REPRODUCTIVE BIOTECHNOLOGY

Opening Doors

Scientific workshops for young researchers

Almagro, Spain, 16-20 March 2003

Co-ordinators:

Eduardo Roldán, Museo Nacional de Ciencias Naturales (CSIC), Madrid

Harry Moore, University of Sheffield, Sheffield
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AIMS

The British Council in Spain, in collaboration with the Spanish Council for Scientific Research (CSIC) is organising a series of scientific workshops to provide opportunities for young researchers from both countries to meet face-to-face for the exchange of ideas, knowledge and information on priority topics and to explore future areas of research and collaboration.

This workshop on Reproductive Biotechnology was the first in the series, and provided ample opportunities for discussion in structured and informal sessions with keynote speakers and young participants. One important objective of the workshop was to identify areas for future research. Such areas are summarised in this report.

FORMAT AND PRESENTATIONS

Participants were grouped into 5 general themes but everyone was encouraged to contribute to all the discussions. A high level of interest and participation was characteristic of all sessions.

During each session, keynote speakers presented a general overview and specific findings from their group for about 30 minutes. Other members of the theme were allotted about 15 minutes to present their work. Everyone was encouraged to highlight the most important scientific questions and where the research is heading.

Themes and coordinators were as follows:

- Gamete function, infertility and environmental effects (Chair Harry Moore)
- Oocyte maturation and cryopreservation (Chair Juan J. Tarín)
- Genetic diagnosis and selection of reproductive traits (Chair Eduardo Roldan)
- Fertilisation, egg activation, and cell signalling (Chair John Carroll)
- Molecular interactions at fertilisation (Chair Manuel Avilés)

The meeting was held in English and very little translation (just informally, if necessary) was required.

General overview of meeting

The objective of the meeting was to generate as much informal discussion as possible across a wide range of topics in Reproductive Biotechnology and to identify areas of collaboration between research groups in Spain and U.K. Several factors contributed to the meeting:

1. The workshop was small with just 29 scientists (approximate equal numbers from both countries). Although the initial call for the meeting was open, the co-organisers selected participants taking into account their subject area / age / experience. As the meeting was all in English, it was important that most Spanish participants had a good command of English.

2. Scientists could face each other in a U-shaped seating arrangement, which was intimate and informal. Within a day most scientists knew each other and were on first name terms.

3. Formal PowerPoint presentations were kept short with only the key points of research highlighted.

4. Participants ranged in age and experience from Ph.D. students to heads of departments. There was little domination of discussion by particular people. Younger participants felt they could make a valuable contribution.

5. The venue was very good and provided a relaxed atmosphere. The evening get-together on the Sunday before the meeting was helpful in starting the meeting.

6. There were no abstracts or published material from the presentations.

7. There was a lot of informal discussion outside the sessions for one-to-one exchange.

These factors contributed to a generally successful meeting and the feedback from participants was very positive in that they enjoyed the format (although some had initial reservations) and that they would seriously consider making a collaboration with a group abroad.

Potential improvements/variations for future meetings include:

1. The meeting was quite intense and all the participants attended all the sessions. For the Spanish, listening and speaking in English was particularly tiring. A slightly shorter 2-day meeting covering less topics might be more effective.

2. A longer, more structured session at the end of the meeting on potential funding opportunities might have been useful. A short written document with a summary of funding opportunities for potential collaborations could be prepared and distributed to participants.
Follow up

Participants were followed up with their views of the meeting. A questionnaire was sent to all and the proportion of participants responding was very high. A summary of their views is presented at the end of this report.

Participants were requested to send information about whether any collaborative projects had been initiated on an informal/formal basis.

