

Annual Report for Faculty of Medicine Funded Centres, Core Facilities and Networks

The Annual Report should be set in the context of the Centre's, Core facility's and Network's overall goals and objectives, programs and research priorities, performance indicators outlined in the application (or subsequently developed), activities and strategies.

Please provide the following:

1. Name of Centre, Unit or Institute:

Centre for the Study of Reproduction / Centre d'études sur la reproduction

2. Name and contact information of the Director and/or Administrative Assistant:

Director	Prof. Hugh Clarke	hugh.clarke@mcgill.ca	934-1934 x34748
Admin Asst	Ms. Aliea Jamal	csr-cer@mcgill.ca	398-2584

3. Is the centre recognized as an official Senate approved McGill Research Centre?

Yes X No

4. The date the centre received Senate approval as an official McGill Research Centre

5. A summary of the overall goals and objectives, programs and research priorities and any changes to these that may have occurred during the past year. Please indicate the extent to which the objectives have been met. **(limit 200 words)**

With over 20 funded laboratories taking leading international roles, McGill holds an enviable position as one of the most comprehensive and intense sites for research in reproduction. The Centre for the Study of Reproduction (CSR) is the home-base for these highly diversified laboratories located across McGill campus. The CSR has four main objectives. First, by providing exceptional training opportunities for graduate students and post-doctoral fellows we build future research capacity in reproductive and developmental biology. Second, by supporting new research collaborations among our members, we increase the interactions among members thus strengthening reproductive research across McGill. Third, through our annual Research Day featuring internationally renowned scientists as keynote speakers, we increase the visibility of the CSR and its members at McGill and in the international community. Fourth, by our active participation in other networks (e.g., RQR, REDIH), we promote interactions with investigators elsewhere in Quebec, Canada, and internationally.

We have established these goals in 2008 and have continued to make them the focus of our efforts since then. These objectives respond to the expressed needs of our members and, as listed below, we have been extraordinarily successful in achieving our ends. Notably, 16 different laboratories directly benefited from our support programmes in 2010-2011 alone,

and members of 25 different labs attended our Research Day. These numbers illustrate that the CSR serves the needs and is an important component of the research activity of all of our members.

6. Please document **the major achievements** resulting from the use of the Funds from the Faculty, including any advances in knowledge, relevant publications, or international collaboration. You may select from the menu of reporting items/performance indicators in appendix 1 that may be relevant, noting that the menu list is not exhaustive. (Please limit your response to a maximum of 1 page)

1. We awarded 9 new salary fellowships to trainees, following review of applications by CSR members not in potential conflict-of-interest. Most recipients of CSR fellowships subsequently obtain provincial or national fellowships, repaying many-fold the initial CSR investment.

2. We awarded 12 travel bursaries. These enable trainees to attend scientific conferences where they can receive critical feedback and build professional networks.

3. We supported 3 new research collaborations, following review of applications by qualified scientists who are not members of the CSR. This seed money enables members to acquire preliminary data to support full applications to CIHR.

4. We again hosted our Annual Research Day in May, attended by 155 CSR members and trainees. We have been able to attract internationally renowned reproductive and developmental biologists to participate, heightening the impact and reputation of the CSR. The 2010 speakers were Dr. Teresa Woodruff, Director of the Institute for Women’s Health Research at Northwestern University Feinberg School of Medicine, Dr. Ina Dobrinski of the University of Calgary, and Dr. Artur Kania of the Institut de Recherches Cliniques de Montréal.

5. We continued our programme of hands-on workshops, offering an Introduction to Intracytoplasmic Sperm Injection. To our knowledge, this is a first in Canada. We also sponsored a special seminar on writing a scientific manuscript that was first offered at the RQR Annual Meeting in November 2010 and repeated at the REDIH meeting in January 2011. In response to numerous requests, we made the presentation freely available for use outside these meetings.

6. We continued to expand our bilingual website, adding regular updates of news, upcoming seminars and meetings, and a paper-of-the-month.

7. Please provide a **List of Members** (Full, Associate, Trainee noting whether graduate student or post-doctoral fellow) **if not already on your website** and all institutional affiliations current up to the date of the Annual Report. Add rows as necessary.

