

SOCIETY FOR FREE RADICAL
RESEARCH
(Australasia)



NEWSLETTER October 2000

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This is the second and final Newsletter of SFRR (Australasia) for 2000. The Executive would like to thank all those who have contributed to SFRR(A) [particularly the Newsletter] over the last year. As always, the Executive will continue to keep members informed of recent and up-coming events in Australasia and elsewhere around the globe via the the current 2000-2001 "Diary". This Newsletter will be sent via E-mail to the greater membership and only a few members without e-mail access will receive actual hard copies via surface mail. In an effort to cut overhead costs we urge all members to gain access to e-mail and please forward your e-mail address to the Secretary, Dr Paul Witting. Also, please feel free to submit relevant articles to the Secretary if you wish the information to be made available to the members of SFRR(A).

From the President:*Dear Fellow Radicals*

I would like to take this opportunity to encourage all members who are still deciding about coming to Wellington for our annual meeting to get their registration form in the fax machine ASAP. We have about 50 registrants so far and the program is clearly going to be up to the usual high standard of SFRR (Australasia). There are several excellent speakers from the USA , Australia and New Zealand on the program. I appreciate the expense incurred travelling from Australia but our dollar has never been in worse shape, so come on and take advantage of it. The venue is terrific and the science will be great.

We have had to change the hotel accommodation because the initial hostel was not up to standard. I apologise for any inconvenience or confusion this may have caused registrants. Accommodation will now be at the Ibis Hotel, which is in walking distance from Te Papa. We have booked a number of twin rooms at a cost of \$99 per room per night. Breakfast is not included in this price. Please let us know if there is someone you would prefer to share a room with. For those staying at the hotel after Sunday night, the cost rises to \$111 per night.

For those who have registered for the conference, please consider submitting your work as short paper to Redox Report. Full details regarding the submissions for short papers are given at our web site at <http://www.chmeds.ac.nz/go/freerad/well2000.htm>. I feel the concept of the short papers is a good one as it helps to promote our society and the science that is going on downunder.

There will be an annual meeting of the society during the meeting in Wellington. If you have any points you would like to be discussed at the meeting, please get in contact with me and I'll put them on the agenda.

I look forward seeing you in Wellington.

Tony Kettle

Final Announcement: The Annual Meeting of the Society for Free Radical Research Australasia.



Oxidants, Antioxidants and Nutrition.

Wellington, New Zealand.

9-11 December 2000.



REGISTRATION FORM

Deadline for registration and abstracts - September 22, 2000.

Personal Information <small>(please put details as you would like them to appear on all identification)</small>			
Last name	_____		
First name/s	_____		
Place of work	_____		
Mailing address	_____		
City	_____	State	_____
Country	_____	Postcode	_____
Telephone (wk)	_____	Fax (wk)	_____
Email	_____		
Presentation (tick form of presentation)			
	Poster	Oral	
Registration	Financial SFRR Member	NZ \$175	= _____
	Non-member	NZ \$225	= _____
	Student	NZ \$125	= _____
	One day registration	NZ \$125	= _____
	Late registration (<i>after 22 Sept</i>)	NZ \$250	= _____
<i>Please note; if you wish to attend more sessions of ComBio2000 other than the combined Monday session, then please register separately with the ComBio2000 conference organisers.</i>			
Accommodation	Do you require accommodation?	yes <input type="checkbox"/>	no <input type="checkbox"/>
		<i>per room</i>	<i>no. nights</i>
	Single Room (Fri, Sat, Sun nights)	NZ \$99	_____ = _____
	Single Room (Mon, Tues, Wed, Thurs nights)	NZ \$111	_____ = _____
	Twin/Double Room (Fri, Sat, Sun nights)	NZ \$99	_____ = _____
	Twin/Double Room (Mon, Tues, Wed, Thurs)	NZ \$111	_____ = _____
	Breakfasts	NZ \$15	_____ = _____
	<i>Dates accommodation required</i> _____		
	<i>Name of registrant you wish to share accommodation with.</i> _____		
	<i>Do you wish us to organise a delegate to share with?</i> _____		
Conference	Per person	NZ \$40	_____ = _____
<i>Please describe any special food requirements.</i>			
Total \$ NZ			
Payment			<i>Total payable</i>
<small>(Please include total amount being paid, including other registrants if applicable.)</small>	By Bank Cheque (\$ NZ) (<i>make cheque out to "Oxidants 2000"</i>)		
	By VISA _____ Mastercard _____		
	Name as appears on card _____		
	Expiry date ____ / ____	Number	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
	Signature _____		
<i>Is another registrant paying for this registration? (Y/N)</i>			
		<i>List name</i>	

Send to Dr Tony Kettle, Oxidants Antioxidants and Nutrition, Free Radical Research Group, Christchurch School of

RESEARCH PROFILE: Dr. Wendy Jessup

Current address: Cell Biology Group, Heart Research Institute, 145 Missenden Road, Camperdown, Sydney, NSW 2050, Australia.