ACKNOWLEDGEMENTS

Many thanks to Lloyd Anderson (Director of Science, British Council), Christine Melia (Acting Director, British Council Spain) and Wendy Stokes (Science and Society, British Council Spain) for the opportunity to organise this workshop and for all their support and encouragement. Special thanks to Belén Fortea (Science and Society, British Council Spain) for her wonderful work coordinating the logistics before, during and after the workshop. Everything ran smoothly thanks to her.
LIST OF PARTICIPANTS

Juan G. Alvarez. Centro de Infertilidad Masculina Androgen, La Coruña. jalvarez@androgen.es
Manuel Avilés. Departamento de Biología Celular, Universidad de Murcia. maviles@um.es
Lluís Bassas. Departamento de Andrología, Fundación Puigvert, Barcelona. lbassas@fundacio-puigvert.es
Ian Brewis. The Division of Medical Sciences, School of Medicine, University of Birmingham. i.a.brewis@bham.ac.uk
Rosa Carballada. Museo Nacional de Ciencias Naturales (CSIC), Madrid. mcnr596@mncn.csic.es
John Carroll. Department of Physiology, University College London. j.carroll@ucl.ac.uk
Jesús del Mazo. Centro de Investigaciones Biológicas (CSIC), Madrid. jdelmazo@cib.csic.es
Josep Egozcue. Departamento de Biología Celular, Fisiología e Inmunología, Universidad Autónoma de Barcelona. Josep.Egozcue@uab.es
María José Escribá. Instituto Valenciano de Infertilidad, Valencia. mjescriba@ivi.es
Alireza Fazeli. University of Sheffield. a.fazeli@sheffield.ac.uk
Emilio Gómez. Laboratorio de Reproducción, Instituto Valenciano de Infertilidad, Murcia. emilogomez@ivi.es
Ana-Lila Garda. Unidad de Genética y Biología Molecular, Instituto Valenciano de Infertilidad, Murcia. analila@ivi.es
Alfonso Gutiérrez Adán. Departamento de Reproducción Animal, Instituto Nacional de Investigación Agraria y Alimentaria, Madrid. agutierrez@inia.es
Sheena Lewis. Department of Obstetrics and Gynaecology, Queens University, Belfast. s.e.lewis@qub.ac.uk
Pedro L. Lorenzo. Departamento de Fisiología Animal, Facultad de Veterinaria, Universidad Complutense, Madrid. pelorenz@ucmail.ucm.es
Carmel McVicar. Department of Obstetrics and Gynaecology, Queens University, Belfast. c.mcvicar@Queens-Belfast.AC.UK
Harry Moore. University of Sheffield. h.d.moore@sheffield.ac.uk
María Teresa Paramio. Departamento de Producción Animal, Facultad de Veterinaria, Universidad Autónoma de Barcelona. teresa.paramio@uab.es
John Parrington. Department of Pharmacology, University of Oxford. john.parrington@pharmacology.oxford.ac.uk
Helen Picton. Department of Obstetrics and Gynaecology, University of Leeds. h.m.picton@leeds.ac.uk
Nilendran Prathalingam. Royal Veterinary College, London. nprathalingam@rvc.ac.uk
Juan Enrique Rodríguez-Gil. Unidad de Reproducción Animal, Facultad de Veterinaria, Universidad Autónoma de Barcelona. JuanEnrique.Rodriguez@uab.es
Eduardo Roldan. Museo Nacional de Ciencias Naturales (CSIC), Madrid. roldane@mncn.csic.es
Salvador Ruiz-López. Departamento de Fisiología, Facultad de Veterinaria, Universidad de Murcia. sruiz@um.es
Juan J. Tarín. Departamento de Biología Funcional y Antropología Física, Facultad de Ciencias Biológicas, Universidad de Valencia. Juan.J.Tarin@uv.es
James Thorne. Institute of Reproductive and Developmental Biology, Imperial College London, Hammersmith Hospital, London. james.thorne@imperial.ac.uk
Lisa Thurston. Reproductive Biology Unit, Royal Veterinary College, London lthurston@rvc.ac.uk
Katrien Van Look. Institute of Zoology, Zoological Society of London. Katrien.VanLook@ioz.ac.uk
Chi Wong. Department of Reproductive and Developmental Medicine, University of Sheffield. c.h.wong@shef.ac.uk
MAIN CONCLUSIONS AND AREAS OF FUTURE RESEARCH

