were published after the end of the funding period and documented evidence that interactions within the partnership were still active. These additional activities could include bi-lateral visits, exchange of materials, student or post-doc exchange, additional funding through collaborative grants or continued database building.

An additional aim of the evaluation was also to look upon the administrative, communication and organizational set-up of the programme between two Swedish organizations, one Japanese organization and the funded projects.

3 Evaluation procedure

The evaluation panel had an introductory meeting on January 28, 2015 at SSF´s main office in Stockholm. The members of the evaluation committee and key administrators from SSF and VINNOVA were present. Mattias Lundberg, the project leader from SSF, presented the Multidisciplinary Bio programme and outlined the procedures and timeline for the evaluation. The evaluation panel was given all the necessary documents (Appendix 2) including the Guidelines for the Evaluation (Appendix 3). The evaluation panel had several telephone conferences and email exchanges to discuss the Guidelines and the aims relevant for the evaluation. Once in agreement, the panel then read and summarized the final reports from each project leader (Appendix 4). The panel then requested a questionnaire be sent to the project leaders to determine if the collaboration continued after the finding period ended (Appendix 5). Interviews via Skype were conducted with four project leaders (Appendix 6). A mid-evaluation meeting took place on the 21st of May with SSF, VINNOVA and the evaluation panel. The final draft of the evaluation was prepared by the panel between March and August.

4 Results of the programme

4.1 Scientific synergy

The overall scientific synergy, in the form of joint publications, has had a moderate outcome. Of the 27 funded projects there was a total of 36 joint publications (17 groups had joint publications and 10 groups had none). There were 7 groups with one joint publication; 4 groups with 2 joint publications; 4 groups with 3 joint publications; 1 group with 4 and 1 group with 5 joint publications (Appendix 5).

It must be noted that the number of joint publications for the 17 groups was relatively low in comparison to the total number of publications from the individual Swedish groups over the same period of time as evaluated through PubMed. This finding suggests that the MDB projects comprised only a minor portion of the overall effort of the laboratories. Likewise, the groups without any joint publications reported publications that were relevant to the MDB project but without Japanese co-authors and therefore it remains questionable to what extent the MDB funding was used to generate the publications. A number of projects reported exchange of materials or techniques, but did not report joint publications.

With the intention of quantifying the degree of collaboration with research productivity a bibliometric analysis was attempted. However, the data was difficult to assess because several of the publications collected from the projects did not include the MDB, SSF or VINNOVA in the acknowledgements and one could not conclude that those particular publications were truly part of the MDB programme. Other publications, from groups with pre-existing collaborations, were from the same year the collaboration started and these publications were obviously from a pre-MDB collaboration. Thus, there were too many uncertainties and therefore this analysis was not included in the evaluation.

4.2 Entrepreneurial achievements

Due to the role of SSF and VINNOVA in the Swedish research environment and innovations, the evaluation panel was asked to judge the societal and entrepreneurial achievements of the projects. It must be noted that this was not a part of the programme description nor an evaluation criterion when selecting the projects to be funded. Consequently 18 of the 27 projects were clearly directed towards fundamental research and any direct impact on economy or healthcare was out of their scope. For the remaining 9 projects the overall entrepreneurial achievement was also limited. There was one joint patent with priority in Japan. Five Swedish patents were applied for but without any Japanese scientists (Appendix 5). It is far too much to expect that joint patents would be obtained in the short duration of funding but it is nevertheless curious that none of the 5 Swedish patents had any Japanese applicants despite the fact that the patent was related to the collaborative project. Three projects described activities which directly can be seen as working for links to entrepreneurial activities. Two of have created IPs with

beneficiaries in Swedish companies but with Japanese technology input, while another has industrial contacts to the USA relating to the project, but without Japanese input.

4.3 Cooperative achievements

Most of the projects describe the cooperation as intense and central to the advancement of the project, while a few reports (5 in total) do not give any comments on cooperation achievements (Appendix 5). Since the nature of the programme has been to increase cooperation between two countries this should have been a main focus when reporting on the overall results of each project. However, it could also be that the pure cooperative results takes time to blossom, and the cooperative achievements would be more readily apparent at the end of the funding period. (see Continuity, next chapter). The majority of groups report that they had a number of bi-lateral visits. The duration of these visits extended from a few days to a few weeks and seldom beyond that duration. Another activity that was reported included conferences that comprised Swedish and Japanese partners and at times other participants from other countries. Two groups reported the employment of members from their group in Japan. One was a Swedish post-doc and the other was the project leader being employed by RIKEN.

4.4 Continuity

A question concerning the continuation of the Swedish/Japanese collaboration was sent out during April 2015 to the 27 applicants. A total of 24 responses were returned (Appendix 5). The responses indicate that many of the projects continued to have collaborations with their Japanese partners even after the funding ended. The 24 responses indicated that there were an additional 20 joint publications and several manuscripts were being prepared. Joint funding was reported from two groups (FP 7 and smaller grants). Exchange of materials and work on a database continued from two different groups. Bilateral visits continued from 5 different groups and a Swede is now employed at a Japanese university. A Swedish post-doc is working in Japan and two Japanese post-docs are working in Sweden. These are very positive outcomes and indicate that the incubation time for developing this particular international exchange is relatively long.

4.5 Administrative, communication and organizational set-up of the programme

The final report form requested by VINNOVA and by SSF had two different formats making it difficult to compare the different projects supported by each agency. The VINNOVA form was rather short and difficult to get any in-depth information about the final results of the programme. The report form by SSF enabled the investigators to elaborate on their activities and performance and therefore made the evaluation much easier and more informative.

A better final financial report for how the funding was used would have been an important indicator to judge how much was spent on bilateral visits, guest researchers, post-docs or joint symposiums and other indicators that would indicate a strengthening of the scientific collaboration. The VINNOVA final report form does not request any specification of how the

funding was used but rather wanted to know if there was funding remaining. The final financial report requested by SSF combines materials together with travel in their report and thus it is difficult to evaluate how much travel money was used.

International programmes like the MDB gives added value not only through direct scientific achievements but also from a "science-culture" perspective. This aspect builds on actual long- or short term stays in the international environment. This is particularly important for younger scientists, graduate students and post-docs. Their learnings give fruit later on, and are not observable from the reports on the results within the programme framework. There are also a few examples were the programme actually has led to the recruitment of Japanese scientists to Swedish positions. This is one of the positive outcomes of the programme.

5 How successful was the MDB programme

5.1 Did the MDB programme strengthen the collaboration between Sweden and Japan?

The MBD programme made it possible for selected groups to build on and/or reinforce already on-going research activities with Japan. In particular, there were three main types of activities that were common. One allowed the Swedish group to learn and import novel techniques from Japan. The second made it possible for young Swedish scientists (graduate students and young post-docs) to spend time in Japan, to learn techniques and to learn the mode of performing science in another culture. The third activity was visits from the Japanese collaborators to Sweden. Many, but not all projects performed one or two of these aims and only a few accomplished all three activities.

By far the most successful projects were those that had on-going collaborations with the Japanese partner before the start of the MDB programme. There were a total of 13 groups in this category. The MDB programme clearly was an added value for these groups enabling them to continue a fruitful collaboration resulting in several high ranking publications and more interaction in the form of bi-lateral visits and conferences. Interestingly, these groups are those that are continuing their collaborative work with their Japanese partners with the exception of one Swedish project that has not continued their collaboration.

There were 14 Swedish groups who did not have a pre-existing collaboration with Japan. Of these 14 groups there were three groups that developed a successful interaction with their Japanese fellows. These three groups published between 3 to 7 articles, obtained joint funding and continued developing a database.

The remaining 11 Swedish groups that did not have pre-existing collaborations with Japanese partners produced the least number of publications and had the fewest number and types of interactions with the Japanese groups. These more superficial activities included skype calls and joint discussions at international conferences (not held in Japan or Sweden). For these groups it appeared that the Swedish and Japanese groups were working in parallel with a low level of interaction. This group also had the fewest number of bi-lateral interactions and many have either not continued with the collaboration or have not responded to the questionnaire that was sent to them in April 2015. Thus, 16 of 27 projects (60%) had a successful scientific interaction with their Japanese partners and continue to interact scientifically.

In addition to the geographical distances between the two countries there are also large cultural differences that may or may not have made the collaborations challenging. Several project leaders expressed such concerns, but with time, could appreciate and handle these differences.

Nevertheless, such cultural differences both at a scientific and societal level may have slowed down the initial phase of the projects for some groups (Appendix 6).

For us, as evaluators, it seems as the primary selection of projects was based on excellence and novelty in research by individual groups rather than on synergistically matching inter-disciplinary competences between the Swedish and Japanese groups. The groups that were selected into this programme are representing very well qualified Swedish scientists in the MDB sector. The angle of looking on group competence rather than synergy is observable from the selection process. The Swedish panel selected the best Swedish groups and the Japanese panel the best from Japan. Only at the final stage were the two lists compiled. We observe the same in our evaluation and unfortunately we have no access to the reports from the Japanese groups (possibly due to those reports being written in Japanese). It can be noted that searching JST´s homepage any information regarding the MDB programme was not found, at least when searching on the English site.

5.2 Did the programme achieve world-class scientific results that lead towards new innovative technologies?

The selected Swedish groups are all operating on a high international standard. A selected number of groups have jointly published articles in the highest ranking journals clearly suggesting that they have achieved world-class scientific results. The majority of publications that have been produced from this programme tend to include novel findings that used high technology in order to generate the innovative findings. Most of the projects have used the state-of-the art technology that is in use in both Swedish and Japanese laboratories. However, in several cases it is unclear to what extent the MBD programme was instrumental in adding value towards new innovative technologies. The more successful groups, who already had established contacts with their Japanese partner, had achieved world-class results but with a significantly greater economic support from other agencies. It is therefore difficult to evaluate the degree to which the MDB programme facilitated this scientific advancement since there was co-funding. It is also difficult to speculate if the scientific advancements would have been achieved without the support from the MDB programme. In the cases in which the contacts were limited to brief contacts at meetings and scarce teleconferences the programme increased its value when a junior scientist obtained experience in the participating Japanese laboratory. This was not the intention of the programme but, fortunately such low levels of interactions was an exception rather than the rule.

