

Curriculum Vitae



Dr Garwin Kim Sing

Associate Professor of Immunology/Microbiology

Education:

Postgrad. Dip. Ed.	2010	Queensland Institute of Technology, Australia
Postdoctoral Training	1985	National Cancer Institute, USA
PhD	1984	University of the Witwatersrand, South Africa
BSc	1974	University of Cape Town, South Africa

Awards and Honours:

- Poliomyelitis Foundation PhD Scholar
- CSIR Postdoctoral Fellowship
- Fogarty International Postdoctoral Fellowship
- Viertel Foundation Award
- Best Poster Award – Texas UK Collaborative Bioscientific Program, London, UK
- Visiting Scientist, Rijeka Medical School, Croatia.

Appointments:

- Research Officer, University of the Witwatersrand, South Africa. 1976
- Fogarty Visiting Fellow, National Cancer Institute, Maryland, USA. 1985

- Senior Research Officer, Queensland Institute for Medical Research, Brisbane, Australia. 1989
- Senior Research Fellow, University of Edinburgh, United Kingdom. 2001
- Visiting Fellow, Queensland Institute for Medical Research, Brisbane, Australia. 2011
- Associate Professor, Alfaisal University, Saudi Arabia. 2012 – present.

Research Interests:

- The immunopathology of acute and chronic virus-host interactions (cytomegalovirus, hepatitis B virus, human immunodeficiency virus) in the context of cytokine production, cytotoxic and regulatory T lymphocytes and macrophages.
- The role of cytokines in blood cell development.
- The effects of Interferon gamma on lipid metabolism in the macrophage.
- The biology and function of neutrophils in cystic fibrosis.

Teaching:

- University of the Witwatersrand, Johannesburg, South Africa. (1981 – 1984). Undergraduate Program.
 - Immunology
- University of Queensland, Brisbane, Australia (1989 – 2001). Undergraduate Program
 - Virology
- University of Queensland, Brisbane, Australia (1989 – 2001). Postgraduate Program
 - Supervisor and examiner of Honours, Masters and PhD students.
- Griffiths University, Brisbane, Australia (1989 – 2001). Postgraduate Program.
 - Supervisor of Honours, Masters and PhD students
- Griffiths University, Brisbane, Australia (1998 – 2001). Undergraduate Program.
 - Medical Microbiology.
- University of Edinburgh, Scotland, United Kingdom. (2001-2009).
 - Guest lectures to undergraduates in Virology. Supervision of PhD students.

- Postgraduate Diploma in High School Education, Queensland Institute of Technology, Brisbane, Australia, 2010.
- Alfaisal University, Riyadh, Kingdom of Saudi Arabia (2012-present). Associate Professor in Microbiology and Immunology, College of Medicine.

Grants:

- 1990 – 2000 NH&MRC Australian Program Grant: Iron metabolism and Liver Disease
- 1998 – 1999 Viertal Foundation: Chronic Hepatitis B virus Infection
- 2013 Alfaisal Internal Research Grant

TECHNICAL EXPERTISE

Tissue culture:

Establishment and maintenance of primary and organ cell lines, cell cloning, leukocyte separation, bone marrow colony assays, mammalian cell transfections, growth factor assays, cell proliferation assays.

Microscopy:

Maintenance and operation of bright-field, phase-contrast and confocal microscopes. Thin-sectioning for electron microscopy and operation of electron microscopes. Fixation and staining of tissue specimens.

FACS

Operation of FACS Calibar , FACS Vantage and FACS Fortessa systems.