Game te function, infertility and environmental effects

Chair: Harry Moore; keynote speakers in colour

Lluis Bassas: occupational hazards and infertility.
Sheena Lewis: sperm chromatin integrity; sperm function.
Katrien J.W. Van Look: fish gamete quality; endocrine disruptors on sperm and egg function fertilisation and hatching success.
Jesús del Mazo: screening of gene markers to detect effects of endocrine disruption during mammalian testis development; expression libraries of spermatogenic cells.
Juan Enrique Rodriguez-Gil: sperm function; sperm metabolism.
Carmel McVicar: apoptosis in the testis and ejaculated sperm.
Rosa Carballada: apoptosis in testis/epididymis and environmental effects/seasonality.

Overall, it was felt that there is a need to better characterize tests of sperm capacity, defining what sperm function and attributes need to be measured. With regards to tests measuring sperm DNA damage, it was felt important to identify what exactly the different tests measure, and how they compare to other tests of sperm function.

It will be important to collect and study larger data sets, paying attention to possible geographical differences in populations (e.g., UK vs Spain, rural vs. urban, special environments such as greenhouses), in order to find relationships between environmental and occupational exposure to toxicants and fertility. In this context, it was felt important to decide which screening and functional tests to use.

Environmental factors

There is currently considerable interest in the effect of environmental factors on male fertility. It is, however, difficult to draw general conclusions from studies analysing these effects due to various confounding factors. It was felt important to make an effort to define categories of factors, recognizing that some are still ill-defined (e.g. what is organically-grown food?). The need to carry out studies with a large number of subjects was emphasised. Most studies of environmental factors deal with human subjects and a lot more emphasis is needed to understand their effects on domestic and wild species.

DNA damage in spermatozoa

Several presentations dealt with DNA damage in spermatozoa. Considerable effort should be placed on defining the various tests for measuring DNA damage with respect to comparability and reliability. Furthermore, it is important to understand what these tests are really measuring. There are differences in DNA packaging between immature and mature sperm so this should be taken into account when analysing human semen samples where a high proportion of immature sperm cells can be found. It will be important to clarify if the proportion of damaged sperm is relatively constant within an individual over time. Some studies have identified such constancy but others have identified variation, especially during recovery after episodes of high fever. The effect of age should also be explored; although it was earlier considered unimportant, current evidence suggests that it may affect levels of sperm DNA damage.

Species may differ in the threshold levels of sperm DNA damage above which fertility may be compromised and this needs to be characterized thoroughly. There is considerable interest in understanding genetic factors affecting sperm DNA damage; species or populations with varying levels of inbreeding (laboratory or endangered species) may help address this issue. Other genetic factors should be explored and efforts made to understand DNA damage at the molecular level. Questions need addressing such as: Where is damage taking place?, Is damage the result of a direct action, or lack of repair ability?, Are there specific loci of action for various toxicants? There is also the important issue related to the so-called “iceberg effect”. Are we only detecting a small proportion of the total DNA damage in a sperm population? More, but minor (and yet undetected) damage may exist. This may explain why human sperm samples with >30% sperm DNA damage have very poor fertility.

Finally, it would be important to address if cheaper, less labour-intensive tests could be developed, validated, and used.

Reprotoxicant testing

There has been considerable progress in developing in vitro assays to be used for reprotoxicant testing. Genes expressed during spermatogenesis and during testicular differentiation, that can be the targets of reprotoxictants, have been identified and much will be gained from future studies in this area.