5.3 Did the programme initiate and reinforce strong and lasting links between the two countries?

The programme initiated collaborations for some of the groups and reinforced collaboration in other groups. At the end of the funding period it appeared from the final reports that many of the projects had faded out when funding ceased. However, the question that was sent out to the research groups in April 2015 clearly demonstrated that the 24 who responded (3 did not respond) there were 22 groups that continued to collaborate and only two that did not (Appendix 5). The continuation of the collaborations was demonstrated in the form of joint publications

and bilateral visits. In fact, as of April 2015 there were an additional 20 joint publications published and 3 joint manuscripts. Only in a few cases has the collaboration led to a significant increased contact between Sweden and Japan and many potential bridgeheads have been created for further collaborations. From the reports it seems that “spill over” effects were limited. These findings are indicating that it takes a relatively long time for basic research to reach third parties and that the time span for the MDB programme was too short for this type of added value. Nearly all of the reports and all the individual interview via Skype expressed gratitude to the MDB programme for facilitating the Japanese collaboration that resulted in the exchange of ideas and knowledge as well as increasing mobility of researchers and students.

6 Recommendations for future international collaborations

International contacts and collaborations are essential in science and national boarders should not limit scientific interactions or advancements. For young scientists, there is a great advantage for them to work in an international laboratory such that they can development their skills, career possibilities and gain an appreciation for interacting with different cultures and mindsets. Therefore, it would have been optimal to have seen a more frequent occurrence of the bilateral exchange of doctoral students and post-docs. For future collaborations emphasis should be placed on bilateral laboratory visits for students and post-docs and perhaps by partially directing funding for this activity.

Perhaps a more stringent way of securing a better collaborative synergy would have been to have a considered that the Swedish side uses the funding for employing a Japanese scientist (senior, post-doc or student) and vice versa. In many cases the Swedish funding was used to support a Swedish post-doc who may or may not have spent time in Japan.

The biosciences rely on novel techniques and instrumentation. Many labs are specialized in a single or at most a few advanced analytical methods. To solve underlying biological mechanisms, technical advancement and competence is essential and obtaining a broad repertoire of techniques is a necessity. To have the opportunity to obtain new techniques, wherever they are found, is the receipt for success. Hence, targeted support for technique import would be of utmost importance.

The monetary value of the MDB grants was relatively small. To be useful they should be used to build bridges, not to support consumables and the daily running of experiments. A strong recommendation to SSF and VINNOVA is to design the calls, and the evaluations of the applications, so that the true synergistic benefits for the international collaboration are the main focus. The grants could have had a broader and more flexible perspective in their criteria for funding. In some cases 200.000 SEK could have been enough to bring home techniques and for the bilateral exchange of students and scientists. In other cases multimillion grants may be needed for more technically advanced projects with longer visits in the form of employment at one of the partner´s universities.

It was apparent that the two year funding was too short for developing solid research collaborations as described in the final report from the investigators. However, when an additional question was sent out in April 2015 many of the groups reported continued collaborations (publications, bilateral visits etc.) after the end of the funding period. Thus, the incubation time for allowing these collaborations to mature requires more than two or three years. It would also be important to be clearer on the purpose of increasing long-term networking and collaborations and therefore make the programme longer in time but with less

money for the research itself, but rather for enabling personnel exchange. It could also be an advantage to give extra benefits for joint publications and patents that are generated from the project.

If entrepreneurial achievement was seriously desired as an outcome, then perhaps awards should have gone to those innovative projects that could obtain joint co-funding with business and not-for-profits sponsors. A vision of the entrepreneurial or societal impact of the research could have been requested in the research plan. It was curious that there was a total of 5 patents applied for during the funding period but that only one of these was jointly applied from Sweden and Japan (with priority to Japan). The reasons for this are not understood but could depend on complex international ownership regulations.

The projects are from a scientific standpoint different and with different technical needs but they have probably many similar hurdles when it comes to collaborations over long distances as well as cultural and social differences. We believe that a fraction of the monetary funds should be used for cross-project meetings and programmes in order to widen the knowledge among the teams on the differences and similarities between Sweden and Japan. This would also have the side effect that the networking could also be broaden to other disciplines and individuals. Cultural differences between the groups may have caused some hurdles, particularly in the start-up phase of the projects and it could be an advantage if the granting agencies organized informal discussions or workshops for the Swedish groups about these cultural differences and how to overcome them.

7 Conclusions

- International contacts are a natural and necessary element in all forefront research. The EU research system guarantees access to funding for such contacts within Europe and with collaborating countries. This is also the situation in the USA where scientific networks are well-established. This is less developed in Japan and to the emerging scientific communities in other Asian countries. Thus, we consider this effort to strengthen the scientific links to Japan as highly commendable.
- Biosciences have developed enormously during the last 30 years and the synergistic need to describe biology in exact terms demands input from other natural sciences such as mathematics, physics and chemistry. For applications in the general field of bio-economy input from more engineering types of science (such as bio-nanotechnology, bio-imaging, bio-MEMS, bioinformatics, computational biology, systems biology, tissue engineering, combinations of robotics and neuroscience, and bio-mimetics) is required. In this sense the topic of the MBD programme was well chosen and timely.
- The latest developments in the field of biotechnology have further developed and new branches have emerged so future programmes directed to this sector may require a more selective approach to keep the demand and the funding in balance.
- The groups selected to participate in the programme represented the elite of Swedish science in the sector. Hence the outcome as measured by number and quality of published papers, and to a significantly lesser degree, entrepreneurial activities, was on a high level. However, the number of joint Swedish – Japanese publications was disappointingly low, and only single examples of joint activities towards exploitation could be observed.
- In a number of cases we could see that the collaboration funded through the MBD programme has continued after the programme ended. In several cases these joint projects had actually been initiated before the MBD and were funded also through additional channels. For other projects the evidence for continuation was rather weak. The programme also aimed at broadening the Swedish – Japanese collaboration to parties not involved in the MBD funding. This aspect of the programme has not developed in the expected way.
- The budget of the individual projects under the MBD programme was rather limited. Additional funding for the actual research at both, or all, participating laboratories was an assumption from the onset. If the allocated grant was used to nurture specific collaborative efforts, in particular for mutual research stays, the budget was appropriate. However, when used for employing a graduate student or post-doc with materials within a Swedish university then there would be less finances for the Japanese collaboration. Future potential programmes should emphasize the synergistic elements and the international training aspects.
- From the reports we observe that the MBD funding was more or less well integrated in the mainstream of the grant holder. A more direct link to the major funding of the group could improve the impact. If possible, one could consider a model in which a mobility element is integrated, as an additional modality, into one or several major grants of the participating group. This could have the additional advantage to decrease the administrative burden of both the grant holder and the funding organization.
- It is in the nature of scientific activities that the actual endpoints are not known and this is even more pronounced in a total new collaborative environment such as the MBD

programme. We suggest therefore that some funding should continue to selected groups with special needs. These special needs could include economic support for transferring personnel between the countries, funding for IP, setting up legal framework around results etc.

- It is unclear why Japan was selected as the collaborative partner but in general we believe that the choice was good, but for upcoming programmes perhaps a “give and take” analysis could be made for cross-cultural-and geographical considerations. Moreover, when the geographical distance is great between the groups it is more likely that the collaborations will not happen without additional economic support.
- It is suggested that scientific groups from social and economic institutions are invited to perform research to determine the degree of success from geographically distinct scientific collaborative projects and to determine, in a systematic manner, the details of the outcome.
- For the future it is recommended that the amount of foreign exchange in actual work months is clearly expressed in both the application and reporting.

Appendix 1. List of funded projects

YEAR	APPL. NO.	FAMILY NAME	FIRST NAME	PROJECT TITLE	UN
2010	MDB10-0006	Sumpter	David	Dynamiken av biologiska transport nätverker	UU
	MDB10-0018	Laurell	Thomas	Mikrofluidisk plattform för cancerdiagnos.	LU
	MDB10-0025	Morgenstern	Ralf	Från detektion av en enzym-molekyl till tumörbehandling	KI
	MDB10-0030	Oliveberg	Mikael	Studier av ALS med in-cell NMR	SU
	MDB10-0034	Lindahl	Anders	Förbättrad plattform för utvärdering av kardiotoxicitet	GU
	MDB10-0047	Uhlén	Per	Metodutveckling för avbildning av vatten/jon flöden i celler	KI
2009	MDB09-0002	Andersson Svahn	Helene	Ett nytt bioassay system för enskilda celler och biomekanik	KTH
	MDB09-0010	von Heijne	Gunnar	'Chemical biology' studier av protein-lipid interaktioner	SU
	MDB09-0015	Langel	Ülo	Nya metoder för leverans av oligonukleotidbaserade läkemedel	SU
	MDB09-0028	Sjögren	Camilla	Det eukaryota kromatinets övergripande struktur	KI
	MDB09-0038	Elofsson	Arne	Studier av beta-barrel protein i mitokondriers yttermembran	SU
	MDB09-0052	Linnarsson	Sten	Analys av flera gener i ett flertal enskilda celler	KI
2007	2007-00243	Hohmann	Stefan	Systems Biology of signal transduction	GU
	2007-00197	Tegnér	Jesper	Identifying atherosclerosis relevant local gene networks in the macrophage	KI
	2007-00261	Widengren	Jerker	Dissecting the molecular dynamics of cell surface receptors in immune cells using state-of-the-art fluorescence-based single molecule and fluctuation techniques	KTH
	2007-00216	Borrebaeck	Carl	Development of Novel Vaccine Therapy Based on Intracellular Direct Antigen Release. Nanocarriers and Elucidation of Immunological Activation Mechanism	LTH
	2007-00249	Laurell	Thomas	Acoustic Separation of Microbial Cells Alive from Food Samples	LTH
2006	2006-00635	Nilsson	Mats	Microfluidic device for single-cell biology studies	SU
	2006-00612	Hebert	Hans	Structure of membrane proteins in eicosanoid and glutathione metabolism	KI/KTH
	2006-00640	Terasaki	Osamu	Novel transdermal drug delivery systems: Designing meso-structured materials for controlled release and triggered release	SU
	2006-00638	Sjögren	Camilla	The faithful transmission of a genome: A system biology approach	KI
	2006-00632	Hillborn,	Jöns	BMP-enriched chondroid matrix for bone regeneration	UU
2005	2005-00232	Landegren	Ulf	Single-cell analysis of transcript co-localization	UU
	2005-00223	Wahlgren	Mats	Probing the Plasmodium falciparum Genome	KI