Virology:

CMV, vaccinia, HIV, HBV, HCV, plaque titration, purification (column chromatography, density gradient centrifugation), detection (immunohistochemistry, transmission electron microscopy, FACS, ELISA)

Immunology:

Proliferation and cytotoxicity T cell assays, ELISPOT, antibody purification

Protein:

ELISA, solid-phase chromatography, gradient centrifugation, Western blotting, 2D gel electrophoresis, immunoprecipitation, protein purification

Nucleic acid:

DNA and RNA extraction, Southern and Northern blotting, PCR, sequencing, bacterial transformation, plasmid purification, fermentation culture, cloning, promoter/enhancer reporter gene assays (SEAP, GFP), transfections, *in situ* hybridisation, gene expression, microarray platforms, siRNA knockdowns

Computing:

Word, Excel, Coreldraw, Photoshop, Sigmaplot, Statistica, Access, Refmanager, Javascript, HTML, NetObjects Fusion, Powerpoint, Bioedit, Genespring

Additional Training:

Animal welfare and handling, Good Laboratory Practice (GLP) management, Health and Safety Certification.

BIBLIOGRAPHY

Original Articles:

1. **Kim Sing G**, Garnett HM: Immunoperoxidase detection of human cytomegalovirus antigens in peripheral blood lymphocytes. **Proc. Electron Microscope Soc. of South Africa** 10:125-126, 1980.
2. **Kim Sing G.** and Garnett HM: Decreased expression of receptors on monocytes from cancer patients. **South African Medical Journal** 59: 676-677, 1981.
3. **Kim Sing G.** and Garnett HM.: The effects of human cytomegalovirus challenge in vitro on subpopulations of peripheral T lymphocytes. **J. Med. Virology** 14: 363-371, 1984.
4. Keller JR, Mantel C, **Sing GK**, Ellingsworth LR, Ruscetti SK, Ruscetti FW: Transforming growth factor β 1 selectively regulates early murine hematopoietic progenitors and inhibits the growth of IL-3-dependent myeloid leukemic cell lines. **J. Exp. Med.**, 168:737-750, 1988.
5. **Sing GK**, Keller JR, Ellingsworth LR, Ruscetti FW: Transforming growth factor- β 1 enhances the suppression of human hematopoiesis by tumor necrosis factor- α or recombinant interferon- γ . **J. Cell. Biochem.**, 39:107-116, 1988.
6. **Sing GK**, Keller JR, Ellingsworth LR, Ruscetti FW: Transforming growth factor- β selectively inhibits normal and leukemic human bone marrow cell growth *in vitro*. **Blood**, 72:1504-1511, 1988.
7. Keller JR, **Sing GK**, Ellingsworth LR, Ruscetti FW: Transforming growth factor- β : Possible roles in the regulation of normal and leukemic hematopoietic cell growth. **J. Cell. Biochem.**, 39:175-184, 1989.
8. Ruscetti FW, **Sing GK**, Burke P, Bettens F, Schlick E, Ruscetti SK, Keller JR: Role of biologic response modifiers in the growth and differentiation of myeloid leukemic cells. **Current Topics in Microbiol. and Immunol.** 149:165-172, 1989.
9. **Sing GK**, Ruscetti FW: Preferential suppression of myelopoiesis in normal marrow cells after *in vitro* challenge with human cytomegalovirus: **Blood**, 75:1965-1973, 1990.

