

## Newsletter No: 193 / Summer 2008



### Society for Reproduction and Fertility

**Newsletter compiled by John Parrington (SRF General Secretary).**

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### **Fertility 2009**

(6<sup>th</sup> Biannual Conference of the UK Fertility Societies)

Wednesday 6<sup>th</sup> January – Friday 9<sup>th</sup> January

Edinburgh International Conference Centre

PhD student and post-doc SRF members presenting work eligible for £350 support

14<sup>th</sup> September Deadline for abstract submission

31<sup>st</sup> October Deadline for Early Bird Registration

Further details on <http://www.srf-reproduction.org/>

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### **SRF Chairman's Thoughts**

Following the 2008 AGM in Edinburgh it is time to report on the work of the Council of Management and the many challenges that continue to face societies such as SRF.

The Finance Committee, under the direction of Martin Luck, has continued to manage the income and expenditure of the SRF to provide the solid financial foundation required to support the current and future academic and charitable activities of the Society. We have continued with our strategy to provide postgraduate and postdoctoral members with grant support to attend the annual conference and to present their work. Council is very encouraged to see a good uptake of these grants. This strategy is increasing the numbers of new membership applications and it enhanced the quality of the science presented at the annual conference in Edinburgh. To further encourage meeting participation Council approved three new awards. A prize for the best presentation by a postdoctoral researcher and a poster prize were awarded for the first time in Edinburgh. The Education and Development Sub-committee also introduced an essay prize in 2007/8 for undergraduate students. A high number of quality entries were received and the winning essay is published in this newsletter and on the SRF website.

The annual challenge facing the Council of Management is the need to continue to rebuild and support the membership of the Society and to ensure that SRF membership represents good value for money. Council have been proactive in their approach to the recruitment of new members in recent years and intend to target recruitment of more European members over the coming year. We have seen a steady increase in the number of new postgraduate and postdoctoral membership applications in the last two years following the introduction of the conference grant scheme. Following this success, we are now looking at how best to support the more senior members of the Society and to encourage their contribution to the running of SRF and to the scientific agenda and debate at our conferences. Members who are established scientists are eligible to apply for SRF travel grants as well as Vacation Scholarships which support research projects conducted by undergraduate students. A number of summer studentships are awarded annually, details of the process for this are on the website. Over the last 12 months Council has reviewed and streamlined the process for election of honorary members of the Society to ensure: (i) recognition of the considerable efforts of members of the SRF (and SSF) who have given freely of their time over a number of years to support the Society and its Journal; and (ii) to honour distinguished scientists who have made a significant contribution to education and research in the field of

Reproduction and Fertility. We are delighted to announce that this year honorary membership of the SRF has been awarded to: Prof. Brian Cook, Prof. Lynn Fraser, Sir Brian Heap, Prof. Ron Hunter, Prof. Stuart Milligan and Prof. Paul Watson.

In recent years with the pressure of work commitments it has proved difficult to persuade members of the SRF to stand for election onto Council and to contribute to the management and future of the Society. We were particularly encouraged this year that five members stood for election to fill the two vacancies available on Council. We would like to thank all those who participated in the election process and I am pleased to welcome Prof. Cheryl Ashworth and Dr Richard Lea as new Ordinary Members of Council. Further elections will be held at the AGM in July 2009 as more places become available on Council when existing members complete their terms of office.

The timing and format of the SRF annual conference and the contribution of SRF to the Joint UK Fertility meetings has been the subject of considerable debate by Council members and by the Meetings Subcommittee. Council has made a commitment to hosting the annual conference for its members in early July and we have unanimously agreed to continue to provide grants to help support conference attendance. To encourage attendance at the annual conference the scientific programme must be high calibre and the registration fees must be affordable. With this in mind Council ratified the modification of the format of the annual conference to that of a two-day meeting. The new format was successfully implemented for the first time this year in Edinburgh. The Joint UK Fertility Societies meetings from now on will be held in early January on alternate years. We hope that fixing the timings and improving the format and scientific content of both meetings will assist members in planning their conference attendance as it will standardise the abstract submission deadlines, reduce clashes with other international meetings and also help to minimise the registration fees and costs of running the meetings.