	2005-00220	Hohmann	Stefan	Systems biology of signal transduction	GU
	2005-00244	Lundström	Ingemar	Development of Biomimetic Odor Sensors	LiU
	2005-00207	Moustaka	Aristidis	Ubiquitin-dependent regulation in signal transduction and disease - the Smad pathway	UU

Appendix 2. Programme and review committees (2004-2010)

The committees for the Swedish parties were composed of experts from multidisciplinary fields within life sciences and were representing academia and to a lesser extent industry. The geographical representation was from Stockholm, Göteborg, Uppsala and Lund.

Call 1 (VINNOVA):
Karin Markides, ordf, (Prof., Chalmers)
Staffan Normark, V ordf, (SSF)
Maria Strömme (Prof. Uppsala University)
Gunnar von Heijne (Prof. Stockholm University)
Gunnar Bjursell (Prof., Göteborg University)

Call 2 (VINNOVA):
Karin Markides, ordf, (Prof., Chalmers)
Lars Rask, V ord, (SSF)
Maria Strömme (Prof. Uppsala University)
Gunnar von Heijne (Prof., Stockholm University)
Gunnar Bjursell (Prof., Göteborg University)

Call 3 (VINNOVA):
Agneta Richter-Dahlfors (Prof., Karolinska Institute)
Stefan Löfås (PhD, GE Healthcare, Uppsala)
Maria Strömme (Prof. Uppsala University)
Gunnar von Heijne (Prof., Stockholm University)
Gunnar Bjursell (Prof., Göteborg University)

Call 4, 2009 (SSF):
Höök, Fredrik von Holst (Prof., Chalmers)
Strømme, Maria (Prof. Uppsala University)
Hohmann, Stefan (Prof., Göteborg University)
Löfås, Stefan (PhD GE Healthcare, Uppsala)

Call 5, 2010 (SSF):
Eliasson, Lena (Prof., Lund University)
Hohmann, Stefan (Prof., Göteborg University)
Höök, Fredrik (Prof., Chalmers)
Ljusberg-Wahren, Helena (Ass. Prof., Lund University)
Löfås, Stefan (PhD, GE Healthcare, Uppsala)
von Holst, Hans (Prof., KTH)

Appendix 3. Material for the evaluation

1 **Introductory material of the MDB**

- Governmental Agreement January 1999 Japan-Sweden.
- Letters between VINNOVA/SSF and JST (2004).
- Memorandum of Understanding on the Scientific Cooperation Programme between Japan Science and Technology Agency and Swedish Foundation for Strategic Research.
- The Joint Guidelines for Implementation of The Programme for Joint Funding of Swedish-Japanese Cooperative research Multidisciplinary Bio, 15 December 2008.
- Guidelines for the final report. SSF, 2009-09-28.

2 **Material/documents of planning and launching of the MDB**

- Five call texts.
- Template – Contract between SSF and funded organization (project).
- List of all applications-name of project/Universities/Project leader.
- List of all funded projects including contact information in Sweden and Japan.
- List of members in the Swedish programme Committees including contact information.
- Minutes from all meetings in the joint Japanese-Swedish Programme Committees.
- Minutes from all meetings in the Swedish Programme Committees.
- Decisions by SSF and/or VINNOVA on management or board levels of importance for MDB.

3 **Results from the projects in the MDB**

- Final reports from all projects.

Appendix 4. Summary of the guidelines for the evaluation panel

Aim of the evaluation

The aim of this evaluation is to get insight on the value of this kind of international cooperation both from a scientific and from a societal and industrial point of view. To what degree has the programme fulfilled its aims? The main focus is on the Swedish research environments and their interactions with the Japanese partners. The aims can be divided into four major dimensions or perspectives relevant for this evaluation:

- Scientific achievements and successes
- Entrepreneurial achievements and successes
- Cooperative achievements (human capital)
- Potential for continuity and duration after the programme period

The aim of the evaluation is also to look upon the administrative, communication and organizational set up of such programme between two Swedish organizations, one Japanese organization and the projects. Is the selected mode of support appropriate for international collaboration?

Methods of the evaluation

SSF and VINNOVA have decided that the programme evaluation should be executed by a programme evaluation committee (PEC) of three persons. One person should be the chair of the PEC and two persons should be expert in the research fields. The PEC has the freedom to select methods and considering how they should be designed in detail. SSF and VINNOVA recommend the committee to consider the common methods: Bibliometric analysis; Interview method; Questionnaires; Analyze the final reports and other written documents of importance. PEC is free to specify appropriate indicators. PEC decides which and to which extent these will be used in the evaluation.

Responsibilities for the Programmeme Evaluation Committee, funding organizations, programme committee and individuals in the projects during the time of the evaluation implementation

The PEC is independent in relation to the projects, funding organizations and programme committees. The report of the evaluation shall only be a result of the PEC and its findings. All conclusions and recommendations are only PEC responsibility. The PEC has overall responsibility for the task of designing; administrate (implement) and analysis of questionnaires, bibliometric data and interviews. Prior to delivery of the final report to the SSF takes factual examination by SSF / VINNOVA and projects to the extent appropriate. The PEC administrates the fact finding considerations. All key members in the projects must be prepared, in reasonable proportion, to allocate time for interviews and/or to answer the questionnaire. Projects and

funding organizations should, where possible provide documents and background information of importance for the evaluation, e.g. final reports from projects and scientific publications.

Appendix 5. Final report forms (SSF and VINNOVA)

Report Form from SSF

Guidelines for the final report

The final assessment of the scientific quality and the strategic relevance of a programmeme will provide feedback necessary to the Foundation to improve its support for Swedish research. It is carried out after the formal end of the project and will be an important receipt to the project management.

The final report of an SSF project should be completed – to the extent possible – and delivered to the Foundation at the end of the project. The purpose of this report is to provide a basis for the final assessment of the project. The report should also serve as the primary reference for future discussions about the project, and thus be an important document for posterity. It should contain a comprehensive account of the history and the activities of the project. Note that the headlines below are not relevant for all type of grants – please adjust to reflect your project. For example, less information is required for an individual grant than for a Strategic Research Centre as the former has no Steering group, etc.

The report shall be written in English and is uploaded (pdf-format) in connection with the final annual report in the SSF application portal found at: www.stratresearch.se

Table of contents
Summary
An executive summary of the report (1 page).

0 The objective(s) of the project
What the project was supposed to be about (compared to what it actually was about). Throughout the report comments on the position and results achieved compared with the objectives, milestones, and deliverables expressed in the proposal/modified research plan/etc should be included.

1 History of the project
The history of the project with emphasis on:

1.1 The conception of the project, the background, motivation and original vision. Describe briefly the larger setting of the project, i e how it has complemented other activities of the participating research groups, incl. their financing, and how this has varied from the beginning to the end. Please indicate the level of project funding as overall share of participants' funding during the project.

1.2 The basic organization, relation to other grants etc.

1.3 The changes made to the project during its period. In particular, which changes were induced by the mid-term evaluation carried out by the Foundation? By other evaluations?

1.4 List the members of the project steering group (if applicable) in appendix A1 and their activities and responsibilities, as specified by the project, in appendix A2.

2 Scientific results of the project

A description of the research of the project and the different projects. The following aspects are relevant:

2.1 Describe the scientific approach and the results compared to the scientific objectives. List all projects here that have been part of the project at any time, and identify the researchers involved in each project. Include a short presentation of the scientific results of each project. Comment on their degree of scientific success and explain briefly why some projects have been discarded/omitted before fruition (if any).

2.2 List participating researchers (senior researchers, postdocs etc.) as appendix A3. Include university and department, type of position, year-of-birth and gender. Specify also new recruitments made and describe the competition in the recruitment process. Comment upon gender equality aspects (e g efforts to increase the number of women in leading positions). Have resources been moved (compared to the original proposal/plan) from one research group to another during the granting period? Why?

2.3 Enclose a list of selected publications pertaining to the project as appendix A4. The list should include only those publications in which the contribution from the Foundation is acknowledged. Include a bibliometric analysis comparing the situation at the beginning and the end of the project.

2.4 Describe the most important activities (conferences, work shops, summer schools, industry meetings, …) here, and include a full list of events as appendix A5.

3 The "graduates" of the project

A brief description of the graduate training in the project. At least the following aspects are relevant:

3.1 Has the project contributed to an improved graduate training? List all new courses developed specifically for the project in appendix A6, and describe briefly their characteristics compared to previously available courses. For each course, specify the number of internal and external participants (cf 5.3). Consider also effects on undergraduate education.

3.2 Which younger researchers have been able to establish themselves as independent group leaders in academy or research leaders in industry as a result of the project?

3.3 List the students and their exams (or lack of) in appendices A7-A10

4. Impact of the project – to industry and society

4.1 Describe the industrially or societally relevant results of the project. List the innovations and prototypes that have been produced, spin-off companies founded or being contemplated, etc in appendix A11.

4.2 How has the project ensured that the people and research produced within the project are utilized by the society, by industry?