A list of members is available at http://www.medicine.mcgill.ca/csr-cer/members_en.htm

A list of trainees is available at

http://www.medicine.mcgill.ca/csr-cer/members_students_en.htm

Last, First Name	Member Type	Institutional Affiliation(s)
Please see above		

8. Please describe how your activities align with the Academic or Research mission of the Faculty of Medicine and/or other Faculties at McGill focusing on the activities for the current year and strategic plans for the subsequent year (**limit 200 words**)

Reproductive and developmental biologists focus on understanding the processes of cellular proliferation, communication, and differentiation during the development of an organism. This knowledge also provides a framework for understanding genetics and epigenetics, the biology of stem cells, and complex multicellular systems. Moreover, understanding how these processes occur normally is essential in order to understand how they become perturbed in disease and cancer. Thus, reproductive and developmental biology underpin biological research.

The CSR supports a range of activities, described elsewhere in this report, that build research capacity in science by training highly qualified personnel. Our members work closely with the McGill-MUHC Reproductive Centre, where advances in basic science are translated to clinical practice. During the next year, we will extend our training mission by providing more technique-workshops. In addition, we will develop and present a series of public lectures on topics related to reproductive biology. These are especially pertinent in view of the new public funding for assisted reproduction, and will enable individuals considering this process to better understand it.

9. Please provide the **URL of the Research Centre's, Core Facility's or Network's web site.**

Note: The Research Centre's, Core Facility's or Network's website should contain the following information:

- all sources of funding support,
- the List of Members and their institutional affiliation,
- the activities supported by the Research Centre, Core Facility of Network, and
- the Annual Report.

URL: <http://www.medicine.mcgill.ca/csr-cer/>

10. Other information:

Please indicate how the Research Centre, Core Facility or Network has:

- Tackled or plans to tackle issues in a manner that may not otherwise have been achievable without the financial support of the Faculty of Medicine
- Increased or is planning to increase the scale and focus of research activities
- Facilitated multidisciplinary, multi-institutional or international collaborations
(Please limit response to **200 words**)

The financial support of McGill is essential to the CSR. The funding (\$55,000 annually) provided to us by the RQR is contingent on the support provided by McGill. The formal commitment made by McGill is explicit in the application that was funded by FQRNT (March 2011 – March 2017). The funding provided by McGill together with the funding from the RQR enables the CSR to maintain our activities. Importantly, this funding structure means that every dollar invested by McGill is more than matched by a contribution from the RQR.

During 2008-2011, the CSR focused on establishing core programmes and activities. During the next three years, we will maintain these, while expanding into new areas. Specifically, we will increase the number of technique-workshops, adding Biochemical Tools to Study Epigenetics, Bioinformatics, Cell Culture and Transfection, and Stem Cell Biology. We will also develop a program of Scientific Cafes, holding public lectures on subjects related to reproduction that are of interest to the lay community. In addition to these local and community-outreach activities, we are

pleased and proud that the CSR will host the 2013 annual meeting of the largest group of reproductive biologists in the world, the Society the Study of Reproduction.

The Year End Financial Report reports on:

- Expenditure of funding provided by the Faculty of Medicine and other sources, towards meeting the objectives of the Research Centre, Core Facility or Network; and
- Details of any in-kind contributions provided to the Centre, Core Facility or Network.
- See **Appendix 2** for the “Year End Financial Report” form to complete

Appendix 1

Menu of Performance Indicators

The following (non-exclusive) list contains possible activities on which Research Centres, Core Facilities or Networks might report.

Quantitative: Include, as appropriate

- Number of graduate and post-graduate students funded to do various activities;

Fellowships: 22 applications; 9 awards (\$5,000 each)

Name of trainee	Supervisor
E. Bang*	D. Bernard
C. Chantoulos	S. Kimmins
B.-Z. Xu	T. Taketo
J. Yeh	M. Nagano
L. Dupuis	R. Duggavathi
C. Pagano*	C. Goodyer
R. Reddy*	R. Slim
M. Rone*	V. Papadopoulos
T. Revil	L. Majewska

Awardees indicated by an asterisk begin 1 April 2011 and will be paid from 2011-2012 budget

Travel bursaries: 12 (\$250 each)

Name of trainee	Supervisor
S. Banh	B. Hales
G. Bardai	B. Hales
D. Chan	J. Trasler
C. Dayan	B. Hales
G. Delbes	B. Robaire
A. Erman	C. Goodyer
F. Paradis	B. Hales
C. Park	D. Dufort

C. Paul	B. Robaire
A Schlissler	B. Hales
F. Paradis	B. Hales
B. Xu	T. Taketo

- Number of proposals from participants to the Centre, Core Facility or Network and the number of activities funded;

Proposals for new collaborations: 7

Funded: 3

Investigators	Title of proposal	Award
L. Majewska J. Majewski	Alternative splicing plays an important role during early mouse development	10,000
S. Kimmins D. Bernard	Determining the function of the histone H3 demethylase, lysine specific demethylase 1(KDM1) in gonadotrope function and fertility	10,000
V. Papadopoulos C. Rohlicek	Do di-(2-ethylhexyl) phthalate-induced changes in steroid production affect blood pressure in the adult rat?	10,000

- Governance: provide details of management meetings. For example, membership, frequency, attendance, the nature of the meetings and the outcomes.