I hope this overview will provide some insight into the activities of Council and the work we have undertaken on behalf of the members of the Society over the last twelve months. I would like to end this report by thanking Henry Jabbour for his hard work for the Society over the last three years in his capacity as Programme Secretary and chair of the Meetings Subcommittee. I would also like to thank Michelle Myers for her contribution to Council during her term as the Postgradoc Rep.

**Helen Picton**

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## Members of SRF Council

<b>Chair:</b>	Helen Picton
<b>Treasurer and Company Secretary:</b>	Martin Luck
<b>General Secretary:</b>	John Parrington
<b>Programme Secretary:</b>	Robert Abayasekara
<b>Editor in Chief:</b>	Tom Fleming

**Committee Chairs:**

<b>Finance:</b>	Martin Luck
<b>Meetings:</b>	Robert Abayasekara
<b>Education &amp; Development:</b>	John Parrington

<b>Ordinary members:</b>	Rachel Webb
	Paul Fowler
	Colin Duncan
	Francesca Houghton
	Eduardo Roldan

<b>Post-grad/doc Reps:</b>	Andrew Childs
	Mhairi Laird

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## Travel Grants and Vacation Scholarships

All non-statutory members of the Society are eligible to apply for travel grants to attend conferences organised by the SRF or other bodies. For further information including an online application form, please visit the website (<http://srf-reproduction.org>) or contact the SRF Business Office.

Recently travel grants were awarded to APF Flint, Vicki Onions, Linda Sheldrick, Arif Siddiqui and Carlos Souza.

The Society also sponsors Vacation Scholarships which help to fund promising undergraduate students who wish to carry out research projects in their Easter or summer holidays. If you have a project, or know of a suitable student, please visit the website for further information about how to apply. Please note that students at all stages of their undergraduate degree are now eligible.

Over the summer vacation scholarships were taken up by Hazel Taylor, Yewson Cheng and Laura Farleigh

All travel grant recipients are required to write a short report about the meeting they attended and to acknowledge SRF support on any poster or oral presentations. These reports should be sent to the SRF General Secretary via the Business Office and may be published in the SRF newsletter.

The SRF would like to encourage Vacation Scholarship award recipients (student or supervisor) to present their results as a poster presentation at the next SRF meeting. Registration will be waived for students presenting their scholarship data at the SRF conference. In the event that the student/supervisor is unable to attend the SRF conference a full report will be required detailing the findings of their investigation. This report may be published in the SRF newsletter.

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## From the Programme Secretary

Thanks to those Society members that supported the last SRF annual meeting held in Edinburgh at Pollock Halls between June 29-July 2. We hope that those of you who attended the meeting enjoyed the new format of the conference and both the scientific content and the social programme.

The conference featured various symposia (Symposium 1: Signalling in Reproduction, Symposium 2: Evolution of Reproduction and Symposium 3: Gametogenesis and Differentiation), award plenary lectures and a newly introduced postdoctoral prize session that is aimed for postdoctoral scientists who are within four years of having obtained their PhD. The SRF distinguished scientist lecture entitled: "Formation of oocytes in mouse and human, *in vivo* and *in vitro*" was delivered by Professor Anne Grete Byskov from Denmark. Professor Alan McNeilly from the Medical Research Council Human Reproductive Sciences Unit was the recipient of the 2008 Marshall Medal and this was awarded at our conference dinner hosted at the South Hall at Pollock Halls.

Dr Greg FitzHarris from the Institute of Women's Health at University College London was the recipient of The SRF New Investigator Scientist Award for 2008. Greg delivered his award lecture entitled "Kinesin-5 drives microtubule polewards in the mouse egg spindle". The SSR New Investigator Scientist, Dr Derek McLean from Washington State University delivered a lecture entitled "Hormonal network regulating spermatogonial stem cell homeostasis".

We have had an excellent submission rate of abstracts to this conference. Our postdoctoral and student members made a strong presence in Edinburgh. We had a high number of abstracts submitted for consideration for the SRF postdoctoral and student prizes. Three abstracts were short-listed for the postdoctoral prize, which were presented in the SRF postdoctoral prize oral session. Congratulations to Dr Gemma Evans who was the recipient of the postdoctoral prize for 2008. We also had six abstracts that were short-listed for the student prize. The students presented their work in the SRF student prize oral session. Congratulations to Alison Wallace who was the recipient of the SRF student prize for 2008.