4.3 Describe the collaboration with industry and other parts of society (supervision, mentoring, contracts for joint projects, innovations and prototypes based on research performed within the project, etc.)

4.4 Describe the intellectual property rights developed by the project. List the patents and pending patent applications in appendix A12.

4.5 Which research results of the project have been [or will be within six months of the project's contractual expiration] implemented by industry/society?

4.6 Which activities, publications, etc have been directed towards the general public or to younger people?

5 Impact of the project – to the academic system

5.1 Describe the scientific collaborations between different disciplines and departments (shown in joint subprojects, publications etc.).

5.2 Describe the cooperation between the universities originally involved in the project as well as with other universities (both scientific and administrative aspects).

5.3 Describe the cooperation with other Foundation projects (joint courses, meetings, projects, etc)

5.4 Describe the international collaboration, including participation in EU projects (shown in mutual projects, regular exchange of researchers, shorter visits etc.)

5.5 Describe the project contributions to the mobility of students and researchers

5.6 How has the project improved academic research? Which parts of the project do you consider your most valuable contributions to the total research system in Sweden?

5.7 What has the project meant to the researchers in the project? New research directions, new types of collaborations etc could be relevant here. List any awards presented to participating researchers in appendix A13.

5.8 Describe the relations with the host university and other participating universities.

5.9 What has the project meant for the universities locally?

5.10 Has the project contributed to improvements in the handling of immaterial rights at the universities?

5.11 What changes in the university system have been induced by the project?

6 Lessons from the project

What are the main lessons learned from the project? What are its most important, scientific as well as non-scientific, achievements and shortcomings?

7 Outlook

7.1 What will happen to the project?

7.2 Give a long term perspective on the field of the project. Will the project appear important ten years from now? Why?

8 Economic report

A summary of the annual economic reports earlier presented to the Foundation should be presented, see below. If relevant, please comment on the overall distribution to sub projects. If relevant, please comment on other funding that has been granted to the project.

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	SUM
PI SALARY						
SENIORS SALARY						
POSTDOCS SALARY						
PHD:S SALARY						
EQUIPMENT						
MATERIAL/TRAVELS						
EXPLOITATION OF RESULTS						
ADMINISTRATION						
INFORMATION						
OTHER COSTS						
SUM COSTS						
OVERHEAD						
% OH						
VAT						
% VAT						
SUM INCL OH AND VAT						

A Appendices

A.1 A list of everybody who has at any time been a member of the project steering group including affiliation and their period.

A.2 A list of the activities and responsibilities of the steering group (if any)

A.3 A list of the researchers (senior researchers, postdocs, …) including university and department, type of position, project, year-of-birth and gender. (NB. Students are the subject of appendix A.7-9)

A.4 A list of selected publications (books, articles in refereed journals, papers presented at conferences, reviews, other publications). Indicate clearly publications with international and/or industrial co-authors. What is the cross-national share? The cross-university share? The cross- departmental share? The cross-project share? Only publications where SSF funding is relevant and thus duly acknowledged should be included.

A.5 A full list of events organised by the project (conferences, work shops, summer schools, industry meetings, …)

A.6 A full list of all graduate/post-graduate courses developed within the project.

A.7 PhD exams. Enclose an updated list of students who have completed their PhD. Include at least year of birth, gender, thesis title, supervisor(s), university department, year of degree, university of basic academic training, total amount of Foundation funding received, and employer six months (or at a later time if available) after exam.

A.8 Lic exams. Ditto for students who have completed a licentiate exam.

A.9 Future exams. Enclose a similar updated list of students who have been at any time financed by the Foundation, but who have not yet completed their exam. Specify also the expected time for exam and the reason why they have not completed their exam yet.

A.10 No exams. Enclose a similar updated list of students who have been at any time financed by the Foundation, but who are no longer expected to complete their exam.

When appropriate, specify their employer six months (or an available time) after their leave.

A.11 A list of innovations and prototypes that have been produced, spin-off companies founded or being contemplated, etc

A.12 A list of patents awarded or pending. Specify any exploitations or plans for exploitation, etc.

A.13 A list of awards to participating researchers, etc.

In addition to the official document, and for the general learning process of the Foundation only, we are interested in obtaining the personal reflections of the project leader and the chairman of the project steering group. These reflections could take any form, but the following questions are of interest to us and could perhaps be suggestive:

B Questions for the Project leader(s)

B.1 If the project had been set up today, what changes would you have made to it given everything that you now know [apart from the research results, of course]?

B.2 What – if anything – will ultimately be the main impact of the project on society and academy?

B.3 What do you expect will happen [What has happened…] to the activities within the project after the Foundation funding has expired?

B.4 What were the problems of the project?

B.5 What was the most fun with the project?

B.6 Your main complaints and appreciations of the Foundation?

B.7 Your view of the project steering group and its role?

C Questions for the Chairman(-men)

C.1 If the project had been set up today, what changes would you have made to it given everything that you now know?

C.2 What – if anything – will ultimately be the main impact of the project on society?

C.3 What do you expect will happen [What has happened…] to the activities within the project after the Foundation funding has expired?

C.4 What were the problems of the project?

C.5 What was the most fun with the project?

C.6 Your main complaints and appreciations of the Foundation?

C.7 Your view of the project leader and his/her role?

Report form from VINNOVA

Slutredovisning

Slutredovisningen sänds in elektroniskt. Sänd även in ett underskrivet pappersoriginal till VINNOVA, 101 58 Stockholm.

Diarienummer
XXXX-XXXXX

Projekttitel
TESTRAPPORT

Projektledare

Bidragsmottagare
Testman Testson
112233-4455 Organisation
Arbetsplats

VINNOVAs handläggare
TEST

Assistent på VINNOVA

Startdatum
2015-10-07

Slutdatum
2015-10-07

Sänd in senast
2015-10-07

VINNOVAs bidrag totalt
120 000 kr

** Obligatoriska fält*

E-post till Prefekt/firmatecknare *
#txtfld_email_no_vinn#

Övrig mottagare av e-post
#txtfld_email_no_vinn#

1. Sammanfattning av projektet och dess resultat *
108774

2. Hittills utgivna publikationer, kan även redovisas i separat bilaga
108777

3. Annan resultat- och kunskapsförmedling
10878

4. Lägesredovisning i enlighet med särskilda villkor. (Samfinansiärers och samarbetspartners ekonomiska insatser redovisas nedan i ”Samfinansiering enligt villkor".)
108783

5. Ekonomisk slutredovisning av VINNOVAs bidrag *
VINNOVAs bidrag totalt:
Total medelsförbrukning:
Därav förvaltnings- och lokalkostnadspåslag:
Andra administrativa påslag:

Överskott skall återbetalas till VINNOVA, postgiro 78 80 62-8 med angivande av diarienr på talongen.

** Obligatoriska fält*

Bilagor

Bilagor, uppladdning av filer.
Så här gör du när du ska ladda upp en bilaga: Klicka på knappen "bläddra" och välj den fil på din dator som ska laddas upp. Klicka på knappen "överför fil" så laddas dokumentet upp till VINNOVAs server (det kan ta en liten stund).

Bilagor [1)]

Revisorsintyg [2)]
Om Bidragsmotagaren får tre (3) miljoner kronor eller mer i bidrag från VINNOVA ska revisorsintyg från auktoriserad/godkänd revisor bifogas slutrapporten.

[1)] Max storlek för en bilaga är 10 mb. Information om vilka filtyper som är tillåtna att ladda upp som bilaga finns i frågor och svar.
[2)] För kommun, landsting, statliga myndigheter, universitet och högskola accepteras också revisorsintyg från internrevisor. Revisorsintyg ska även bifogas rapport om VINNOVA så särskilt begär. I revisorsintyg intygar revisor att redovisade kostnader för projektet hämtats ur Bidragsmottagarens redovisning under Dispositionstiden, att kostnaderna är verifierade (styrkta) och att Bidragsmottagarens redovisningsrutiner är utformade i enlighet med god redovisningssed.

Projektresultat

Alla frågor måste besvaras med minst ett kryss

1. VINNOVAs bidrag till projektet/etappen innebar att: *
109431projektet/etappen överhuvudtaget kunde startas och/eller slutföras
109434projektet/etappen kunde genomföras med större effektivitet än annars
109436projektet/etappen fick just denna inriktning och uppläggning
Kommentera bedömningen i fältet
109437

2. Projektet/etappen har på ett tydligt sätt skapat nära samarbetsrelationer mellan aktörer från följande kategorier, inom Sverige och/eller i samarbete med partners i andra länder: *

Aktörer Sverige	Aktörer i andra länder
09459Universitet/Högskolor	109456Universitet/Högskolor
109463Företag	109462Företag
109467Politiska beslutsfattare	109466Politiska beslutsfattare
109472Offentlig verksamhet	109473Offentlig verksamhet
109476Institut	109477Institut
109479Ej relevant	

Kommentera bedömningen i fältet
109483

3. Projektet/etappen har inneburit att projektdeltagare har flyttat anställningsmässigt (på heltid eller deltid) mellan aktörer i innovationssystemet: *

Från	Till
109502Universitet/Högskola	109503Universitet/Högskola
109507Företag	109506Företag
109509Politik	109508Politik
109518Offentlig verksamhet	109517Offentlig verksamhet
109522Institut	109521Institut
109526Ej relevant	

Precisera och kommentera i fältet
109531

4. Inom forskarsamhället har projektet/etappen resulterat i: *

109552Nytt forskarnätverk	109553Licentiatavhandling(ar)	109554Ny vetenskaplig metod
109558Nytt institut	109559Examensarbete(n)	109560Ny vetenskaplig teknik
109565Ny centrumutbildning	109564Professur/adj Professur	109568Vetenskapliga publikationer
109570Ny institution/avdelning	109571Gästprofessur/gästforskare	109572Vetenskapliga konferenser
109578Nytt forskningsprogramme	109579Doktorandtjänst(er)	109580Vetenskapliga konferensbidrag
109584Ny forskarutbildning	109585Industridoktorand(er)	109586Ej relevant