Sperm function (metabolism)

Results of recent studies on sperm metabolism were presented and discussed in relation to its importance for sperm survival and capacitation. Since metabolism varies depending on whether spermatozoa have short
or long lifespans (i.e. in species with short or long oestrus), this could help define mechanisms regulating capacitation. Quantification of sperm metabolism may be a useful tool in fertility testing, and when analysing environmental effects (e.g. phytoestrogens and protein phosphorylation?).

**Seasonality**

Current studies on wild seasonal rodents are helping to understand at the molecular level how spermatogenesis and regulation of male reproductive tract function is turned on and off. These studies have implications for male infertility and male contraception.

**Oocyte maturation and cryopreservation**

Chair Juan J. Tarín; keynote speakers in colour

Juan J. Tarín: factors affecting maturation and post-fertilisation development of mammalian oocytes.

Helen Picton: oocyte maturation and cryopreservation.

Josep Egozcue: chromosome abnormalities in oocytes and effects of cryopreservation.

Pedro L. Lorenzo: oocyte maturation, growth factors, intracellular signalling.

James Thorne: factors initiating follicle growth, oocyte maturation.

Emilio Gómez: oocyte maturation in vitro.

Maria Teresa Paramio: in vitro maturation of domestic animal oocytes.

**Stage of oestrus cycle and quantity and quality of oocytes**

The day of the oestrus cycle when follicle growth is stimulated with exogenous hormones affects quality of oocytes and early development. The possibility that this may be an important factor in the developmental potential of superovulated and in vitro manipulated oocytes (e.g. ICSI, nuclear transfer) should be explored further.

**Oocyte ageing**

Ageing of the female gamete may have long term effects, even on the post-natal development of offspring. But ageing of the oocyte itself runs parallel to modifications in the female tract as the hormonal environment of the oestrogenic phase changes into that of the luteal phase. Thus, it would be important to dissect these two effects on oocyte function and developmental potential. In addition, efforts should be made to unravel the molecular and cellular mechanisms underlying the long-term effects of oocyte ageing.

**Oocyte maturation and cryopreservation**

Efficiency of oocyte freezing varies according to their developmental stage, with GV oocytes freezing better than MII oocytes. This calls for the development of reliable in vitro maturation systems and, with it, a better understanding of the metabolism of the growing oocyte and follicle and of gene expression and imprinting. The goal to pursue is the development of single cell molecular analysis. It will be important to pay attention to the source of tissue to study since reproductive age and species differences are likely to be important factors influencing results.

In the study of oocyte maturation, attention should be paid to the effect of growth factors on follicle and oocyte growth and it will be important to bear in mind that there is likely to be bidirectional communication between oocyte and follicle cells and to explore this in further detail.

There is still much work to be done to improve in vitro maturation conditions of oocytes/follicles from domestic species. Better oocyte selection methods are needed and culture conditions should be improved. It will be very important to identify markers of oocyte maturation. Studies on domestic animals have identified that roscovitine is a helpful agent enhancing oocyte maturation. It was felt that more studies are needed to characterise its mode of action and that caution should be used when extrapolating results to other species such as humans. Important differences in in vitro maturation protocols exist between species, especially with regards to the initiation of the in vitro culture and the timing of hormone surges. Thus, in domestic species, in vitro maturation involves culture of immature stages collected before the LH surge whereas, in humans, oocytes are collected from stimulated ovaries and then matured in vitro.

Studies on oocyte maturation will also help to understand pathologies, such as the polycystic ovarian syndrome (PCO) seen in human patients, or the development of cystic ovaries in cattle.

Overall, there was a general agreement on the need to understand cellular and molecular mechanisms underlying oocyte development and growth.