For full details of the abstracts of our 2008 conference please go to our webpage:

<http://www.srf-reproduction.org/meetings/conf2008/overview.htm>

This year we also introduced a "Poster Prize" which is open to all poster presentations. The recipients of the poster prizes at the Edinburgh SRF 2008 conference were: Dr Michelle Welsh (third place), Dr Judy McNeilly (second place) and Dr Lee Smith (first place).

My term as programme secretary of the Society has come to an end. It has been a pleasure and an honour serving the Society in this capacity. I would like to thank SRF council and the SRF programme committee (Robert Abayasekara, Andy Childs, Franchesca Houghton, Michelle Myers, Eduardo Roldan, Justin St John and Rachel Webb) for their help throughout the past three years in organising our annual conferences.

Organisation of our future SRF conferences is underway and is led by Dr Robert Abayasekara who has taken on the role of SRF programme secretary.

#### **Henry N Jabbour**

The role of programme secretary is a tough one, which Henry Jabbour has performed wonderfully well over the past three years. I therefore take over the reins with a

sense of trepidation but also some excitement. The commencement of my term of office coincides with some changes to the meetings cycle which are being introduced in response to feedback from the membership and are outlined below.

Over the past few years, the annual meeting of the society has either been a stand-alone SRF meeting in the summer or a joint meeting of the UK fertility societies in springtime. This has meant, on occasion, a gap of ~15 months between meetings. Both meeting formats have proved to be popular, however a significant proportion of the membership have raised concerns, principally regarding timing and costs. Council has grappled with this thorny issue for some considerable time and have adopted a meetings policy which will be of benefit to the vast majority of members. This new policy involves running a SRF meeting ANNUALLY in July. In addition, every TWO years SRF will actively participate in the joint fertility meeting in early January. In simple terms the merits of this system are that SRF members will be able to attend an ANNUAL high quality meeting which will be in the format of the recently concluded SRF 2008 in Edinburgh. The next annual SRF meeting, SRF 2009 will be held at St Catherine's College, Oxford 12-14 July 2009. This annual SRF meeting will be preceded by the bi-annual joint meeting, FERTILITY 2009 which will be held in Edinburgh 7-9 January 2009. Planning for FERTILITY 2009 is at an advanced stage with an exciting programme in prospect for members who attend. Details of the meeting including abstract deadlines etc can be found at <http://fertility2009.org/>. The meetings committee are facing a challenging year with the prospect of organising and running two high-quality meetings in a relatively short space of time. I am sure we are up to this challenge and look forward welcoming members to both FERTILITY 2009 in January and SRF 2009 in July.

Finally, Council is always happy to receive nominations for future Marshall Medallists and for the SRF Distinguished Scientist Award. Each should take the form of a letter of commendation accompanied by an abridged CV for the candidate detailing:

- The area of expertise of the nominee
- Major contributions of the nominee to the field of reproductive biology
- Details of any professional honours already bestowed on the nominee
- An outline of the publication record of the nominee (total number of publications, indicating year of first publication)

Although nominations can be made by any individual member of the Society (irrespective of non-statutory or statutory status), the letter of commendation should list other members of the Society prepared to formally endorse the nomination.

In the first instance, nominations for the above award should be submitted to the SRF programme Secretary via the Business Office. Feedback from members on changes to the meetings schedule outlined above or any other matters relating to SRF meetings will be gratefully received by me at [rabayase@rvc.ac.uk](mailto:rabayase@rvc.ac.uk).

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#### **Robert Abayasekara**

## Report on First World Congress on Reproductive Biology

The first in what promises to be a stimulating series of world congress on reproductive biology was held in Kailua-Kona on the Big Island of Hawaii, USA, on 24-26 May 2008. The aims of the meeting were to bring together reproductive biologists from all over the world to discuss recent international advances in reproductive research, to foster international exchange of ideas and collaborations, and to determine the priorities for future research in reproductive biology. The meeting was sponsored by our Society together with the Japanese Society for Animal Reproduction, the Australian Society for Reproductive Biology and the Society for the Study of Reproduction. It is hoped that other societies will join us in the future.

Members of SRF Council served as members of the WCRB Organizing Committee and were present at the meeting. They were: Helen Picton (University of Leeds), Henry Jabbour (The Queen's Medical Research Institute), Martin Luck (University of Nottingham) and Eduardo Roldan (The Royal Veterinary College). Members of the Society were encouraged to participate and a special "WCRB Subsidy" of £500 was available for any non-statutory member who wished to attend.