5. Utanför forskarsamhället har projektet/etappen resulterat i: *

109612Immaterialrätter	109613Ny praktisk metod	109614kommersialisering
109618Produkt, system, programme	109619Tekniköverföring	109620Nytt/nya företag
109624Prototyp	109625Publikationer för praktiker	109626Nytt/nya företagsnätverk
109630Demonstration	109631Utbildning för praktiker	109632Organisationsförändring
109636Produktutveckling	109637Seminarier för praktiker	109638Underlag för politiska beslut
109642Andra policyunderlag	109645Ej relevant	

Årlig uppföljning av data

** Obligatoriska fält*

1. Har det etablerats kunskapsintensiva företag eller avknoppningar i projektet under de senaste tolv månaderna? *

Ej relevant	109661
Från akademien	
från större företag (>250 anställda)	
annat ursprung	
Totalt antal	**0**

2. Finns det doktorer som har examinerats i projektet under de senaste tolv månaderna? *

Ej relevant 109689

Kvinnor		**Män**	
helt finansierade av VINNOVA:		helt finansierade av VINNOVA:	110 220
delfinansierade av VINNOVA:		delfinansierade av VINNOVA:	110 221
ej finansierade av VINNOVA:		ej finansierade av VINNOVA:	110 223
Totalt antal kvinnor	**0**	**Totalt antal män**	**0**

3. Har forskare som disputerat högst två år före projektstart deltagit i projektet med stöd av VINNOVA? *

Ej relevant 109735

Kvinnor		**Män**	
<26 år	109750	<26 år	109 752
26 - 30 år	110 224	26 - 30 år	110 225
31 - 35 år	110 226	31 - 35 år	110 227
36 - 40 år	110 228	36 - 40 år	110 229
>40 år	110 230	>40 år	110 231
Totalt antal kvinnor	**0**	**Totalt antal män**	**0**

4. Finns ett genusvetenskapligt perspektiv integrerat i projektet? *

109778

Datum

Underskrift person behörig att teckna

Bidrgsmottagarens firma eller annan person behörig att underteckna kontrakt (i de fall det krävs fler än en person)

Namnförtydligande

Titel

Appendix 6. Summary of Final Reports from the Swedish Project Leaders

2005-00207 Moustakas

Research Project

The main goal is to exploit ubiquitin-based mechanisms in the transforming growth factor beta (TGF-beta)-Smad signaling pathway since Smads are most frequently implicated in human disease.

Scientific Synergy

The report gives two rather high level manuscripts, however, both publications are without authors from the Japanese laboratory. The Japanese collaborators were acknowledged in the manuscripts for their technical support.

Entrepreneurial Achievements

No entrepreneurial achievements were reported.

Cooperative Achievements

The report states that several meetings took place between the partners. However, it is not clear whether there is an added value for Swedish science. From the report it appears that corresponding technology is available in Sweden and Uppsala. The report states that the Swedish party, Markus Dahl (graduate student) learned a bio-imaging application to the identification of new receptors, and that many of the GFP constructs were made by Peter Lönn in Tokyo.

Continuity

The Swedish group did not receive continued funding from SSF-Vinnova but has managed to continue their collaboration with their Japanese colleagues. After the completion of the MDB project the bi-lateral activities between Profs. Miyazono and Moustakas have continued. The start of a new research group by Kohei Miyazono at the Ludwig Cancer Research in Uppsala has contributed to the continuation of bilateral activities. Furthermore, a special grant: Core-to-Core Programme (Japan-Sweden-The Netherlands), that Prof. Miyazono received from the Japan Society for the Promotion of Science that has been active from April 1, 2010 until March 31, 2015 contributed catalytically to further interactions. Aristidis Moustakas: Visiting Professor, University of Tsukuba, Japan, 2012-present.

2005 – 00220 Hohmann

Research Project

The focus of this project is to develop a toolbox for the quantification of the yeast signal transduction system. The Hohmann lab has its expertise in molecular biology with emphasis on yeast while the Japanese partner brings in expertise on Biocomputing. The specific aims are to build the initial network map of the yeast signal transduction system; to develop and improve

tools for collecting quantitative experimental data; and to collect and retrieve experimental data to facilitate modelling.

Scientific Synergy
No joint publications are reported during the project period but several are stated to be in the pipeline.

Entrepreneurial Achievements
No entrepreneurial aspects were included in this collaboration.

Cooperative Achievements
The partners have jointly organized international conferences on systems biology, they have been instrumental in setting up the International Society of Systems Biology and they were granted a continuation on the MDB grant. Hohmann reports that this collaboration was made possible due to the MDB grant. The overall collaboration seems to be running on significantly higher budget.

Continuity
Post-docs have been making bi-lateral visits.

2005 – 00223 Wahlgren

Research Project
The main aim of the project is to use a combined bioinformatics and genomics approach to understand the mechanisms by which the malaria parasite Plasmodium falciparum evades the immune system and exerts its pathogenicity.

Scientific Synergy
The scientific synergy was built on molecular biology in Sweden and biocomputational tool development in Japan. This collaboration generated a series of tools with which to probe the mechanism of pathogenicity of malaria as well as a number of human pathogens. The collaboration has lead to 3 publications with both Swedish and Japanese authors.

Entrepreneurial Achievements
None.

Cooperative Achievements
The major outcome is a publicly available database on malaria genetic variations which may, in the future, aid in choosing correct medication for patients. This concrete deliverable is not assumed to create a basis for entrepreneurial activities and should be considered as a community benefit. Both parties apparently mostly has worked in their own environments, with good joint results, the low funding level in the MDB grants has been enough for this kind of collaboration.

Continuity
Yes, in the form of publications and continued work on the database.

2005-00232 Landegren

Research Project

Ulf Landegren runs a very innovative research programme in nucleic acid analysis and coupled protein / NA analysis. The Japanese partner has expertise in very large scale biomolecular analysis.

Scientific Synergy

The report states that the MDB grant has been important for initiating collaboration between the two laboratories and an exchange of scientists has taken place. Two publications have been published but without any Japanese authors.

Entrepreneurial Achievements

None.

Cooperative Achievements

Ulf Landegren has been part time employed as Senior Visiting Scientist at the RIKEN Institute for the facilitation of their bilateral collaboration. Personnel from both sides have been working in each other's laboratories for several months at a time and the groups have organized conferences together.

Continuity

Prof. Landegren remains a Fellow at the School of Engineering at the University of Tokyo and since 2004 he is also Senior Visiting Scientist at the RIKEN Institute. He has recently initiated collaboration with Dr Hayashizaki concerning the Exciton probes that they have developed and which we wish to apply in our molecular detection reactions.

2005-2044 Lundström

Research Project

The aim of the project was to develop new methods to study constructing surfaces and thin films that would be used for biomimetic odor sensors that can detect volatile compounds with high specificity.

Scientific Synergy

The Swedish partner was constructing thin film materials and the Japanese partner analyzed the binding of compounds to these surfaces. There is one joint publication reported and then 5 publications from the Japanese group (without any Swedish authors) and 2 publications from the Swedish group.

Entrepreneurial Achievements

The Swedish partner does not report any commercial activity but the Japanese group has initiated steps towards the commercialization of the odor-sensor detector.

Cooperative Achievements

No details are given on how the collaboration was organized. There were apparently no joint seminars or exchange of scientists or any visits. Material was exchanged as the surfaces were made in Sweden and analyzed in Japan.

Continuity
No response

2006-00612 Hebert

Research Project
The Hebert group works on the technically difficult problem to solve the 3-d structure of membrane proteins. They have used an approach with 2-d crystals and cryoelectron microscopy.

Scientific Synergy
Several high quality papers are reported and a patent application has been filed. However, these papers do not include any Japanese partners. There is no indication of added value to the group.

Entrepreneurial Achievements
One Swedish patent without Japanese partners.

Cooperative Achievements
Not apparent

Continuity
No response.

2006-00632 Hillborn

Research Project
Hillborn works on novel hydrogels, which with suitable growth factors are used as matrix for bone reconstruction.

Scientific Synergy
The work seems to be in a rather early phase and two manuscripts are reported, both without Japanese contribution. The MBD grant has been used to allow a Swedish clinician to work part time on the material science group. From the report it appears as if the Japanese role in the project deals with studying bone recognition in animal tests. No results were obtained at the time of reporting.

Entrepreneurial Achievements
Hillborn reports one patent application but apparently without Japanese inventors. A new Swedish company, Termira AB, has been founded based on the results of the project.

Cooperative Achievements
The Japanese collaboration is stated to be academic. The report states two visits to Japan and collaboration with the University of Nagoya. Also a potential collaboration with U Tokyo is mentioned.

Continuity
Three publications are reported where two of them include Japanese co-authors but it is unclear if they are from the original constellation of Japanese partners. Hilborn was World President of a conference (TERMIS) that was held in Tokyo during 2007.

2006-00635 Nilsson

Research Project

This project is a three-party collaboration with clear roles for each laboratory. The aim is to create a single cell analytical system based on a microfluidic device. The Nilsson group works on the actual biology, the Landegren group in Uppsala works on the analytical system and the Japanese partner in Tokyo is responsible for the microfluidic part.

Scientific Synergy

The groups have 3 joint publications and several conference presentations with joint authors.

Entrepreneurial Achievements

No immediate entrepreneurial achievements.

Cooperative Achievements

The first joint conference paper is presented one month after the onset of the project. Still the report states that the MBD was instrumental to start the collaboration. It could be questioned whether this grant played any major role for the collaboration. There have been bilateral visits to learn techniques and discuss the projects. These exchanges occurred a few times each year. They have also presented research findings at conferences.

Continuity

Five joint publications have been published after the cessation of funding and one manuscript is being written. In addition two Japanese researchers visited Uppsala on different occasions during 2009-2011. Mats Nilsson has received joint funding from a NEDO grant 2009-2011 together with Kae Sato, Japan Women's University.