Agenda and minutes of the meetings of the executive committee and of the 2011 Annual General Meeting are appended (minutes of 2011 AGM not yet approved).

- Number of workshops, conferences or seminars conducted and the number of attendees (include the number of early career researchers, graduate and/or post-graduate students attending);

Workshop

Introduction to intracytoplasmic Injection 6 May 2010 7 participants

Scientific conference

CSR Research Day 19 May 2010 155 attendees

- Number of visits, both by members to National or International destinations, events, and short and long term visits by visiting scientists to McGill;

Our members are frequently invited to speak at national and international conferences. We also host visitors, such as the guest speakers for our annual Research Day.

- Number of outreach activities including public lectures (or other forms of engagement with people outside the research community including schools, industry and government agencies);
- Number of publications produced, and their impact factors (only identify those publications that are directly related to the research centre, core facility or network activity);

Our members have published 106 manuscripts listed in PubMed since 2010-01-01. All relate to the research activities of our members; nonetheless, it is not possible to define some as directly related and others indirectly related to the activities of the CSR. A list of the publications is appended.

- Number of targeted activities:
- involving research interaction for graduate and postgraduate students

**Intracytoplasmic sperm injection workshop (May 2010)
Research day (annual) (May 2010)**

Our travel bursaries (12 awarded) enable students to attend and present their research at scientific conferences

- Industry stakeholder interactions.
- Number of web hits and articles downloaded;
- Survey of Centre, Core Facility or Network participants to ascertain usefulness and user-friendliness of web site;
- Number of Federal and Provincial grant proposals and number of successful proposals as a result of membership in the Centre, Core Facility or Network;

Successful CIHR Operating Grant applications

March 2010 competition:	2
Sept 2010 competition:	4
March 2011 competition	2

- What/how much additional funding was generated that was directly attributable to activities of the Centre, Core Facility or Network;

\$55,000 awarded by the Réseau Québécois en Reproduction (RQR). The RQR includes many members from McGill and is supported (2011-2017) by the FQRNT. The RQR provides \$55,000 annually to the CSR. This funding is contingent upon McGill maintaining its commitment, specified in the application to the FQRNT submitted in 2010, to provide \$46,000 annually to the CSR.

- Prizes, special awards to member(s) as a result of Centre, Core Facility or Network activities.

Qualitative: Describe, as appropriate, aspects of:

- Identify those activities/outcomes which may not have occurred without the formation of the Centre, Core Facility or Network.

Annual Research Day sponsored by the CSR, held each year since 2009, attended by 140-150 trainees and members of the CSR. In 2010, over 25 different labs were represented at the meeting.

Fellowship support to graduate students and post-docs (2009, 2010, applications due 15 July for 2011)

Travel bursaries to grad students and post-docs (2009, 2010, 2011)

Technique workshops: Spermatogenesis (2009); ICSI (2010); Epigenetics (scheduled 2011), Spermatogenesis (scheduled 2011), Identification of Healthy Sperm (scheduled 2011).

Seed money to support new collaborations (2009, 2010, applications due 15 July for 2011).

New CIHR operating grants received by CSR members

Cyr	Mar 2010	5 yr	639,871
Hales	Mar 2010	5 yr	613,554
Clarke	Sept 2010	4 yr	534,320
Papadopoulos	Sept 2010	5 yr	779,382
Slim	Sept 2010	3 yr	371,673
Trasler	Sept 2010	5 yr	773,775
Naumova	Mar 2011	5 yr	716,290
Wing	Mar 2011	4 yr	597,516

- What sort of different sharing /collaboration (research ideas, facilities, etc) arose because of the Centre, Core Facility or Network;

Through our 'New Collaborations' programme, the CSR has encouraged new research initiatives. The accompanying Table shows that many new projects, involving a broad cross-section of our membership, have been initiated thanks to CSR support.