Plenary lectures, each selected by one of the sponsoring societies, were presented by Malcom Parker (Imperial College, UK), Atsuo Ogura (RIKEN Tsukuba Institute, Japan), Teresa Woodruff (Northwestern University, USA) and Marilyn Renfree (University of Melbourne, Australia). There were, in addition, 16 sessions and poster presentations.

At the end of the meeting, the Organizing Committee agreed that the meeting was a success and the suggestion of holding a future meeting, most likely in 3 years time, was supported by everyone. Both our Society and the Australian Society for Reproductive Biology expressed an interest in organizing the next World Congress and both societies will present bids in the near future to be assessed by the Organizing Committee. We trust we will be able to bring more news in the next Newsletter.

**Eduardo Roldan**

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## From the Treasurer and Company Secretary

### The financial picture

As reported in the Society's accounts, presented to the 2008 AGM in Edinburgh, the Society continues to be in sound financial health. We have substantial reserves and our income from investments, membership and journal subscriptions have enabled Council to continue with an ambitious and productive programme of charitable activities. Chief amongst these has been the support provided for younger colleagues to attend meetings, and it is pleasing to note that membership of the Society is rising.

A key development last year was the renegotiation of our contract with Bioscientifica, publishers of *Reproduction*. The new contract is simpler for both sides, with fewer penalty clauses, and reflects improvements in production, distribution and marketing systems which Bioscientifica have been able to achieve. This year, the journal returned a healthy surplus and we anticipate that this will continue for the foreseeable future, underpinned by the continued high standing of the Journal's impact factor. This year the Society funded the retrodigitisation of pre-electronic volumes of the Journal (largely *Journal of Reproduction & Fertility*) and this material should appear on line towards the end of 2008. Council took a clear decision that this valuable resource should be provided free of charge as a service to the scientific community.

The sound financial status of the Society also means that we can continue to support one or two conferences each year with some confidence. In general terms, our joint meetings with other fertility societies (e.g. Fertility 2007) usually generate a small surplus, whilst our stand alone meetings either break even or return a small loss. All meetings are run for their scientific value rather than for profit, and so this swings-and-roundabouts approach is entirely consistent with the aims of the Society. Above all, the financial security of the Society means that the Programme Secretary has the freedom to attract top quality national and international speakers, without primary regard to cost.

This year, the Society also helped to organise the first World Congress of Reproductive Biology and was one of its main sponsors. The scientific success of the Congress led the organising committee to agree that it should continue in three or four years' time. The Society's input into this endeavour can therefore be seen as an investment in the international promotion of reproductive science.

### Voting rights: An explanation

Prior to this year's AGM, there was an election to fill two vacant positions on Council. According to the Society's Articles of Association and Bylaws, only statutory members are eligible to vote in Council elections and on substantive matters brought to the AGM. A number of members have been asking why non-statutory members are not allowed to vote.

The reason lies in the history of the Society and its assets, and in its status as a charity. The current Society for Reproduction & Fertility derives from the merger, in 2001, of the Society for the Study of Fertility and the Journal of Reproduction and Fertility company. The assets of the Society originated largely from the Journal company and were previously under the control of its Council of Management. When the new Society was formed it was necessary to ensure, through the Articles and Bylaws, that those assets be properly held and managed as charitable assets.

Council members are the Trustees of the charity and make decisions about the distribution of assets for charitable purposes. Central to charitable status is the requirement that those who distribute assets may not themselves be beneficiaries. Thus Council members automatically assume statutory status, giving them the right to vote but not to receive benefits. Conversely, non-statutory members may apply for travel grants and

other forms of support but may not vote. When vacancies on Council arise, or when major decisions over the structure of the Society (enshrined in the Articles and Bylaws) are needed, it is necessary that decisions are made altruistically, in the interests of the Society as a whole and towards the achievement of its charitable aims. Only statutory members are (incontestably) in a position to do this.