10. Keller JR, McNiece IK, Sill KT, Ellingsworth LR, Quesenbery PJ, **Sing GK**, Ruscetti FW: Transforming growth factor-B directly regulates primitive murine hematopoietic cell proliferation. **Blood** 75:596-602, 1990
11. Keller JR, **Sing GK**, Ellingsworth LR, Ruscetti SK, Ruscetti FW: Two forms of transforming growth factor- β are equally potent selective growth inhibitors of early murine hematopoiesis. **Ann. N.Y. Acad. Sci.**, 593:172-180, 1990.
12. Steis RG, Vandermolten LA, Lawrence J, **Sing G**, Ruscetti F, Smith JW, Urba WJ, Clark J, Longo DL: Erythrocytosis in hairy cell leukemia following therapy with interferon alpha. **Br. J. Haematol.** 75:133-135, 1990.
13. **Sing GK**, Ruscetti F, Beckwith M, Ellingsworth L, Urba W, Longo DL: Growth inhibition of a human lymphoma cell line: Induction of a transforming growth factor- β 1 mediated autocrine negative loop by phorbol myristate acetate. **Growth Cell Differen.** 1:549-556, 1990.
14. Ruscetti FW, DuBois C, Falk L, Sven E, **Sing GK**, Longo DL, Wiltrout R, Keller JR: Clinical applications of TGF- β . **Ciba Foundation Symposium** #157:57-61, Wiley Press, Chichester. 1990.
15. **Sing GK**, Prior S, Fernan A, Cooksley WGE: Hepatitis B virus differentially suppresses myelopoiesis and displays tropism for immature haematopoietic cells. **J Virol** 67:3454-3460, 1993.
16. Chai T, Prior S, Cooksley WGE, **Sing GK**: Infection of human bone marrow stromal cells by hepatitis B virus: Implications for viral persistence and the suppression of haematopoiesis. **J. Infect. Dis.** 169:871-874, 1994.
17. **Sing GK**, Prior S, Pace R, Scott J, Shield P, Searle J, Harmon B, Martin N, Powell L, Cooksley WGE: Establishment of a cell line from a hepatocellular carcinoma of a patient with haemochromatosis. **Hepatology.** 20:74-81, 1994.
18. Beckwith M, Ruscetti FW, **Sing GK**, Urba WJ, Longo DL.: Anti-IgM induces transforming growth factor- β sensitivity in a human B-lymphoma cell line: Inhibition of growth is associated with a downregulation of mutant p53. **Blood** 85:2461-2470, 1995.
19. **Sing G**, Butterworth L, Chen X, Bryant A and Cooksley G. Composition of peripheral blood lymphocyte populations during different stages of chronic infection with hepatitis B virus. **J. Viral Hepat.** 5:83-93, 1998.
20. Chen X, Cooksley G and **Sing G**. Distinct patterns of T cell receptor distribution of peripheral blood CD8+ cells during different stages of chronic infection with hepatitis B virus. **Human Immunol.** 59:199-211, 1998.

21. **Sing G.K.**, Ladhams A, Arnold SA, Parmar H, Chen X, Cooper J, Butterworth L, Stuart K, D'Arcy D and Cooksley WGE. A longitudinal analysis of cytotoxic T lymphocyte precursor frequencies to the hepatitis B virus in chronically infected patients. **J. Viral Hepat.** 8:19-29, 2001.
22. **Sing GK**, Li D, Chen X, Macnaughton T, Liechanska A, Butterworth L, Ladhams A and Cooksley WGE. A Molecular Comparison of T-Cell Receptor Repertoires Between the T Lymphocytes Infiltrating the Liver and Circulating in the Peripheral Blood of Patients With Chronic Hepatitis B. **Hepatology.** 33:1288-1298, 2001.
23. Ladhams A, Schmidt C, **Sing G**, Butterworth L, Fielding G, Tesar P, Strong R, Leggett B, Powell L, Maddern G, Ellem K, Cooksley G. Treatment of non-resectable hepatocellular carcinoma with autologous tumor-pulsed dendritic cells. *J. Gastroenterol. Hepatol.* 17:889-896, 2002.
24. Grimes GR, Moodie S, Beattie JS, Craigon M, Dickinson P, Forster T, Livingston AD, Mewissen M, Robertson KA, Ross AJ, **Sing G**, Ghazal P. GPX-Macrophage Expression Atlas: a database for expression profiles of macrophages challenged with a variety of pro-inflammatory, anti-inflammatory, benign and pathogen insults. *BMC Genomics.* 12;6:178, 2005
25. Chowdhury MH, Campbell CJ, Theofanidou E, Lee SJ, Baldwin A, **Sing G**, Yeh AT, Crain J, Ghazal, Coté GL. Surface enhanced Raman spectroscopy (SERS) for the detection of intracellular constituents using gold nanoshells. *Proc. SPIE* 6099:609905-1, 2006.
26. Cheung GY, Dickinson P, **Sing G**, Craigon M, Ghazal P, Parton R, Coote JG. Transcriptional responses of murine macrophages to the adenylate cyclase toxin of *Bordetella pertussis*. *Microb Pathog.* 44:61-70, 2008.
27. Ruscetti FW, Dubois C, Falk LA, Jacobsen SE, **Sing G**, Longo DL, Wiltrout RH, Keller JR. In vivo and in vitro effects of TGF- β 1. *Clinical Applications of TGF* **738**:212, 2008.
28. Lacaze P, Raza S, **Sing G**, Page D, Forster T, Storm P, Craigon M, Awad T, Ghazal P, Freeman TC. Combined genome-wide expression profiling and targeted RNA interference in primary mouse macrophages reveals perturbation of transcriptional networks associated with interferon signaling. *BMC Genomics* 10:372-379, 2009
29. Blanc M, Hsieh W, Robertson KA, Watterson, S, Shui G, Lacaze P, Khondoker M, Dickinson P, **Sing G**, Rodriguez-Martin S, Phelan P, Forster T, Strobl B, Müller M, Riemersma R, Osborne T, Wenk MR, Angulo A, Ghazal P. Host defense against viral infection involves interferon mediated down-regulation of sterol biosynthesis. *PLoS Biol.* 9:e1000598. 2011
30. Kropp KA, Robertson KA, **Sing G**, Rodriguez-Martin S, Blanc M, Lacaze P, Noor Hassim MFB, Khondoker MR, Busche A, Dickinson P, Forster T, Strobl B, Mueller M, Jonjic S, Angulo A, Ghazal P. J. Viro. I Reversible inhibition of murine cytomegalovirus replication by gamma interferon (IFN- γ) in primary macrophages involves a primed type I IFN-signaling subnetwork for full establishment of an immediate-early antiviral state. *J Virol.* 85:10286-99, 2011