	Investigators	Subject	Award
2009	R. Duggavathi	Molecular mechanisms of leptin-receptor signaling in ovarian granulosa cells	10,000
	M. Nagano P. Chan	Characterization of human spermatogonial stem cells	10,000
	H. Clarke J. Trasler	Role of early epigenetic modifications of histones in establishing correct patterns of DNA methylation during embryogenesis	5,000
	M. Culty S. Wing	Role of ubiquitin proteasome system in testicular gonocytes functions	5,000
	B. Hales D. Bernard	Elucidation of the molecular mechanisms by which warfarin ameliorates retinoid teratogenicity	5,000
	C. O'Flaherty P. Chan, A. Zini	Characterization of peroxiredoxins in patients with clinical varicocele or idiopathic infertility	5,000

2010	L. Majewska J. Majewski	Alternative splicing plays an important role during early mouse development	10,000
	S. Kimmins D. Bernard	Determining the function of the histone H3 demethylase, lysine specific demethylase 1(KDM1) in gonadotrope function and fertility	10,000
	V. Papadopoulos C. Rohlicek	Do di-(2-ethylhexyl) phthalate-induced changes in steroid production affect blood pressure in the adult rat?	10,000

We also maintain on our website a list of specialized equipment that CSR members have made available for use by other members.

- Effectiveness of governance processes in place;

Governance of the CSR is overseen by an Executive committee, comprising the Founding Director, Director, Associate Director, and Members-at-Large. Executive members are elected at the annual general meeting (AGM) for a 3-year term. In June 2011, Dr. Clarke was elected as Director. Dr. Robaire, outgoing director, was named Founding Director. Dr. Culty, formerly Member-at-Large, was named Associate Director. In response to the substantial increase in CSR membership since 2008, the number of Members-at-Large was increased at the 2011 AGM from two to three.

The Executive Committee meets regularly; 7 meetings were held during the 2010-2011 reporting period. All meetings are minuted, and the minutes are examined and modified if necessary prior to approval at the subsequent meeting. All decisions taken by the Executive are publicized by emails to CSR members and on the CSR website. Deadline dates for all competitions are clearly posted on the CSR website and reminder emails are sent to all members. All fellowship and grant applications are reviewed and ranked by individuals, within or without CSR, having no potential conflict-of-interest. Blinded rankings are used by the Executive to set cut-offs in accordance with the availability of funds.

The CSR holds an Annual General Meeting to which all members are invited. Strategic directions and priorities are discussed at these meetings, after which the Executive carries out the mandate conferred by the membership.

- Different kinds of research generated – research building capacity, or removing impediments to research;

Our Fellowship, New Collaborations, and Travel Bursary programme all build research capacity.

- Breadth of Centre, Core Facility or Network - qualitative aspects;

We have more than 25 faculty members, whose research interests span a wide range of reproductive biology, and who are physically located throughout main campus and at MacDonald College. As shown in the Table above, we support a wide range of research

initiatives.

- Multi-disciplinary collaboration

Supported through our New Collaborations programme.

- Increased or new collaboration and partnerships as a result of Centre, Core Facility or Network activities, and with different types of end users (e.g. industry, government and community groups);

Our New collaborations programme has been highly successful at achieving this aim.

- What workshops and similar meetings the Centre, Core Facility or Network provided financial support to – number, the level of engagement, the purpose and the outcomes (including the number of opportunities for inter-disciplinary research);

Workshop

Introduction to intracytoplasmic Injection	6 May 2010	7 participants
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Scientific conference

CSR Research Day	19 May 2010	155 attendees
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- What mechanisms are in place for communication within the Centre, Core Facility or Network membership (e.g. email, newsletters, website, etc);

We host a fully bilingual website that is regularly updated with news, announcements of upcoming competitions, seminars and meetings, and a paper-of-the-month published by a CSR member. All competitions, seminars and meetings are also advertised to members through email.

- National, International activities and/or visitor programs - information about the level of engagement at seminars and workshops (e.g. number of participants) and how these events have contributed or are likely to contribute to the strategic goals of the Centre, Core Facility or Network;

We invite internationally recognized speakers to participate in our annual Research Day. These speakers also meet individually with CSR members and trainees. This enables our members to make new contacts and offers opportunities for new collaborations and research initiatives.

- What exceptional successes, if any, have occurred during the reporting period;

We are pleased that our members have been very successful at obtained major grant support (eg, CIHR) despite the current funding climate. We continue to be able to attract exceptional scientists from outside McGill to participate in our Research Day.

- What disappointments, if any, occurred during the reporting period;

We regret that we have insufficient funds to support more of our highly talented graduate students and post-docs, or to provide larger grants through our New Collaboration programme.

- How new skills have been acquired as a result of research technology;

Participants in our technique workshops acquire new and highly specialized skills. For this reason, we are forced to limit enrollment in each workshop.