Email: w.jessup@hri.org.au

Research Staff

<u>Postdoctoral</u>	<u>Research Assistants</u>	<u>Postgraduate students</u>
Dr. Anna Baoutina	Ms. Sian Cartland	Ms. Louise Larkin
Dr. Andrew Brown	Ms. Caitlin Delaney	
Dr. Katherina Gaus		
Dr. Paul Wilson		
Dr Carmel Quinn		

Research Interests

Major objectives are to understand the mechanisms by which vascular cells accumulate cholesterol and other lipids, and to determine how this process influences their function, particularly in relation to the development of atherosclerotic lesions. The intent is to understand the 'normal' mechanisms of lipid (particularly sterol) homeostasis and how these are deranged in atherosclerosis. In addition, the impact of the extent, quality and location of lipid storage on cell function is studied. This includes studies of the generation and metabolism of oxidized lipids similar to those present in atherosclerotic lesions

Lipid content of plaque foam cells; generation of in vitro foam cells.

A description of the lipid content of plaque and more particularly, of plaque foam cells is an essential prerequisite for understanding the mechanisms of such atherosclerotic lipid accumulation and their impact on vascular cell function. We have measured the oxysterol content of human atherosclerotic plaque, demonstrating the presence of significant amounts of several oxysterols of both enzymic and non-enzymic origin. In collaboration with the Biochemistry Group we have also measured oxidised cholesteryl esters in human lesions and in lipoproteins isolated from such lesions.

The isolation of macrophage foam cells from human plaque was achieved in collaboration with Drs. L. Mattsson-Hülten and Olov Wiklund (University of Göteborg). We have determined the oxysterol content of such foam cells, demonstrating that the levels of oxysterols, when expressed per cholesterol, are significantly higher (approx ten-fold) that in isolates of whole plaque, suggesting that they are either generated intracellularly or preferentially accumulate there.

Comparable measurements of the oxysterol content of commonly used macrophage model foam cells (generated by uptake of OxLDL) have shown that the oxysterol content of such cells is much greater than observed in vivo. We have therefore developed a human foam cell model that more closely resembles its in vivo counterpart, in which human monocyte-derived macrophages are loaded with non-oxidised LDL selectively enriched with specific oxysterols. These model foam cells are now in use in related studies.

Metabolism of oxidized LDL.

Cholesterol- and cholesteryl ester-rich macrophage foam cells, characteristic of atherosclerotic lesions, are often generated *in vitro* using oxidized low-density lipoprotein (OxLDL). However, relatively little is known about the nature and extent of sterol deposition in these cells, nor of its relationship to the foam cells formed in atherosclerotic lesions. We have examined the content and cellular processing of sterols in OxLDL-loaded macrophages, and compared this with macrophages loaded with acetylated LDL (AcLDL: cholesteryl ester-loaded cells containing no oxidized lipids) or 7-ketocholesterol-enriched

ketocholesterol (7KC), the major oxysterol present in OxLDL). OxLDL-loaded macrophages differ in several respects from other model foam cells; perhaps most significantly they contained large (~40-50% total cell sterol content) pools of oxidized esters, containing cholesterol or oxysterols esterified to oxidized fatty acids. These are very stable and located in lysosomes, indicating resistance to lysosomal esterases. In collaboration with Dr. Len Kritharides (Clinical Biochemistry Group) we have also found that lightly oxidized LDL can inactivate acid lipases, also leading to lysosomal accumulation of endocytosed lipoproteins. The presence of similar deposits in atherosclerotic lesion foam cells would represent a pool of sterols which is particularly resistant to removal.