There is a partial exception to this general principle. The Articles and Bylaws specify that up to two members of Council may be elected by the non-statutory membership. Our convention is that these places are taken by the postgradoc representative and representative elect, both of whom are chosen entirely by the younger (non-statutory) members of the Society. These individuals play a full part in Council meetings and sit on Council committees. They take part, like other Council members, in the nomination of the principle officers of the Society (Chair, Treasurer, General Secretary). However, they retain their non-statutory status and, unlike other Council members, do not become trustees or directors of the Society as a limited liability company (as registered with Companies' House).

I hope this explains why voting rights are as they are. As Company Secretary as well as Treasurer, it is my role to ensure that the Articles and Bylaws are upheld and that the Society meets its legal obligations as a company and a charity. The Articles and Bylaws are public documents which anyone can consult at any time. However, I like to think that ordinary members of the Society can go about their daily toil untroubled by the legal minutiae of the Society's constitution, rules and regulations. In the end, Council stands guard over these matters, but it does so without the possibility of benefit to itself.

**Martin Luck**

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## Website

The SRF website ([www.srf-reproduction.org](http://www.srf-reproduction.org)) is presently undergoing a major revamp, and a new-look site should be launched in the coming weeks. The aim of the over-haul, which has been managed by the Education and Development committee, is to make the site more visually appealing, easier to navigate and of more use to the membership by keeping the site updated regularly. It is also hoped that in time the site can develop into an online presence for the society that can act as a port of call for interested parties outside the membership.

Some of the key changes are as follows:

- A more visually appealing homepage
- Greater ease of navigation
- More rapid news updates
- Better links with the *Reproduction* website and other relevant sites
- More use of images and educational content for the lay public

In the meantime, the Education and Development committee would welcome ideas for content. We are

particularly keen to develop our list of non-SRF meetings, and develop a page for job vacancies, so if you know of any conferences that are likely to be of interest to members, or are advertising a position, please let us know and we can post it up.

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## Membership Renewal

The Society's membership year runs from the 1<sup>st</sup> December until 30<sup>th</sup> November. Unfortunately, members who join the Society part way through a year will be served with a renewal notice before they have received 12 months member's benefits. However, in the interests of keeping administration costs to a minimum it is not possible to allow members to renew on the anniversary of their application being approved.

In order to allow members the opportunity to renew, the Members Only area of the website will remain accessible using your existing password until the end of February 2009, when new passwords will be issued to those who have returned their renewal forms. If you have any difficulty in renewing your membership, or would like new copies of the renewal form to be issued, please contact the Business Office.

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## Marshall Medal / SRF Distinguished Scientist Award

Council is always happy to receive nominations for future Marshall Medallists and for the SRF Distinguished Scientist Award. Each should take the form of a letter of commendation accompanied by an abridged CV for the candidate detailing:

- The area of expertise of the nominee
- Major contributions of the nominee to the field of reproductive biology
- Details of any professional honours already bestowed on the nominee
- An outline of the publication record of the nominee (total number of publications, indicating year of first publication)

Although nominations can be made by any individual member of the Society (irrespective of non-statutory or statutory status), the letter of commendation should list other members of the Society prepared to formally endorse the nomination.

## New Investigator Awards

Recipients of the SRF New Investigator Award are selected from a short-list of eligible candidates on the basis of their abstract submission to the Annual Conference, their curriculum vitae and letters of support from senior colleagues. Eligible candidates will have completed ten years (or less) of post-doctoral research. We are currently interested in nominations for 2010.

In the first instance, nominations for the above awards should be submitted to the SRF programme Secretary via the Business Office. Please send any nominations you may have for our 2010 conference by March 1, 2009.

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## Postgraduate / Postdoc Corner

Thanks to everyone who submitted abstracts for the SRF Student prize session at the Edinburgh meeting this year. As ever the standard was extremely high and it was a pleasure for us to chair a session with five outstanding speakers, and particularly encouraging to have two finalists from continental Europe, a trend we hope will continue in the future. Congratulations go to Alison Wallace of the MRC Human Reproductive Sciences Unit, whose talk on prostaglandin regulation of angiogenesis in endometrial cancer took first prize in a hotly contested session. The Fertility 2009 meeting in Edinburgh in January will again feature an SRF student prize session, so we'd encourage all students to submit their abstracts for consideration for the Student prize when registration opens later this year.

A combination of great weather (and depending on your point of view, the Euro 2008 final) helped make the quiz and barbecue at SRF 2008 a great success. Over a dozen teams battled it out over four rounds with the title eventually going to the home team 'Henry's Heroes'. Many thanks to everyone who took part and made the evening a memorable one. We'd also like to thank QIAGEN, whose generous sponsorship of the evening enabled us to provide the barbecue at this year's event.