- Any surveys carried out of members to ascertain any benefits gained from membership of the Centre, Core Facility or Network;
- Outreach activities and how these may have been reported by the media;
- Collaborations between other Centre, Core Facility or Networks at McGill;
- Linkages with international Research Networks;

We work closely with the Réseau Québécois en Reproduction (RQR) and the CIHR Training Program in Reproduction, Early Development and the Impact on Health (REDIH)

- Development of tools, software, databases; and
- How the networks between researchers are being strengthened as a result of using web-based and other technologies.

**Publications by CSR Members 2010-01-01 – current
(downloaded from PubMed)**

- 1: Chan P. Management options of varicoceles. *Indian J Urol.* 2011 Jan;27(1):65-73. PubMed PMID: 21716892; PubMed Central PMCID: PMC3114590.
- 2: Puzhko S, Goodyer CG, Kerachian MA, Canaff L, Misra M, Jüppner H, Bastepe M, Hendy GN. Parathyroid hormone signaling via G α s is selectively inhibited by an NH(2) -terminally truncated G α s: implications for pseudohypoparathyroidism. *J Bone Miner Res.* 2011 Jun 28. doi: 10.1002/jbmr.461. [Epub ahead of print] PubMed PMID: 21713996.
- 3: Papadopoulos V. From benzodiazepines to peripheral and brain steroid biosynthesis. *Pharmacol Res.* 2011 Jun 17. [Epub ahead of print] PubMed PMID: 21704163.
- 4: Wing SS, Lecker SH, Jagoe RT. Proteolysis in illness-associated skeletal muscle atrophy: from pathways to networks. *Crit Rev Clin Lab Sci.* 2011 Jun 24. [Epub ahead of print] PubMed PMID: 21699435.
- 5: Yeh JR, Zhang X, Nagano MC. Wnt5a is a cell-extrinsic factor that supports self-renewal of mouse spermatogonial stem cells. *J Cell Sci.* 2011 Jul 15;124(Pt 14):2357-66. Epub 2011 Jun 21. PubMed PMID: 21693582.
- 6: Akoury E, El Zir E, Mansour A, Mégarbané A, Majewski J, Slim R. A Novel 5-bp Deletion in Clarin 1 in a Family with Usher Syndrome. *Ophthalmic Genet.* 2011 Jun 15. [Epub ahead of print] PubMed PMID: 21675857.
- 7: Messaed C, Chebaro W, Roberto RB, Rittore C, Cheung A, Arseneau J, Schneider A, Chen MF, Bernishke K, Surti U, Hoffner L, Sauthier P, Buckett W, Qian J, Lau NM, Bagga R, Engert JC, Coullin P, Touitou I, Slim R; HM Collaborative Group. NLRP7 in the spectrum of reproductive wastage: rare non-synonymous variants confer genetic susceptibility to recurrent reproductive wastage. *J Med Genet.* 2011 Jun 9. [Epub ahead of print] PubMed PMID: 21659348.
- 8: Papadopoulos V, Lecanu L. CAPROSPINOL: DISCOVERY OF A STEROID DRUG CANDIDATE TO TREAT ALZHEIMER'S DISEASE BASED ON 22R-HYDROXYCHOLESTEROL STRUCTURE AND PROPERTIES. *J Neuroendocrinol.* 2011 May 28. doi: 10.1111/j.1365-2826.2011.02167.x. [Epub ahead of print] PubMed PMID: 21623958.
- 9: Tran S, Lamba P, Wang Y, Bernard DJ. SMADs and FOXL2 Synergistically Regulate Murine FSH{beta} Transcription Via a Conserved Proximal Promoter Element. *Mol Endocrinol.* 2011 Jul;25(7):1170-83. Epub 2011 May 26. PubMed PMID: 21622537.
- 10: Nothdurfter C, Rammes G, Baghai TC, Schüle C, Schumacher M, Papadopoulos V, Rupprecht R. TSPO (18 kDa) AS A TARGET FOR NOVEL ANXIOLYTICS WITH A FAVOURABLE SIDE-EFFECT PROFILE. *J Neuroendocrinol.* 2011 May 24. doi: 10.1111/j.1365-2826.2011.02166.x. [Epub ahead of print] PubMed PMID: 21609361.
- 11: Park S, Zeidan K, Shin JS, Taketo T. SRY upregulation of SOX9 is inefficient and delayed, allowing ovarian differentiation, in the B6.Y(TIR) gonad. *Differentiation.* 2011 Jul;82(1):18-27. Epub 2011 May 17. PubMed PMID: 21592645.