31. Gibbs HC, **Sing G**, Gonzalez Armas J-C, Campbell C, Ghazal P, Yeh AT. Time-lapse ultrashort pulse microscopy of infection in three-dimensional versus two-dimensional culture environments reveals enhanced extra-chromosomal virus replication compartment function. *J. Biomed. Optics* 18: (031111-1)-6, 2013.

Chapters in Books:

1. **Kim Sing G**, and Garnett HM: The detection of human cytomegalovirus antigens in mitogen-stimulated peripheral blood lymphocytes. In Plotkin SA , Michelson S, Pagano JS, Rapp F (eds): "**CMV: Pathogenesis and Prevention of Human Infections**", (Birth Defects:Original Article Ser. Vol. 20, 984). Publ. AR Liss, Inc. pp 234-235.
2. Ruscetti FW, **Sing GK**, Ellingsworth LR, Ruscetti S, Keller JR: Transforming growth factor- β : A selective growth inhibitor for hematopoietic progenitor cells. *In*: "**Monokines and Other Non-Lymphocytic Cytokines**", M.C. Powanda, J.J. Oppenheim, M.J. Kluger, C.A. Dinarello, eds., A.R. Liss publ., pp 307-312, 1988.
3. Ruscetti FW, **Sing GK**, Ellingsworth LR, Keller JR: "Transforming Growth Factor- β : A Negative Regulator of Normal and Leukemic Hematopoietic Progenitor Cell Growth." *in* **Exp. Haematol. Today**, ed. S.J. Baum, K. Dicke, E. Lotzova, D.H. Pluznick, Springer Verlag publ., pp 119-124, 1988.
4. **Sing GK**, Ruscetti FW: Cytomegalovirus and haematological disease. in N. Young (ed) "Viruses as Agents of Haematological Disease", **Bailliere's Clinical Haematology**, 8:149-163, 1995.
5. **Sing GK**, Prior S, Cooksley WGE. An in vitro model for latency and reactivation of hepatitis B virus in leukocytes. in "**Viral Hepatitis and Liver Disease**", M. Rizzetto, R.H. Purcell, J.L.Gerin, G. Verme eds., Publ. Minerva Medica, Turin. pp 446-452, 1997.
6. Ellem KAO, Schmidt CW, O'Rourke MGE, Li C-L, **Sing G**, Macdonald G, Misko I and Kelso A. The labyrinthine ways of cancer immunotherapy - T cell, tumour encounter: "How do I lose thee? Let me count the ways". **Adv. Cancer Res.**, 75:204-242, 1998.