**Chromosome abnormalities in oocytes; effects of cryopreservation**

Most chromosomal non-disjunctions take place during MI (i.e. during foetal development in females). Is this due to failure of meiosis checkpoints? Oocytes show more aneuploidies than sperm cells (12% vs 6%, respectively) which raises the question of whether female control of meiosis is less efficient. The analysis of polar body chromosomes is one important tool in preimplantation genetic diagnosis (PGD). A note of warning was issued because concurrent analysis of both the oocyte and its polar body revealed that euploid oocytes could bear an aneuploid polar body, with the opposite being also true.
Reliable human oocyte freezing protocols are currently available and clinical use is now starting, with pregnancy rates almost as high as those seen when using fresh oocytes. Recent studies found a high rate of chromosomal abnormalities after freezing, but more work is needed since some results may be overestimates.

**Genetic diagnosis and selection of reproductive traits**

**Chair Eduardo Roldan; keynote speakers in colour**

Lisa Thurston: sperm cryopreservation and genetic variation.

Nilendran Prathalingam: use of fluorescent methodologies to assess sperm traits.

Salvador Ruíz-López: pig reproductive biotechnology.


**Sperm freezability and genetic markers**

Differences in the ability of spermatozoa to withstand freezing and thawing (cryosurvival) have been found between breeds/strains and individuals. Since there are also considerable breed/strain and inter-individual variations in sperm head morphology, it is thought that there may be a relation with cryosurvival. Biophysical mechanisms could underlie differences in cryosurvival (Sperm head shape? Sperm head volume? Water flow across membranes?). Genetic analysis using AFLPs revealed marker differences between individuals with good or bad freezability.

Future studies should (a) map position of markers on chromosomes, (b) identify "freezability" genes, (c) develop protocols to minimize impact of cryopreservation, (d) use or develop functional tests to complement/further understand cryosurvival and its genetic basis, (e) explore relations with other production traits to avoid selection against such traits.

**Fluorescent methodologies to assess sperm traits**

New technologies based on fluorescent detection and/or quantification of cell integrity, cell metabolism, or attributes (presence of X or Y-bearing sperm) are now being developed. Many of these techniques require expensive equipment and are time-consuming. For routine use, there is a need for fast techniques which would be reliable and relatively cheap.

**Animal reproduction programmes**

There is an enormous potential in the genetic modification of animals and their use in human health-related issues, such as xenotransplantation of organs from genetically-modified pigs. In addition, animal production programmes can still benefit from genetic improvement. One important tool in animal breeding will be the wide-spread use of sex preselection by sorting X- and Y-bearing spermatozoa. Methods for more reliable and faster X-, Y-sperm sorting will be required.

**Embryo production in vitro**

Much effort is now being placed on the identification of genes that control embryo development and sexual differentiation. One important issue relates to the identification of the mechanism underlying the differential timing of first cleavage of male and female embryos. In addition, it should be explored whether there is a differential expression of autosomal genes in male and female embryos.

**Molecular basis of male infertility**

There is now considerable interest in understanding the molecular basis of male infertility. Studies are under way screening infertile men for cystic fibrosis gene mutations and Y chromosome microdeletions. Furthermore, emphasis is placed on gene expression patterns in normal and round-headed spermatozoa to find the genes responsible for developmental abnormalities.

**Fertilisation, egg activation, and cell signalling**

**Chair John Carroll; keynote speakers in colour**

John Carroll: signalling during oocyte activation.

John Parrington: sperm factor-egg activation.

Alireza Fazeli: oviductal interactions with gametes and pathogens.

Maria José Escerbá: microfertilisation techniques.

**Sperm-oviduct epithelial interactions**

It is well known that oviductal cells influence sperm function. But, there is now interest in understanding whether sperm cells are in any way signalling to the oviductal epithelium and, if so, which are the underlying mechanisms. One area of future research relates to possible sperm-induced modifications of gene and protein expression of the epithelium. Results from this work could help improve gamete/embryo preservation methods. This area of study will benefit enormously by using different animal models (rodents, pigs, humans) due to considerable species differences in their reproductive physiology.
Egg activation

What are the precise signalling pathways activated during egg activation? Are signalling mechanisms similar in all species? These are important questions to be addressed in future years. In addition, it will be important to clarify whether signalling mechanisms activated in the egg with the use of assisted reproductive techniques, or nuclear transfer, are similar to those activated by sperm entry under natural conditions. This will be important to understand embryo losses and improve results of in vitro embryo production.