The SRF quiz also marked the departure of Dr Michelle Myers as postgrad/doc representative. We wish Michelle the best of luck for the future and thank her for all her efforts over the last couple of years. Following an election at the Edinburgh meeting, we welcome on board Mhairi Laird, a PhD student at the Sutton Bonnington Campus of the University of Nottingham, as the new postgrad/doc representative.

Finally, if you've any ideas for developing the postgrad/doc side of the society – such as events, online resources, career development etc - we'd very much like to hear from you. Feel free to email either Andy ([a.childs@hrcu.mrc.ac.uk](mailto:a.childs@hrcu.mrc.ac.uk)) or Mhairi ([mhairi.laird@nottingham.ac.uk](mailto:mhairi.laird@nottingham.ac.uk)) with your ideas - we look forward to hearing from you!

**Mhairi, Andy and Michelle.**

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## Publications

Dear SRF Members

I have now enjoyed some six months as Editor-in-Chief of *Reproduction* having taken over from John Carroll at the start of the year. John is a tough act to follow. He made several advantageous changes to the direction and format of the journal which have helped substantially to maintain its standing and reputation in the reproductive biology field. The product of John's labours were felt again a couple of weeks back when

the latest impact factors for journals were released. *Reproduction* showed a modest improvement from 2.958 to 2.962 (in my world that rounds up to 3 and is what you need to tell your colleagues searching for a quality journal to publish in!). A special thanks to John for all he has achieved in steering the journal forward in the last four years.

What has been my impression of the journal since taking over? Well, I use the word 'enjoy' above and that's an accurate description of my feelings. So much of the enterprise runs smoothly for two important reasons. First and foremost because we have a well-designed and rigorous peer review system, supported by state-of-the-art online technology, to help us critically evaluate every submission. I am indebted to the team of Editorial Board Members (EBM) who not only appraise papers assigned to them but also organise the reviewers and come up with the recommendation which lands in my 'Final Decision' box. Invariably, despite careful scrutiny of these papers, I come to the same conclusion as they recommend, making my job - either to raise or lower the thumb, Julius Caesar style - one I can take with confidence and based upon sound judgement. Second, the smooth running of the journal is thanks to the Bioscientifica editorial office staff based in Bristol who help me with all the administrative and procedural issues that come up. In short, the efficiency, professionalism and enthusiasm of all those around me have made my honeymoon period with the journal just that, an enjoyable and stimulating period that I'm so glad to have taken on.

Like all journals, we are constantly considering how best to maintain our scientific quality in papers with an eye on what may drive the outcome of our next impact factor rating. The regular Reviews and Focus issues have been a successful venture for us in recent years thanks to the tireless effort of our Reviews Editor, Kevin Sinclair. Kevin and I have planned out new ways to consolidate these important components of the journal's portfolio with the formation of the Reviews Commissioning Group, chaired by Kevin and comprising Ann Drummond, David Gardner, Henry Jabour, Tom Moore and Karl Swann, an experienced and wise team from the EBM to help formulate and commission the cutting-edge topics and authors for new Reviews and Focus issues. This formalised arrangement is to run alongside ad hoc suggestions made to us from the EBM generally or indeed from SRF members (my mail is below) I have also modified the scope of the journal somewhat to further encourage submission of Research papers in the fast-moving and newsworthy areas of reproductive biology such as epigenetics, reproductive origins of health and developmental models for disease as well as our more traditional areas. There are further changes planned to increase the quality of our submissions but more on these in later Newsletters.

I will close by asking all Society Members to keep in mind the continued wellbeing of *Reproduction* – encourage you institution library to subscribe if it currently doesn't, send us your best papers for publication, and always feel free to let me know your views on any issue that concerns you or suggestions for continued success ([tpf@soton.ac.uk](mailto:tpf@soton.ac.uk)). Thanks to you all.