2006-00638 Sjögren

Research Project

The project aims to study cellular events following DNA damage and repair mechanisms.

Scientific Synergy

From the report it cannot be concluded what role the Japanese group has played but the two groups have had an established collaboration before the start of the MDB. Sjögren´s post-doctoral studies were performed in the Japanese laboratory. The have a joint publication in Science in 2007.

Entrepreneurial Achievements

No immediate entrepreneurial achievements.

Cooperative Achievements

It is difficult to evaluate what role the Japanese group actually contributes with. The interactions between the two groups have been very active in the form of laboratory visits and exchange of techniques.

Continuity

A student of Sjögren´s has visited Dr. Shirahige at Tokyo University several times to run experiments and Dr. Shirahige has visited Sweden twice. Moreover, there are 4 high impact

joint publications from this collaboration (PLoS Genetics, Nature Review, J Biol Chem and Nature). One Swedish student is planning to do a post doc in Japan. The collaboration continues to work in studying the relationship between DNA and chromosome structure.

2006-00640 Terasaki

Research Project

Novel transdermal drug delivery systems. Transdermal delivery of drug is an attractive way of drug delivery but is more or less successful depending on the drug's physicochemical properties. In this project efforts are made to deliver peptides and to use novel mesoporous silica.

Scientific Synergy

A joint paper with the Japanese group has submitted at the time of the report.

Several visits to Japan from members of the Swedish group and a seminar was organized in Sweden that included partners from several countries including Japan.

Entrepreneurial Achievements

The groups have also jointly filed for a patent, with priority taken in Japan.

Cooperative Achievements

Swedish group traveled to Japan for discussions and there was a joint meeting in Stockholm together with adjunct groups (Spanish, Chinese).

Continuity

1 publication

2007-00197 Tegner

Research Project

The goal of the project is to identify relevant local gene networks in the macrophage. Specifically, this project aimed at creating a map for gene expression patterns which are relevant for atherosclerosis.

Scientific Synergy

Two high impact joint articles (Cell, Nature Genetics) have been published. These two publications are the efforts from two large groups (FANTOM consortium and the RIKEN Genome Exploration Research Group) and contain more 50 and 150 authors each.

Entrepreneurial Achievements

This project did not aim for entrepreneurial achievements but should have clear potential to have implications on diagnostics.

Cooperative Achievements

The Riken genome exploration group in Japan seems to have been the leading and coordinating laboratory in this effort. The Swedish group performed molecular assays to validate a procedure and then the Japanese group will test this protocol on living cells. Bilateral visits were made.

Continuity
Continuity is indicated by the fact that the consortium has got further funding through FP7.

2007-00216 Borrebaeck

Research Project
The development of a new vaccine based on intracellular antigen release from nanoparticles.

Scientific Synergy
The Japanese partner contributes the nanoparticle competence and the Swedish partner contributes with competence in immunology. The collaboration gave rise to two joint publications.

Entrepreneurial Achievements
Collaborations with two companies have been made for development of products related to the findings of the study. Clinical studies have been initiated on basis of the results.

Cooperative Achievements
The results indicate that nanoparticles have an effect as adjuvants and that protein coated nanoparticles can be delivered as a nose spray and that this stimulates the immune system. This potential application has led to an interest from Japanese (Taiho Pharmaceuticals Co., Ltd) and a Swedish company (Alligator Bioscience). A doctoral student spent one year in Japan learning nanotechnology and a Japanese doctoral student spent 7 weeks in Lund. Another Japanese scientist visited Lund for practical and theoretical work. In addition, there were 4 project meetings with both partners present. During these meetings a Swedish company and a Japanese company participated.

Continuity
For continuation it is stated that one full time doctoral student has been employed at Lund. The role of the Japan partner in continuation is not reported.

2007-00243 Hohman

Research Project
This is a continuation of the 2005-00220 projects on systems biology of signal transduction.

Scientific Synergy
The partners have built a sustained collaboration on bioinformatics with the Japan partner contributing with sophisticated computer science and the Swedish partner the molecular data. They have built an international community around this collaboration. They report 1 joint published paper, 2 manuscripts and a number of conference presentations and posters.

Entrepreneurial Achievements
No direct entrepreneurial achievements were expected.

Cooperative Achievements
The project has stimulated Swedish research in bioinformatics in general and also brought in a number of other grants to the partners. There has been the development of novel tools and

improvements on existing tools. They have organized a workshop on Systems Biology where both partners were present as well as invited speakers. The partners met at conferences.

Continuity
The partners are founding members of a society for Systems Biology and they organize jointly conferences so the collaboration shows stabile continuity. They state that the collaboration will continue by joint publishing and additional tool developments.

2007-00249 Laurell

Research Project
Acoustic separation of living microbes in food. The project is in collaboration with Japan and the Danish Food Industry.

Scientific Synergy
No joint publications are reported.

Entrepreneurial Achievements
The studies have resulted in two patent applications, a Swedish and Japanese. The Swedish patent was authored by the Swedish group only and apparently the Japanese patent was authored by the Japanese group. It appears as if these patents are not applied jointly.

Cooperative Achievements
The reported technology seems valuable, but added value from the Japan collaboration is questionable. They have had one joint conference contribution. The parties have exchanged scientists and held several meetings. It is unclear if there is a true knowledge transfer.

Continuity
After closing the programme we have manufactured a new generation rare acoustophoresis cell separation chips that include separation and concentration information. These chips are fully compatible with the dielectrophoresis cell trapping array that has been developed in Teruo Fuji Lab.Dr. So Hyeon Kim from Teruo Fuji Lab was in Lund for one week in 2015 to get training and perform experiments on the new integrated system with rare cell separation, enrichment and diectrophoresis cell trapping. The new chip generation comprises several versions that will be evaluated in Lund and in Tokyo.The groups are finalizing a manuscript for publication that deals with the development of the joint integrated acoustophoresis and dielectrophoresis system that was accomplished during the project period. AcouSort AB is currently developing a generic microfluidic platform that can host different acoustophoretic configurations and minor modification of this platform may yield a prototype instrument for the tumor cell separation, enrichment and trapping platform.

2007-00261 Widengren

Research Project
This project deals with advanced fluorospectrometic methods that allow dynamic co-diffusion of specific proteins to be followed in living cells.

Scientific Synergy
The synergistic value of the Japanese partner is difficult to estimate since this aspect is not dealt with in the report. However, the partners have organized several international workshops. The Swedish-Japanese collaboration can be observed by one joint conference abstract, the topic of which is to be expanded into a journal paper (see below under Continuation).

Entrepreneurial Achievements
This project did not aim at applications which could be explored.

Cooperative Achievements
A major tool was developed using fluorescence cross-correlation spectroscopy.

Continuity
The joint project continued after the funding period and resulted in one joint publication. After the project period, several scientists from the apanese group visited the lab at KTH for up to three weeks. Prof Kinjo visited the lab at KTH to initiate plans for a joint summer school/ workshop between KTH and Hokkaido University and KI in 2016.

MDB090002-Andersson-Swahn

Research Project
Novel bioassay system for single cells and cell biomechanics. The main objective of this project is to develop a bioassay system consisting of an active microfluidic device integrated on a microwell slide for high throughput single cell analysis.

Scientific Synergy
The collaboration is based on a clear synergy. The Japanese laboratory develops the technical devices and the Swedish partners run the biological experiments. The collaboration has been successful and they report 4 joint articles.

Entrepreneurial Achievements
No entrepreneurial aspects have been reported.

Cooperative Achievements
This is an obviously successful project from the point of the MDB programmeme. They have developed a novel bioassay system designed for single cell analysis.

Continuity
The Japanese collaboration did not continue after the funding ended.

MDB09-0010 von Heijne

Research Project
This project is an advanced and fundamental study on biophysical chemistry. The aim is to study the thermodynamics of membrane protein folding.

Scientific Synergy
This allowed for a series of high impact papers, however, only two publications includes Japan authors.

Entrepreneurial Achievements
This has been a fully theoretical study and no direct entrepreneurial achievements could be expected.

Cooperative Achievements
The strategy adopted by the Swedish group was to incorporate nonbiological amino acids and measure their effect. This required the synthesis of charged tRNA, a method provided by the Japanese group. This collaboration got an essential catalytic kick from the MDB programme. The necessary technology was used by Swedish graduate students in Japan and the reagents and synthesis technology was brought to Sweden.

Continuity
The collaboration with Prof Suga in Tokyo continues within a small grant from Vinnova-JSPS, and have data for a new paper that will be written up during 2015. Prof Suga visited Stockholm recently.

MDB09-0015 Langel

Research Project
Oligonucleotides are of high interest as potential novel drugs since they affect gene expression and translation. The delivery into the cell is problematic due to the high hydrophilicity and the size of nucleic acids. In this project the problem with cell permeability is studied and the use of peptides to aid in penetration is being investigated.

Scientific Synergy
The report lists several joint publications (n=5), and also a number of Swedish publications. The success in this project is apparently based on the synergistic competencies between partners, rather than an exchange of techniques or reagents.

Entrepreneurial Achievements
Even if the ultimate goal in a project of this kind is new drug concepts it has not resulted in any entrepreneurial achievement.

Cooperative Achievements
Two laboratories in Stockholm and three in Kyoto were involved and each contributed with different technologies. This specific project is based on a previous collaboration between the labs. The parties have met at three seminars, but there is no report on laboratory visits by e.g. doctoral students.

Continuity
Two joint publications have been published after the cessation of the funding period. Additionally, Futaki's group is involved in writing a Chapter to the novel book on cell-penetrating peptides and edited by Langel (Springer 2015, in press).

MDB09-0028 Sjögren

Research Project
The aim of this study is to understand chromosome replication, segregation and repair.