Cholesterol homeostasis in macrophage foam cells: influence of oxysterols

We have found that macrophage foam cells loaded with oxidised LDL export cholesterol less readily to an extracellular acceptor, apolipoprotein A-1 (apo A-1) than cells comparably loaded with acetylated LDL (AcLDL), in which cholesterol is the only sterol accumulated. We hypothesised that the presence of cellular oxidised cholesterol, specifically 7KC, may be involved in this inhibition. Specific enrichment of macrophage foam cells with 7KC, by incubation with 7KC-enriched acetylated LDL (7kAcLDL), led to a similar inhibition of cholesterol efflux. Thus oxysterols which are present in foam cells may contribute to generation and maintenance of the foam cell phenotype by interfering with their capacity to dispose of excess cholesterol. The levels of 7KC able to inhibit cholesterol export from macrophage foam cells were similar to those measured in plaque foam cells. Recent studies have addressed the mechanism of 7KC-mediated inhibition of cholesterol efflux.

Oxysterol metabolism

The presence of oxysterols in atherosclerotic plaque and the potent biological activity shown by some of them has prompted our interest in their source and metabolism at the cellular and organismal level. Circulating 7KC is rapidly cleared and metabolised to water soluble products secreted in the bile, suggesting that oxysterols present in plaque are most likely generated locally rather than derived from dietary sources. We are currently investigating the pathways for 7KC metabolism and the influence of 7KC on a major pathway (sterol 27-hydroxylase) for cholesterol clearance.

Cell-mediated pro-and anti-oxidant effects on LDL oxidation

An ongoing major interest is in the mechanisms by which cells, particularly macrophages, promote lipoprotein oxidation. Oxidised lipids are present in atherosclerotic lesions and are almost certainly generated locally, mediated by the cells of the intima. An understanding of how cell-mediated lipoprotein oxidation occurs is a necessary prerequisite to the development of strategies for its prevention.

We have investigated the role of cell-derived reactive oxygen and nitrogen species to influence cell-mediated oxidation, showing that (a) cell-derived superoxide radicals do not stimulate LDL oxidation; (b) induction of nitric oxide synthesis in murine macrophages by -IFN and LPS leads to a very profound suppression of their ability to oxidize LDL. Supplementation of macrophages with tocopherol, even at very high levels, has no impact on their ability to oxidise LDL *in vitro*.

Cell-mediated oxidation is absolutely dependent on the presence of trace amounts of redox-active metals and follows essentially the same pattern (in terms of product formation) as cell-free metal-mediated LDL oxidation. One contributing mechanism in cell-mediated lipid oxidation may be the ability of macrophages to reduce transition metals. Reduced metals such as Fe(II) or Cu(I) rapidly react with lipid hydroperoxides leading to the formation of reactive lipid radicals and conversion of the reduced metal to its oxidised form. We have demonstrated the ability of macrophages to reduce extracellular Fe and Cu and identified a contributing mechanism (direct trans-plasma membrane electron transport). These studies have identified a novel mechanism that may contribute to macrophage-mediated LDL oxidation and may also reveal potential new strategies for the inhibition of this process.

Macrophages may also inhibit LDL oxidation by sequestration of copper and iron. Also, under metal-

Collaborations.

Many of the above projects are in collaboration with Prof Roger Dean (co-Leader of the Cell Biology Group). A number of cell-based projects are performed in collaboration with the Clinical Research Group headed by Dr. Len Kritharides. These include studies of cholesterol efflux mechanisms, the generation of human macrophage foam cell models and regulation of expression of apoE by macrophages. This is reflected in current and ongoing project grants jointly held between the groups.

We also collaborate in several projects led by Dr. David Celermajer (Clinical Research Group), in which both clinical and cellular studies of vascular cell function have been studied. These have included studies of endothelial cell adhesion molecule expression and monocyte adhesion in response to a number of defined modulators, including arginine availability and sex hormone exposure. More recently we have applied measures of cholesterol homeostasis in our model human macrophage foam cells.

Collaborations outside HRI include studies with: Prof. John Hamilton (Melbourne University) on the mechanisms by which oxidized lipoproteins stimulate macrophage proliferation; Dr. Carol Pollock (University of Sydney) on lipoprotein interactions with renal epithelia; Dr. Kerry-Anne Rye (University of Adelaide) on interactions of apolipoproteins with macrophage foam cells.

Recent publications.

McCrohon, J.A., W. Jessup, D.J. Handelsman, D.S. Celermajer. (1999). Androgen exposure increases human monocyte adhesion to vascular endothelium and endothelial cell expression of vascular cell adhesion molecule-1. *Circulation* 99: 2317-2322.