**Tom Fleming**

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## The greatest race on earth

There are many great challenges that life has to offer ranging from adrenaline pumping sailing over great oceans of the world, to running through swelteringly hot conditions over the deserted African planes. Though these challenges are only ever taken up by a minority of brave individuals, one race central for the male sex is hugely understated. Could swimming the length of the female reproductive tract be the greatest race on earth? Unbelievable as it sounds, this journey is as treacherous, dangerous and deadly as climbing up Everest, swimming through shark infested waters or biking through unkempt lands. The chaps strong enough to endure this journey are the sperm, millions of which line up ready for the race to begin- yet only one will ever be successful and reach the lonely oocyte. To ensure that at least one sperm from the male who has managed to copulate with a female wins this race, many different strategies are undertaken ranging from testis size to sperm size and number. This article will discuss various dangers sperm must encounter to achieving the ultimate goal- guaranteeing paternity.

So what hazards actually await the sperm on their epic long awaited adventure? First they need to be deposited into a female willing enough to allow copulation before the starting gun of the race can actually begin, and this can potentially be a huge hurdle requiring much time, energy and consideration depending on the species. Many species have the alpha male dominance policy determined by rule of territory, where the title of dominant male can only be given to the strongest and most brave amongst the group. Human males adopt more complex strategies where much time is invested in courting and wooing of the female. Upon finding the desired female, males must employ enough sexual behaviours to allow copulation to ensue. This in itself can pose a large survival gamble, as both must be aware of other males muscling in and brandishing their sexual desires potentially sparking into blazing conflict, being eaten or injured by predators, and even of the passage of disease (Daly 1978). In many species, the idea of intercourse is neither attractive nor pleasant with males persistently revved leaving females to battle off unwanted attention themselves, ultimately consuming large quantities of energy (Daly 1978). During mating season, the risks involved can be translated into the wounds seen on both males and females of the Rhesus monkey (Vandenbergh & Vessey 1968).

More challenges that the male has to grapple with before it deploys its unique army to invade the female tract and rescue the oocyte, include how large this sperm army should be. Three main factors dominate testicular production of sperm: energy resources, volume of sperm producing tissue and levels of sperm competition from other males all bidding for the same prize. For all the dangers the sperm will face in the female, it must be trained to such a degree where the male can rely on a handful reaching the oocyte, and eventually one capturing it. This training program is spermatogenesis. The time invested by the male in putting their immature spermatozoa through spermatogenesis is important such that the longer this cycle, a more elite group emerge (Peirce & Breed 2001). Therefore in a world with too few females for the testosterone driven males, the degree of sperm

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## Honorary Members

Would you like to nominate a colleague for the distinction of becoming an Honorary Member of the Society for Reproduction and Fertility? If you consider someone to be worthy of this tribute, please pass their details forward to the General Secretary, giving justification for your nomination and the name of a second, supporting member of the Society. Proposals for Honorary Membership may be put forward by both Statutory and Non-Statutory members of the Society.

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## Trust for Research and Education in the Biology of Reproduction

The attention of SRF members is drawn to the TREBR which was established in 1982, under the management of independent trustees, to award travel and subsistence grants to scientists working in reproductive biology. The Trust was established to meet the needs of those who are ineligible to apply to the SRF for travel funds. Applications will therefore be considered from non-members of the Society for Reproduction and Fertility, and from members of the SRF who are not eligible for travel grants (i.e. Statutory members). Funds may be used for attendance at scientific meetings or to support visits to other laboratories. Applications made by visiting scholars from developing countries are particularly encouraged. Applicants must be sponsored by a member of the Society. The maximum grant is £350. Further information on the Trust and application forms are available from the chairman:

Prof. APF Flint, School of Biosciences, University of Nottingham, Sutton Bonington, Loughborough, Leics LE12 5RD. [Anthony.Flint@Nottingham.ac.uk](mailto:Anthony.Flint@Nottingham.ac.uk).

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## Undergraduate essay competition

This year for the first time the SRF held a student essay competition for undergraduates studying in the UK or Ireland. The essay had to be about an aspect of reproductive biology and was assessed on scientific content, style and topicality. The competition was a great success with a wide variety of topics covered. The quality of the essays was very high, but three entries stood out for their scientific content but also skill in engaging not just scientists in the field but also more general readers. The winner of the competition was Hannah Dhoyne of King's College London, who received a prize of £500 and attended the SRF annual conference, with the costs of her registration, accommodation and travel covered. The second prize of £250 went to Joanne Girdler of the University of Southampton, and the third prize of £100 went to Emma Grieg of King's College London.