Scientific Synergy
Both parties at KI and University of Tokyo have been collaborating for years before being granted the MDB project. The Swedish team has provided expertise *in vivo* analyses in yeast, chromosome topology and repair. The Japanese contribution is related to high throughput, genome-wide analysis, bioinformatics and the human system.

Several papers are reported from this programme, however only one with authors from both labs (a high level full Nature paper), and one manuscript.

Entrepreneurial Achievements
This project did not aim at applications, but to the understanding fundamental mechanisms.

Cooperative Achievements
There have been frequent visits, in particular of graduate students from Sweden to Japan to learn techniques, and also several meetings between the PIs. A student from the Sjögren lab is now doing a post-doc in Japan.

Continuity
Bilateral visits are still ongoing. In addition, the groups have an additional 4 joint publications that are published in high impact journals. The collaboration continues to be very productive.

MDB09-0038 Elofsson

Research Project
Studies of mitochondrial beta-barrel outer membrane proteins.

Scientific Synergy
The group at AIST in Japan lead by Paul Horton are experts in identification of mitochondrial proteins, and the Nagoya group, lead by Toshiya Endo, provides experimental data about protein-protein interactions between mitochondrial proteins. The report presents a number of papers, however, only one methodological paper with joint authorship. Hence, the actual scientific synergy in solving the biological questions appears weak.

Entrepreneurial Achievements
The nature of the addressed questions was not a basis for entrepreneurial activities.

Cooperative Achievements
Two meetings with PIs from several MDB projects are reported. Further several graduate students from Japan had the opportunity to visit the lab in Stockholm providing valuable input and discussions to the visiting students and to the PhD students in Stockholm.

Continuity
An informal collaboration between Paul Horton and Arne Elofsson has continued by regular meetings and skype contacts, as a result of these Elofsson will visit Japan as a keynote speaker at GIW/InCoB 2015 in Tokyo. One joint publication that describes the final outcome of the project has been submitted 2015.

MDB09-0052 Linnarsson

Research Project

This project is in collaboration between Linnarssons lab at KI and one of the major developers and producers of analytical instruments for nucleic acid analysis (R&D at Hitachi). The project aims at profiling gene expression in single cells. The aim was the exchange of technologies between the two partners.

Scientific Synergy

No joint publications are reported. The Swedish group reports 3 high quality papers.

Entrepreneurial Achievements

One patent application by Swedish investigators. Industrial contacts with two companies, both forefront developers operating from the US have been made. These companies are Illumina and Fluidigm.

Cooperative Achievements

It remains unclear what the actual benefit to Sweden has been from this MDB project. No joint publications are reported (this could be due to Hitachi´s publishing policy). It is not clear to what extent younger Swedish scientists have been able to interact with the Japanese side or vice versa.

Continuity

The main activity has been exchange of materials (specific reagents that are not commercially available), that the Swedish partner has obtained from the Japanese collaborators.

MDB10-0006 Sumpter

Research Project

The main goal was to study the dynamics of biological transport networks. The Swedish group has studied the transport of nutrients in strains of slime molds and the Japanese group builds mathematical models. This work can result in the novel development in computer memory circuits.

Scientific Synergy

This is a continuation of a larger project between the Sumpter and the Nakagagi labs that was originally funded by the Human Frontiers Science Programmeme. Actual experiments have been done independently and with other funding mechanisms.

The Japanese contribution is more on the mathematical side and the Swedish side on biology. The groups held 5 joint meetings and one scientist from Uppsala visited Japan to learn technologies. The groups report one joint publication.

Entrepreneurial Achievements

No entrepreneurial achievements were to be expected but the mathematical model developed may be of more general significance.

Cooperative Achievements

A mathematical model of a general algorithm for network optimization has been built. This model can be used in application in novel computer programmeming and optimization. The MDB grant helped to stimulate the contacts between the labs with meetings and junior scientist visits.

Continuity

My research contact network in Japan has greatly expanded due to the project. For example, I am on the Swarm 2015 organizing committee (http://www.ohk.hiroshima-u.ac.jp/SWARM2015/). I was also invited to speak at RIKEN in January 2015, but unfortunately I couldn't go due to other commitments. It is planned that Nakagaki will visit here again during 2015. There is a good chance we apply for further joint funding, but have not started this process yet.

MDB10-0018 Laurell

Research Project

To study a biofluidic microchip that hypehenates two microfluidic technologies for improving cancer diagnostics. Laurell has had a previous MDB project using the same acoustophoretic technology for microbial cell concentration, but a connection between these two projects is not reported.

Scientific Synergy

No joint papers are reported. Two joint conference abstracts are reported. The Laurell lab has been successful with the microfluidic technology and they report significant benefits from the collaboration.

Entrepreneurial Achievements

The patent application is with only Swedish inventors. They are aiming to commercialize the results through their company AcouSort AB. Their results may lead to improved and faster cancer diagnostics. Depending of the outcome of the ongoing testing of the hyphenated technology platform in Tokyo, AcouSort AB may consider developing a prototype instrument for third party evaluation. This indicates an important role for the Japan partner also in entrepreneurial issues. AcouSort was founded independently from this MDB project, but AcouSort is the beneficiary on a potential application.

Cooperative Achievements

The project has involved two groups, the Laurell group studying the cell focusing method in Lund and Dr Fuji's cell trapping methods. Several graduate students and postdocs have travelled between sites to transfer technology. The groups have met several times/year in the course of the programme, both in Lund and in Tokyo as well as during international conferences. The project has had input of know-how from related projects in both Laurell Lab and Fuji Lab.

Continuity

The collaboration continued though on a slower speed. The project has established a very good relationship with Teruo Fiju Lab in Tokyo. We had a joint meeting on the project progress on Nov. 28, 2014 discussing how we can move the project forward. We are currently looking for

new funding opportunities. After closing the programme we have manufactured a new generation rare acoustophoresis cell separation chips that include separation and concentration. These chips are fully compatible with the dielectrophoresis cell trapping array that has been developed in the Teruo Fuji Lab. Dr. So Hyeon Kim from Teruo Fuji Lab was in Lund to get training and perform experiments on the new integrated system with rare cell separation, enrichment and diectrophoresis cell trapping. The new chip generation comprises several versions that currently will be evaluated in Lund and in Tokyo. A publication is being prepared on the development of the joint integrated acoustophoresis and dielectrophoresis system. The paper has been compiled after closing the MDB programme.

MDB 10-0025 Morgenstern

Research Project

The goal of the study is to be able to detect a single enzyme molecule for the treatment of tumors.

Scientific Synergy

The project brought together different universities/disciplines/departments of biochemistry, applied physics and organic chemistry. Two Swedish partners (KI and KTH) worked on biochemistry and biophysics, respectively while the Japanese partner contributed with organic chemistry.

There are three joint publications reported.

Entrepreneurial Achievements

There is an entrepreneurial aspect in the project, both for single molecule detection of enzymes, and potentially also as a pro-drug scheme for cancer therapy. However, no patent applications have been filed, and the project leader states that “in ten years’ time” they will know whether the results and the new molecules synthesized will turn out to be useful.

Cooperative Achievements

Innovative organic chemistry advances and the development of fluorogenic substrates for glutathione transferases have been main achievements. The Swedish group has modified cytostatic drugs and the Japanese partner has been able to convert them into releasable prodrugs. The cooperation has been successful and there have been several visits in both directions.

Continuity

The groups have continued to exchange materials (fluorogenic substrates and cytostatic pro-drugs). They have a manuscript in progress on the cystostatic prodrugs that will be submitted this year. The groups are in the completion phase of a paper on Zebrafish development where the fluorogenic substrates and a cytostatic prodrug are used as important tools. The joint Ph. D. that was funded partly by the grant is continuing the project together with a newly recruited post-doc (Marcus Cebula) at KI.

MDB10-0030 Oliveberg

Research Project

The Oliveberg group works on understanding protein structure inside the living cell. The goal of this study is to determine how the intracellular crowdedness and charge system affects the protein structure and protein aggregation. They identified a leading laboratory in Kyoto in the specific field of in-cell NMR by which isotope labeled proteins structural behavior can be followed.

Scientific Synergy

This project led to two joint papers. The Oliveberg lab publishes actively in high level journals.

Entrepreneurial Achievements

None

Cooperative Achievements

The technology worked out very well and now a devoted in-cell laboratory is being built in Stockholm.

Continuity

The lab has opened a number of international collaborations, but continuity in Japan is dependent on future funding.

MDB10-0034 Lindahl

Research Project

To develop an improved platform for cardiotoxicity assessment using human pluripotent stem cell lines.

Scientific Synergy

The Swedish group performs the biological research and the Japanese side contributes with the technology, i.e. a lab-on a-chip solution to measure toxic effects to cardiomyocytes cells developed from stem cells. A joint manuscript has been prepared and submitted for publication.

Entrepreneurial Achievements

All the work in this project has involved close collaboration with Cellectis AB (Göteborg, Sweden).

Cooperative Achievements

A laser etching system developed by the Japanese partner has been transferred to Göteborg, Sweden. It was reported that there have been a lot of interactions between the Swedish and Japanese researchers including several site visits during the year.

Continuity

No continuation.

MDB10-0047 Uhlen

Research Project

The goal of the project was to develop new methodology for the simultaneous detection of water and ion dynamics in single cells using bio-imaging.

Scientific Synergy

There have been 3 publications with joint authorship.

Entrepreneurial Achievements

The project is fundamental in nature and no entrepreneurial achievements are to be expected.

Cooperative Achievements

The major achievement of this project for the Karolinska Institutet and our research group has been the increased interaction with Japan. New collaborations with research groups in Japan have been established and several postdocs have decided to come to the Karolinska Institutet because of this project. Today I have one Japanese postdoc, Dr. Shigeaki Kanatani from Keio University, in my lab as a result of this project. Another postdoc, Dr. Nobuyuki Tanaka, from Japan will join my group in April 2015.