McCrohon, J.A., S. Nakhla, W. Jessup, K.K. Stanley, D.S. Celermajer. (1999). Estrogen and progesterone reduce lipid accumulation in human monocyte-derived macrophages: a sex-specific effect. *Circulation* 100: 2319-2325.

Gelissen, I.C., K.A. Rye, A.J. Brown, R.T. Dean, W. Jessup. (1999). Oxysterol efflux from macrophage foam cells: the essential role of acceptor phospholipid. *J Lipid Res* 40: 1636-1646.

Brown, A.J., W. Jessup. (1999). Oxysterols and atherosclerosis. *Atherosclerosis* 142: 1-28.

van Reyk, D.M., W. Jessup, R.T. Dean. (1999). Prooxidant and antioxidant activities of macrophages in metal-mediated LDL oxidation: the importance of metal sequestration. *Arterioscler Thromb Vasc Biol* 19: 1119-1124.

van Reyk, D.M., W. Jessup. (1999). The macrophage in atherosclerosis: modulation of cell function by sterols. *J Leukoc Biol* 66: 557-561.

Rees, D., T. Sloane, W. Jessup, R.T. Dean, L. Kritharides. (1999). Apolipoprotein A-I stimulates secretion of apolipoprotein E by foam cell macrophages. *J Biol Chem* 274: 27925-27933.

Hamilton, J.A., D. Myers, W. Jessup, F. Cochrane, R. Byrne, G. Whitty, S. Moss. (1999). Oxidized LDL can induce macrophage survival, DNA synthesis, and enhanced proliferative response to CSF-1 and GM-CSF. *Arterioscler Thromb Vasc Biol* 19: 98-105.

Brown, A.J., E.L. Mander, I.C. Gelissen, L. Kritharides, R.T. Dean, W. Jessup. (2000). Cholesterol and oxysterol metabolism and subcellular distribution in macrophage foam cells. Accumulation of oxidized esters in lysosomes. *J Lipid Res* 41: 226-237.

Baoutina, A., R.T. Dean, W. Jessup. (2000). Macrophages can decrease the level of cholesteryl ester hydroperoxides in low density lipoprotein. *J Biol Chem* 275: 1635-1644.

McCrohon, J.A., A.K. Death, S. Nakhla, W. Jessup, D.J. Handelsman, K.K. Stanley, D.S. Celermajer. (2000). Androgen receptor expression is greater in macrophages from male than from female donors. A sex difference with implications for atherogenesis. *Circulation* 101: 224-226.

Brown, A.J., G.F. Watts, J.R. Burnett, R.T. Dean, W. Jessup. (2000). Sterol 27-hydroxylase acts on 7-ketocholesterol in human atherosclerotic lesions and macrophages in culture. *J Biol Chem* 275: 27627.

Conference Travel Grants

- Travel grants will be provided each year on a competitive basis to the total value of A\$2000 for attendance at an international meeting related to free radical research within the same year. All financial members of SFRR (A) are eligible to apply and we welcome applications from Australia and New Zealand.
- Funds are available to those researchers aged 35 or less, except where a special case can be made to the Executive. Deadlines for applications are 1 January and 1 July of each year for meetings in the following 6 months. A nominated committee reviews all applications. Previous awardee winners should not reapply.

To apply submit a copy of the abstract for the conference to be attended, a Curriculum Vitae including a full list of publications, and two reprints to: Dr Roland Stocker, Secretary, Sydney Free Radical Group Inc., The Heart Research Institute, 145 Missenden Road, Camperdown, NSW 2050, AUSTRALIA

Collaborative Study Grants

SFRG, Inc. also provides support for collaborative studies in an overseas research laboratory for periods up to 3 months.

The deadlines are as for the Conference Travel Grants. Applications must include a brief outline of and justification for the proposed research, a letter of support from the host laboratory, as well as a full CV of the applicant. Please submit applications to the Secretary, SFRG.

Treasurers' Report: Mike Murphy

The current Membership fee (payable to Society for Free Radical Research Australasia) is NZ\$35 or Aus\$30 for full members and NZ\$17 and Aus\$15 for students. As a small society we very much depend on the enthusiasm of individual members to increase awareness of the society, its activities and the advantages of membership to both ISFRR and SFRR(A). Overdue membership fees should be paid as soon as possible to aid covering the costs of activities of the society. Past members who are not currently financial members of SFRR(A) are urged to rejoin the society by submitting their renewal forms (see attached form in this Newsletter) to the Treasurer ASAP. Disregard the form if you have already paid the 2000 membership dues.