Egg activation is thought to be initiated by a sperm-borne factor which may be similar across species (mammals/vertebrates). Obvious differences in fertilisation mechanisms exist across vertebrate species so it would be important to address how conserved the sperm-borne factor is and whether signalling pathways activated are also conserved.

Since there appears to be a tightly controlled sequence of events underlying egg activation, and that this seems to be crucial for embryo development, it would be important to address whether we can use our understanding of these processes to predict developmental capacity of zygotes and embryos. Can we translate this knowledge to clinical procedures to enhance success of assisted fertilisation or for diagnosis of lack of success? It may eventually be possible to design tests to evaluate the effects of potential toxicants on egg activation and development and the molecular targets of such effects.

Micromanipulation techniques allow for the removal of extra (male) pronuclei and the possibility of restoring viability to polyspermic zygotes fertilized in vitro. It also allows for a variety of additional microfertilization techniques that, however, should be evaluated carefully before their clinical use becomes widespread.

Carbohydrate interactions at fertilisation

While protein interactions at fertilisation have been extensively investigated, there is less known about sugar-sugar and sugar-protein interactions between the sperm and egg even though it is clear that sugar ligands play a major role in gamete binding interactions. There is a need to identify the sugar residues on the zona pellucida and egg membrane involved in sperm binding. Comparisons between species will be important in this respect. It is possible that sugar epitopes may be suitable targets for new methods of contraception.

Contraceptive vaccines

There is a need to harness our understanding of reproduction for new methods related to fertility, breeding and control of fertility. For this we need to adopt cross-disciplinary approaches to develop new methods of fertility control such as contraceptive vaccines. While this approach shows promise, new antigens need to be characterised as targets for vaccines. Studies already exist in the UK to develop immunocontraception tools to control invading animal species. In Spain, this area of research and its implementation has an enormous potential due to the need to control invading species affecting survival of native wildlife and also to help control animal populations in national parks. A collaborative approach to these problems is necessary and there is much opportunity to join in large programmes.

Molecular interactions at fertilisation

Chair Manuel Avilés; keynote speakers in colour

Ian Brewis: molecular mechanisms of fertilisation; sperm proteomics.
Manuel Avilés: zona pellucida carbohydrates.
Chi Wong: contraceptive vaccines.

Proteomics to investigate sperm function and fertilisation

New techniques of proteomics offer a means to fully characterise the protein profile of spermatozoa. However care must be taken to prepare the sperm sam-

OPPORTUNITIES FOR COLLABORATION

Many opportunities for collaboration were identified.

Financing future interactions?

There are several possibilities for funding either individual or joint research activities.

Spanish funding for R&D

Ministry of Science and Technology (http://www.mcyt.es)
There are annual calls for research grants in several areas:
Promotion of Knowledge, National Plans on various priority topics (Biotechnology, Natural Resources, Agricultural Sciences), and Special Initiatives (Acciones Estratégicas). It is now possible to include a scientist from a non-Spanish institution as a collaborator on a grant. See last call for proposals: Spanish Official Bulletin / Boletín Oficial del Estado (BOE) of 31 October 2002. The new National Plan for R&D 2004-2007 will be presented in the near future.

Ministry of Education, Culture and Sport (http://www.univ.mecd.es)
There is a National Programme for Mobility of (A) Spanish research scientists and university professors who wish to apply for research visits abroad and (B) foreign nationals to spend periods of research in Spain; the latter option has two categories: (B1) Sabbaticals for university professors and senior research scientists, and (B2) periods of research for young researchers. Stays from 3 months to 2 years are funded. These calls also include the possibility of going to two different labs. Last call: BOE 10 October 2002 with two deadlines for applications.