Continuity

At the time of reporting this project was ongoing. The basic synergy relates to technology to measure active water and ion transport in living cells. Active interaction (4 lab visits) is reported and two Japan post-docs are working at KI. The group report at least two joint publications.

Appendix 7. Quantitative Assessment (Anonymous)

	Scientific Synergy joint articles	Entrepreneurial joint patents	Cooperative Bilateral Visits, conferences, employ.	Continuity
2005 *	0	0	yes	yes
2005	0	0	yes	no response
2005	3	0	not stated	3 publications, continued Database
2005 *	0	0	yes + employed by RIKEN	yes
2005	1	0	not stated	no response
2006	0	1 not joint	not stated	no response
2006	0	1 not joint	yes	3 publications*
2006	3	0	yes	5 publications + joint grant
2006	1	0	yes	bi-lat visits, 4 public. S-student to Jap.
2006	1	1 joint priority in Japan	yes	1 Publication
2007	2	0	yes	FP7 funding
2007	2	0	yes	2 visits from Japan
2007 *	1	0	yes + conferences	yes but not specified how
2007	0	2 not joint 1 S 1 J	yes	yes
2007	0	0	joint conference organizors	bi-lat. Visits + 1 publication
MDB09 *	4	0	yes	no continuation
MDB09 *	2	0	3 bilateral visits + joint conference	J visit S, small grant + manuscript
MDB09	5	0	3 bilateral visits + joint conference + Swede received post-doc in Japan	2 joint publications
MDB09 *	2	0	yes	bi-lat visits, 4 public. S-student to Jap.
MDB09	1	0	yes	1 publication + collaboration w. Horton
MDB09 *	0	1 not joint	not stated	exchange of materials
MDB10 *	1	0	yes	yes
MDB10	0	1 not joint	yes	yes + manuscript
MDB 10 *	3	0	yes	exchange of material + manuscript
MDB10	2	0	not stated	informal contacts
MDB10	0	0	yes	no continuation
MDB10 *	3	0	yes	2 J-post-docs in S, 2 publications,4 bi-lat visits,
27 Total	**37 joint**	1 joint	19 yes	21 continued
* pre-exisiting	10 with 0	5 not joint (only Swed).	3 conferences	3 no response
collaboration	7 with 1		5 not stated	2 did not continue
	4 with 2			6 groups report publications after funding ended
	4 with 3			yielding **20 publications** and 3 manuscripts
	1 with 4			* unclear if Japanese authors are
	1 with 5			from original constellation

Appendix 8. Summary of telephone interviews (Anonymous)

In order to obtain a deeper understanding of the programme outcome, beyond that found in the written report, we decided to interview selected group leaders by telephone. We divided the groups into three different levels (high productivity, moderate productivity and low productivity) and invited two to three individuals from each level for a telephone interview. Those individuals who responded to the invitation were from the high and moderate productivity groups. None from the low productivity group responded even when a second email was sent out to them. As a result we were unable to obtain a deeper understanding of the programme outcome from the lower productivity group. As summary of the responses are found below. It can be concluded that these individuals found the MDB programme to be extremely useful both scientifically and culturally.

1 Overall, the collaboration with the Japanese partners was successful through the exchange of materials and peptides. However, it was noted that the interaction with the Swedish group was weak and difficult to motivate them. Part of the economic support went to a Spanish post-doc since a suitable Swedish candidate could not be identified. It was difficult to obtain a bi-lateral patent since the Swedish colleagues were not interested or motivated to pursue the patent. We still have collaborations with Japanese scientists but within a slightly different project. The support from SSF and VINNOVA for this project and it´s continuation was essential for the initiation of the collaboration. If such a programme were to be continued then we would select his Swedish collaborators with more caution.

2 The collaboration with the Japanese group enabled the Swedish group to build a database that built upon their molecular findings. The Swedish group would not have been able to generate this database without the help from Japan and overall, the collaboration was successful. One weak point with the collaboration dealt with the long distance between Sweden and Japan, but otherwise there were no other difficulties with the collaboration. A company was developed as a spin-off effect from the MDB programme. Collaborations with the original Japanese group are less active now partly due to fact that the goals proposed in the MDB project are now established.

3 An important and very much appreciated point was that the MDB programme supported existing collaborations. The economic support was very important for maintaining a collaboration that was successful and running smoothly. The collaboration was initiated because the Japanese group had a technique that was important for our research and unavailable in Sweden. It was pointed out that it seemed unnecessary for having two applications since the Japanese translated the Swedish applications (written in English) to Japanese. It was suggested that this be avoided. It was also pointed out that there were cultural differences but these were both important and rewarding to experience. Moreover, being a female scientist added another degree of complexity to the cultural experience especially with Japanese scientists not directly related to the project but within the same university.

4 The outcome of the collaboration was disappointing. There was little bi-lateral interaction and the underlying cause for this was difficult to understand. Cultural differences were apparent in the way in which the Japanese group did there research as well as in their thinking processes. The collaboration never took off partly due to these factors. Despite this obstacles, I am now associated with the RIKEN, an initiative from our main Japanese collaborator.

VINNOVA´s publications

November 2015

See vinnova.se for more information

Vinnova Analysis
VA 2015:

01 Årsbok 2014 - *Svenskt deltagande i europeiska program för forskning & innovation*

02 Samverkansuppgiften i ett historiskt och institutionellt perspektiv

03 Långsiktig utveckling av svenska lärosätens samverkan med det omgivande samhället - *Effekter av forsknings- och innovationsfinansiärers insatser*

04 Företag i Tåg- och järnvägsbranschen i Sverige - *2007-2013*

05 FoU-program för Små och Medelstora Företag - *Metodologiskt ramverk för effektanalyser*

06 Small and beautiful - *The ICT success of Finland & Sweden*

07 National Research and Innovation Councils as an Instrument of Innovation Governance - *Characteristics and challenges*

VA 2014:

01 Resultat från 18 VINN Excellence Center redovisade 2012 - *Sammanställning av enkätresultaten. (For English version see VA 2014:02)*

02 Results from 18 VINN Excellence Centres reported in 2012 - *Compilation of the survey results. (For Swedish version see VA 2014:01)*

03 Global trends with local effects - *The Swedish Life Science Industry 1998-2012*

04 Årsbok 2013 - *Svenskt deltagande i europeiska program för forskning och innovation.*

05 Innovations and new technology - *what is the role of research? Implications for public policy. (For Swedish version see VA 2013:13)*

06 Hälsoekonomisk effektanalys - *av forskning inom programmet Innovationer för framtidens hälsa.*

07 Sino-Swedish Eco-Innovation Collaboration - *Towards a new pathway for shared green growth opportunity.*

08 Företag inom svensk massa- och pappersindustri - *2007-2012*

09 Universitets och högskolors samverkansmönster och dess effekter

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01 Chemical Industry Companies in Sweden

02 Metallindustrin i Sverige 2007 - 2011

03 Eco-innovative Measures in large Swedish Companies - *An inventory based on company reports*

04 Gamla möjligheter - *Tillväxten på den globala marknaden för hälso- och sjukvård till äldre*

05 Rörliga och kopplade - *Mobila produktionssystem integreras*

06 Företag inom miljötekniksektorn 2007-2011

07 Företag inom informations- och kommunikationsteknik i Sverige 2007 - 2011

08 Snabbare Cash - *Effektiv kontanthantering är en tillväxtmarknad*

09 Den svenska maritima näringen - *2007 - 2011*

10 Long Term Industrial Impacts of the Swedish Competence Centres

11 Summary - Long Term Industrial Impacts of the Swedish Competence Centres. *Brief version of VA 2013:10*

12 Företag inom svensk gruv- och mineralindustri 2007-2011

13 Innovationer och ny teknik - *Vilken roll spelar forskningen. (For English version see VA 2014:05)*

14 Företag i energibranschen i Sverige - *2007-2011*

15 Sveriges deltagande i sjunde ramprogrammet för forskning och teknisk utveckling (FP7) - *Lägesrapport 2007-2012*

16 FP7 and Horizon 2020

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01 Insatser för innovationer inomHälsa

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04 Social innovation

05 Årsredovisning 2014

06 Sweden needs FFI *(for Swedish version see VI 2015:10)*

07 Innovation för ett attraktivare Sverige - *Underlag till regeringens politik för forskning, innovation och högre utbildning 2017-2020 - Huvudrapport*

08 Förutsättningar för innovationspolitik i Sverige - *Underlag till regeringens politik för forskning, innovation och högre utbildning 2017-2027 - Analysrapport*

09 Utmaningsdriven innovation - *Samhällsutmaningar som tillväxtmöjligheter*

10 Sverige behöver FFI *(for English version see VI 2015:06)*

VI 2014:

01 Tjänsteinnovationer 2007

02 Innovationer som gör skillnad - *en tidning om innovationer inom offentliga verksamheter*

03 Årsredovisning 2013

04 VINNVÄXT - *A programme renewing and mowing Sweden ahead*

05 *Replaced by VI 2015:01*

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07 VINNOVA - *Sveriges innovationsmyndighet. (For English version see VI 2014:10)*

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10 VINNOVA - Sweden´s Innovation Agency *(For Swedish version see VI 2014:07)*

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02 Destination Innovation- *Inspiration, fakta och tips från Ungas Innovationskraft*

03 Inspirationskatalog - Trygghetsbostäder för äldre

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10 Sammanfattning Fixartjänster i Sveriges kommuner - *Kartläggning. (Brief version of VINNOVA Information VI 2013:09)*

11 *Replaced by VI 2014:10*

12 *Replaced by VI 2013:19*

13 När företag och universitet forskar tillsammans - *Långsiktiga industriella effekter av svenska kompetenscentrum*

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15 Handledning - *för insatser riktade mot tjänsteverksamheter och tjänsteinnovation*

16 *Replaced by VI 2013:22*

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18 *Replaced by VI 2014:06*

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03 Googlemodellen - *Företagsledning för kontinuerlig innovation i en föränderlig värld*

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