The following is a summary of the financial status of the Australasia Branch of SFRR and covers membership for the years 1999-2000.

SFRR (Australasia) Treasurer's report (17/10/00)

Opening Balance	7,345.58	(Bank statement 20/3/00)
Income:		
From SFRR Dunedin meeting	3,000.00	
From SFRR Sydney meeting	11,084.09	
Subscriptions	980.40	
Interest	234.56	
	<hr/>	

Expenditure

Travel award to Dr Hawkins	1,505.00
SFRR (Aus) meeting 2000	1,005.00
Resident withholding tax	90.26
Bank fees	<u>0.25</u>
	2,600.51

Current balance**NZ\$20,044.12**

(Bank statement 20/9/00)

Membership 2000 (25/9/00)	1999	1998	1997
Full 27	60	63	48
Student 3	14	11	8
Total 30	74	74	56

Comments

Membership numbers are stable and the financial position is good. NZ\$3,000 from the SFRR(Aus) 1998 meeting in Dunedin and repayment of the loan (~Aus\$2,000) and profit (~ Aus\$ 6,900) from the SFRR(Aus) 1999 meeting in Sydney were paid into the society's account. Many subscriptions for 2000 are still outstanding and should be paid as soon as possible. The current 2000 membership form is attached to this document at the final page.

Mike Murphy
Treasurer
SFRR(Australasia)
17/10/00

Radicals on the Web!

Several SFRR members have approached the Executive Committee asking about the availability of on-line information on free radical research and up coming events. One point of entry is the WEB site for the Australasia Branch of the Society of Free Radical Research (<http://www.med.su.oz.au/path/society2.htm>). The Executive offer their congratulations to Professor Nick Hunt and his team (Web Page by J. Maitland and maintained by G. Holden) for maintaining this excellent site. The web-site also offers links to established Institutes in the Australasia region as well as other informative links. The current issue of the Newsletter is also available on-line at this site so you can catch up on articles that you missed in most recent issue.

SFRR(A) membership forms are also available at the web-site and the Executive encourages researchers in the field of free radicals to consider joining the SFRR(A).

As mentioned above, the SFRR(A) site has numerous and relevant links to other web-sites including our parent International SFRR (<http://www.mcw.ed/biophys.isfrf>) as well as those other sites related to free radical research in biology and medicine. The Australasia branch web-site was created to fill the need for our branch to move into a more accessible electronic media and is maintained regularly to ensure that information is constantly up-to-date.

For Your Diary

- 2000 -

November 16-20. 7th Annual Meeting of The Oxygen Society, Paradise Point Resort, San Diego, California USA. Registration abstract submission forms will be mailed in April 2000 to all persons on The Oxygen Society mailing list. If you are not a member and wish to receive this information via mail, please forward full address information to info@oxygensociety.org/ or on-line at website.<http://www.oxygensociety.org/>

November 30. December 2, 2000. SFRR-Europe Winter Meeting II nd International Meeting on "Oxidative Stress: Biochemistry and Pathophysiology". Valencia (Spain). Organized by Francisco J. Romero, Jos? C. Fern?ndez-Checa, Lester Packer & Giuseppe Poli. For more information contact: Francisco J. Romero, Dept.Physiology, School of Medicine & Dentistry, University of Valencia, Av. Blasco Ibañez, 17. 46010-Valencia, Spain. TEL: +34-96-3864646; FAX:+34-96-3864642; E-MAIL: fco.romero@uv.es. For more detailed information on the conference contact the web-site shown: <http://infomedic.fmedic.uv.es/congreso/sfrr2000/SFRRE2000.html>

- 2001 -

March 18-23, 2001. Gordon Conference on Oxidative stress and Disease. Ventura, California. Full program for the meeting can be seen at the Gordon conference web site: <http://www.grc.uri.edu/programs/2001/oxid.htm> as well as the online application form at <http://www.grc.uri.edu/apply1.htm>. Contact - Simon Melov Ph.D., Buck Institute for Age Research, Phone: 415-899-1800; Fax: 415 209 2232, email: smelov@buckinstitute.org