The winning essay by Hannah Dhoyne is reproduced below. This, and the other two winning essays can be viewed on the SRF website.

competition will be greatest (Hosken & Ward 2001). For males, it is a matter of quantity over quality in such male intense populations leaving them to develop larger testis packed full of spermatogenic tissue and fast tracking their spermatozoa through an enhanced training cycle. Such sperm does not fulfil supreme quality measures with regard to its morphology or motility. Gage & Morrow were the first to experimentally show that increased spermatozoa production or smaller spermatozoa in such males was more successful in the competition for the egg (Gage & Morrow 2003). On the opposite side of the spectrum, animals with low levels of inter male competition have very small testis (spinifex hopping mouse), with longer cycles of spermatogenesis (Peirce & Breed 2001).

After obtaining a female and depositing the load of swimmers accelerating towards the oocyte, the sperm themselves face several obstacles. Their journey is littered with hostility initially starting with the first port of call, the vagina. Here sperm can expect an acidic environment and the arrival of the female immune defence force. However, sperm at this stage are coated in their escort medium from the penis - the seminal fluid - which acts to protect it from such pH changes. With regard to dodging the immune system, sperm are laced in inhibitors provided by the seminal fluid (Suarez & Pacey 2006). Once past the vagina, into the cervix they now face a huge physical barrier that will end a majority in their journey - the cervical mucus. Despite the daunting presence the cervical mucus provides, the cervix in itself can harbour sperm and allow a constant trickle up towards the uterus. The few surviving sperm that exit the cervix are those who have gone through a rigorous surveying process which is the females' only means of selecting which genes will fertilise her oocyte (Suarez & Pacey 2006). Freundl et al showed spermatozoa with intact outer shapes had a greater chance of surviving the blockade from cervical mucus and those left at the top of the female tract were defect free (Freundl et al 1988).

As the remaining sperm have undergone a stringent selective criteria, leaving all undeserved behind, the female tract changes from a hostile, unkind area to one which promotes fertilisation. It does this by aiding sperm in their journey pushing them closer towards the ampulla of the fallopian tubes where the sleeping beauty oocyte waits her heroic prince sperm. This moment has been unravelled by high resolution ultrasound probes which enable us to see dynamic movements of the uterus which during the follicular phase of the menstrual cycle have been seen to be cranial in direction, resulting in the delivery of sperm to the distal fallopian tubes (de Zeigler et al 2001).

The final frontier in a sperm's journey is transforming it from a regular swimmer and injecting a shot of energy enabling it to zoom over to the oocyte. This process is known as capacitation and can only occur as sperm travel through the female tract inducing morphological changes allowing these final contenders to become fertile and achieve a fully functional zygote (de Lamirande et al 1997). From this, in the capacitation process, the female can be seen to be a hugely important incubator causing the maturation of sperm via reorganisation of surface proteins, thus opening the window of sperm fertility (de Lamirande et al 1997).

Gamete fusion requires an intimate interaction using the phenomenon of cell adhesion. The oocyte is dressed in two special coats, the zona pellucida and the cumulus layer, and ovulation leaves them to be picked up by the ciliated infundibulum (Talbot et al 2003). After the oocyte has been escorted to its waiting lounge, the first sperm which arrives must latch onto the zona pellucida (Talbot et al 2003). The zona pellucida contains zona pellucida glycoprotein (ZP3) which is a potent drive for the acrosome reaction to occur, and it is this final catalyst which allows the clinging sperm to finally burrow through the outer coating of the oocyte (de Lamirande et al 1997). Thus the journey is over, blood sweat and tears aside, the final goal of sperm and egg encounter has been achieved and fertilisation results.

As can be seen the sperm are brave cells that must endure the unfriendliness of the lower female reproductive tract, the gauntlet of the cervical mucus and timing pressures to allow them to be in a fit enough state to fertilise the egg upon their meeting. Due to the many hazards these sperm must endure, it is not surprising that the many millions that excitedly start the race from the male ejaculate quickly fall by the wayside at such an intimidating adventure. However as has been discussed, the female tract alters from an unwelcoming, barren area to one which longs for a foetus, and thus helps sperm finish its journey aiding movement via contractions, and maturation. Thus the strategies undertaken by the successful sperm can be transmitted to later generations. So there seems only one thing left to say, Ready, Steady, Go!

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