There is, in addition, a Programme of Postdoctoral Fellowships (for non-staff scientists) for periods of research of 12-24 months in Spain or abroad. For scientists with stays abroad, it is possible to apply for a stay in a Spanish lab (1 month per year). Last call (BOE 12 December 2002) with deadlines in December 2002 and April 2003. Applicants must be Spanish or EU citizens with Spanish residence.

Some regional governments also have postdoctoral fellowships. Some calls are open to EU citizens.

Private industry?
If this is your case, there are various options. There is a programme operated by the Centre for Technological and Industrial Development (CDTI), Ministry of Science and Technology. There is also the possibility of applying for Eureka funds (EU).

UK funding for R&D
Research Councils
Project grants through the BBSRC with inclusion of EU co-applicants.
The MRC have cooperative and development grants where money for EU collaboration can be applied for.

The Wellcome Trust
It is possible to include a collaborator from abroad on project grants and obtain money for travel and research costs.

The Royal Society
Applications need to be submitted by UK scientists
Can support travel and subsistence.
EVALUATION QUESTIONNAIRE

OPENING DOORS
Reproductive Biotechnology
Almagro, 16-20 March 2003

1) General Assessment
Attending this workshop was a positive experience.

- Strongly Agree: 24
- Agree: 1
- Disagree: 0
- Strongly Disagree: 0

The workshop has provided me with new and valuable information

- Strongly Agree: 19
- Agree: 6
- Disagree: 0
- Strongly Disagree: 0

I feel that the knowledge I have gained can be shared with colleagues

- Strongly Agree: 18
- Agree: 7
- Disagree: 0
- Strongly Disagree: 0
This workshop has met my objectives

2) Professional programme and working groups

All relevant topics were covered

It was a well balanced programme
There was enough discussion time

Presentations were good

The length of the event was just right

The pace of the programme was just right
The venues chosen for the working groups were appropriate

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3) Event Venue
The standard of accommodation was

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The food was

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The workshop facilities were

- Excellent: 18
- Good: 7
- Satisfactory: 0
- Poor: 0

4) British Council
As a result of your contact with the BC how has your impression of the UK changed?

- More Favourable: 8
- Unchanged: 5
- Less Favourable: 0

5) Altogether
Overall how would you rate this event organised by the British Council?

- Excellent: 25
- Good: 0
- Satisfactory: 0
- Poor: 0
ADDITIONAL COMMENTS

"Content was very good, organisation was excellent and presentation of the programme was good too". (Ian Brewis)

"From start to finish this event was well organised and all participants were enthusiastic from the outset. The balance of ages was ideal so that the younger members were not intimated and the older members did not spend the meeting speaking to each other. The programme was excellent". (John Carroll)

"The meeting was very well organised. It gave the participants ample time to discuss different issues and also become familiar with each others’ work". (Alireza Fazeli)

"It was a great event, well organised and a very enjoyable as well as useful experience. I particularly valued the chance to discuss others’ work in detail and to carry on the discussion informally. Better than a typical scientific meeting in that sense". (John Parrington)

"The idea to hold the workshop was rather last minute, but despite this the workshop itself was well organised and thought out. The programme content was varied and promoted a lot of discussion. The British Council representatives organised and looked after the delegates very well". (Helen Picton)

"It was an excellent programme and allowed a lot of interaction between everyone during the discussion time. All round a very well organised meeting". (Nilendran Prathanlingham)

"I feel it has been a very valuable learning experience for me. I have been put in touch with people I will always feel comfortable to ask advice from on many areas of the subject". (James Thorne)

"The programme was excellent. All participants who I spoke to agreed that the quality of both the presentations and the discussion sessions was extremely good. The small number of participants and welcoming atmosphere helped the younger people to take part in the discussion sessions without feeling intimidated. The social arrangements and workshop venue also helped us to mix with other participants in an atmosphere which promoted further discussion leading to collaboration. I only wish I had insisted the other members of my lab had attended such a successful and enjoyable workshop". (Lisa Thurston)

"I thought it was an extremely interesting, stimulating and well-organised workshop. I had some really useful and helpful discussions whilst I was there with some of the participants. I cannot fault the workshop in any way". (Katrien Van Look)

"The workshop was well organised from communications, travel, accommodation, to the social events. The event looked professionally organised. The topics in the programme were well balanced covering a series of topics in reproductive biology and medicine. The number of participants in the workshop was about right for interaction, so that everyone got to know each other". (Chi Wong)

"If another meeting of this kind takes place, I would suggest to have at the beginning of each theme a state-of-the-art lecture to summarize knowledge of that theme." (Juan Álvarez)

"I am very satisfied with this workshop because it has allowed me to contact other scientists. I learned many things that I did not know, all of which have an immediate application in my research. I have already started two scientific collaborations with two scientists (one English, one Spanish) who attended the workshop." (Manuel Avilés)

"The contents of the scientific programme were very interesting, especially those in the field of reproduction. The format chosen allowed for ample dialogue and discussion of themes, rather than of specific research results. It was very innovative and allowed for the circulation and exchange of ideas." (Rosa Carballada)

"Both the idea of the workshop and the way it developed was very appropriate. Perhaps there could have been more participation of UK scientists. It would be desirable to have a series of meetings on the same subject at regular intervals with venues alternating between UK and Spain, sponsored by BC and CSIC (at least in part)." (Jesús del Mazo)

"The programme was, in general terms, excellent and balanced, but due to the area of interest of the participants there was an excess coverage of the oocyte. The fact that young people could only present an “outline” of their work left us without information on their area of research. There was no sound amplification and it was sometimes difficult to follow the debate between a speaker and people seating close to him/her." (Josep Egozcue)

"The programme was adequate, well organized and structured. The presentation of the different lines of research of participants has been extensive and intense and according to need." (Maria José Escribá)
“I liked all the presentations because they offered me a precise profile of cutting-edge reproductive biotechnology. The venue was excellent, not only because it was a beautiful place, but also because it allowed us to have good interaction during the whole length of the meeting. The organization was excellent and impeccable.”
(Ana-Lila Garda)

“The workshop organization has been very good and well managed. Presentations were in general adequate and of a high standard, were easy to follow in English. The organization was excellent.”
(Emilio Gómez)

“I only have positive comments. I would have liked to have information on participants and contents beforehand so I could have made contact with some participants before the meeting.”
(Alfonso Gutiérrez-Adán)

“The order and pace were adequate, but the areas covered by each scientist could have been outlined before the workshop. Impeccable organization. A very positive experience.”
(Pedro Lorenzo)

“The organization and presentations were impeccable. The contents were a bit confusing. My idea before the workshop was not along the line of presentations of results but, rather, that keynote speakers would present a review of basic and general aspects of their areas of expertise and that the other participants would present our scientific problems in order to discuss them. In any case, the workshop was a good idea and it has allowed us to meet face-to-face with a number of scientists for future collaboration.”
(María Teresa Paramio)

“My only comment relates to the excessive content of one of the sessions (Tuesday 18), when we had 12 presentations. In general terms, my final impression of this workshop couldn’t be more positive.”
(Salvador Ruiz)

“The content and the organization and presentation of the programme were excellent.”
(Juan J. Tarín)

### Results of Event Evaluation Questionnaires

<table>
<thead>
<tr>
<th>General data</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of participants</td>
<td>27</td>
</tr>
<tr>
<td>Number of questionnaires received</td>
<td>25</td>
</tr>
<tr>
<td>Percentage of replies received</td>
<td>92%</td>
</tr>
<tr>
<td>Spanish participants</td>
<td>15</td>
</tr>
<tr>
<td>British participants</td>
<td>12</td>
</tr>
<tr>
<td>Questionnaires received from Spain</td>
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