March 25-30, 2001. The Mid-Eastern Regional Series of Meetings on Medical Sciences:The Roles of Free Radicals in Health and Disease; II: Cell Signaling, RONS Damage in Physiology, Pathology and Aging; Jerusalem and Bethlehem Organized by: Mottie Chevion and Angelo Azzi. Special Event: March 27, 2001-Honoring Earl R. Stadtman and Thressa C. Stadtman Contact: Dr. Mottie Chevion, The Ganz Chair of Heart Studies, The Hebrew University-Hadassah Schools of Medicine and Dental Medicine, P.O. Box 12272, Jerusalem IL-91120, ISRAEL; Tel: +972-2-675-8160/58; Fax: +972-2-641-5848/678; Conference Secretariat: Free Radicals Meeting, P.O.Box 50006, Tel Aviv 61500, Israel; Tel: +972-3-514-0014; Fax: +972-3-514-0077; Email: radicals@kenes.com; Website: www.kenes.com/radical

April 2-5, 2001. Second International Conference on Oxidative Stress & Aging: Diagnostics & Therapeutics Royal Lahaina Resort, Maui. For further information, visit www.o2sa.org contact the meeting secretariat at (925/472-5900) via e-mail at klindeman@hp-assoc.com.

May 16-19, 2001. Diet and Optimum Health. Marriott Hotel, Portland, Oregon, USA. This conference is organized by the Linus Pauling Institute at OregonState University to commemorate the 100th anniversary of Linus Pauling's birth. Scientific and public sessions will explore the roles of micronutrients, vitamins and phytochemicals in cancer, heart disease, neurodegenerative disorders and aging. For more information, contact: Balz Frei, Linus Pauling Institute, Oregon State University, Corvallis, OR 97331-6512, USA. TEL: +1 541 737-5075; FAX +1 541 737-5077; E-MAIL: balz.frei@orst.edu; WEBSITE: www.osu.orst.edu/dept/lpi.

June 4-7, 2001. Second International Symposium on Natural Antioxidants: Molecular Biological Action Beijing, China Corresponding Organizer:Bao-Lu Zhao Academia Sinica 15 Datun Road Chaoyang District Beijing, 199191, China; Tel 8610-64888576; Fax 8610-64877837; E-mail xinzhsc@sun5.ibp.ac.cn

8 – 12 July 2001. 9th International Congress of Toxicology ICT-IX, , Brisbane AUSTRALIA. Registration Brochure and Call for Abstracts is available on the Congress website, www.uq.edu.au/ICT9/. Alternatively, a hard copy of the Registration Brochure and Call for Abstracts may be obtained from the Conference Secretariat: ICT9 Congress C/- Intermedia P.O. Box 1280 Milton, QLD 4064. The closing date for abstract submission is February 5, 2001. Tele 07-3858 5496; Fax 07-3858 5511; E-mail ictix2001@im.com.au

September 16-19, 2001. The Third International Conference on Oxygen/Nitrogen Radicals: Cell Injury and Disease Morgantown, West Virginia, USA This conference will bring together prominent investigators to present current research on the role of reactive oxygen/nitrogen species in the areas of cellular and molecular mechanisms of disease processes. For more information contact: Val Vallyathan, TEL: 1-304-285-5770, FAX: 1-304-285-5938, E-MAIL:vav1@cdc.gov

November 15-19, 2001. 8th Annual Meeting of The Oxygen Society Sheraton Imperial Hotel and Convention Center Research Triangle Park, North Carolina, USA. For further information, contact The Oxygen Society at info@oxygensociety.org or via phone at (925) 472-5900.

July 17-21, 2002. XIth Biennial Meeting of the International Society for Free Radical Research Paris, France Contact: Catherine Pasquier Tel 33 01 44 85 62 11 Fax 33 0144 85 62 07 E-mail pasquier@bichat.inserm.fr

Society for Free Radical Research (Australasia)
2000 MEMBERSHIP APPLICATION/RENEWAL FORM: (Due date 31 July 2000)

Title: _____ **Name:** _____

Address: _____

Phone: _____ **Fax:** _____

e-mail: _____

Research Interests (short description for the 2000 membership directory):

Annual Fees:

Full Membership Aus\$30 / NZ\$35 Student Membership Aus\$15 / NZ\$17

Please tick the appropriate box above and send a cheque payable to "Society for Free Radical Research (Australasia)" in either Australian or New Zealand dollars to:

Dr Mike Murphy, Treasurer, SFRR (Australasia)
Biochemistry Department
University of Otago
PO Box 56, Dunedin
NEW ZEALAND

Signature: _____

Date: _____

(Student membership only - ask your supervisor to complete the declaration below)

I confirm that the above applicant is at present a student under my supervision.

Name:

Signature:

Institution:

Date:
