

CURRICULUM VITAE

RAKESH K SINGH

Division of Women's oncology, and,
Molecular Therapeutics Laboratory,
Kilguss Research Institute, Women and Infant's Hospital
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EDUCATION

Undergraduate	Delhi University, India; Chemistry, Industrial Chemistry, B.Sc. 5/1988.
Medical School.	N/A.
Other Advanced Degrees	Purvanchal University, India; Chemistry, M.Sc. 1/1993.
MPhil.	Birla Institute of Technology and Science (BITS), Pilani, India; Chemistry; 7/1996.
PhD.	Jamia Millia Islamia University, New Delhi, India; Chemistry; 1/2003.

POSTGRADUATE TRAINING

Residency	N/A
Fellowship	Women and Infants' Hospital of R.I., 101- Dudley Street, Providence, RI, 02903, Postdoctoral Fellow; Cancer Drug Discovery Research; 5/2005-7/2006

POSTGRADUATE HONORS AND AWARDS

1. Senior Research Fellowship, Council of Scientific and Industrial Research (CSIR), India; 1/1997-12/1998.
2. Ranbaxy Research Fellowship, Ranbaxy Research laboratories, India; 1/1999-12/2001.

MILITARY SERVICE N/A

PROFESSIONAL LICENSES AND BOARD CERTIFICATION

N/A

ACADEMIC APPOINTMENTS

Associate Research Scientist 7/2006-6/2011 Women and Infants' Hospital,
Providence, RI, 02903;
Assistant Professor 7/2011-present Alpert Medical School, Brown University,
Providence, RI. USA

HOSPITAL APPOINTMENTS

Associate Research Scientist 7/2006-6/2011 Women and Infants' Hospital, Providence,
RI, 02903;
Assistant Professor 7/2011-present Women and Infants' Hospital of RI,
Alpert Medical School, Brown
University, Providence, RI. USA .

OTHER APPOINTMENTS

Quality Control Chemist Lark Laboratories (India); 1/1993-8/1993.
Research Fellow Diiechi Sankyo Life Science Research (India) Centre,
India (Formerly Ranbaxy Research lab); 7/1996-
12/2002.
Research Associate Diiechi Sankyo Life Science Research (India) Centre,
India (Formerly Ranbaxy Research lab); 1/2003-
6/2003.
Research Scientist Diiechi Sankyo Life Science Research (India) Centre,
India (Formerly Ranbaxy Research lab); 7/1996-
12/2002.

HOSPITAL COMMITTEES

N/A

UNIVERSITY COMMITTEES

N/A

MEMBERSHIP IN SOCIETIES

None

PUBLICATIONS LIST

ORIGINAL PUBLICATIONS IN PEER-REVIEWED JOURNALS (* for corresponding authorship)

1. **Singh RK**, Sinha N, Jain S, Naqvi F, Salman M. and Anand N. Synthesis of optically active α - heterocyclic α -amino acids from activated lactams. Part-1. *Synthesis* 2005;16:2765-2771.

2. **Singh RK**, Sinha N, Jain S, Naqvi F, Anand N. Synthesis of optically active β -heterocyclic β -amino acids from activated lactam. Part-2. *Tetrahedron* 2005 61:8868-8874.
3. Satyan KS, Swamy N, Dizon DS, **Singh RK**, Granai CO, Brard L. Phenethyl isothiocyanate (PEITC) inhibits growth of ovarian cancer cells by inducing apoptosis: role of caspase and MAPK activation. *Gynecol Oncol* 2006;103:261-270.
4. **Singh RK**, Sinha N, Jain S, Naqvi F, Mehta A and Anand N. A general and efficient synthesis of 3,6-diazabicyclo[3.2.1]octanes. *Tetrahedron* 2006; 62:4011-4017.
5. Brard L, Robison K, **Singh RK**, Kim KK, Lange TS A novel non-hypercalcemic vitamin D derivative in the treatment of ovarian cancer. *J Wom Health* 2007; 16:1098-1099.
6. **Singh RK**, Jain S, Sinha N, Mehta A, Naqvi F, Agarwal AK and Anand N. A simple and efficient synthesis of 8-methyl-3, 8-diazabicyclo[3.2.1]octane (azatropane) and 3-substituted azatropanes therefrom using pyroglutamic acid. *Tet Lett* 2007;48:545-548.
7. Lange TS, **Singh RK**^s, Kim KK, Zou Y, Kalkunte SS, Sholler GS, Swamy N, Brard L Anti-proliferative and pro-apoptotic Properties of 3-Bromoacetoxy Calcidiol (B3CD) in High-Risk Neuroblastoma. *Chem Biol Drug Design* 2007; 70:302-310.
8. **Singh RK**, Lange TS, Kim KK, Zou Y, Lieb C, Brard L Effect of Indole Ethyl Isothiocyanates on proliferation, apoptosis and MAPK signaling in neuroblastoma cell lines. *Bioorg Med Chem Lett* 2007;17:5846-5852.
9. Koto K, Brard L, Bosenberg M, **Singh RK**, Kim KK, Scholler GS. RKS-2-62: A novel therapy for medulloblastoma with activity in vitro and in vivo. *Neurooncology* 2008;10: 513-514.
10. **Singh RK**, Lange TS, Kim KK, Singh AP, Vorsa N, Brard L. Isothiocyanate NB7M causes selective cytotoxicity, pro-apoptotic signaling and cell cycle regression in ovarian cancer cells. *Br J Cancer* 2008;99:1823–1831.
11. Lange TS, Kim KK, **Singh RK**, Strongin RM, Mc Court C, Brard L. Iron-Salophene: An organo-metallic compound with selective cytotoxic and anti-proliferative properties in platinum-resistant ovarian cancer cells. *PLOS One* 2008;3;5: e2303.
12. Brard L, **Singh RK**^s, Kim KK, Lange TS, Sholler GS. Induction of Cytotoxicity, Apoptosis and Cell Cycle Arrest by 1-t-Butyl Carbamoyl, 7-Methyl-Indole-3-Ethyl Isothiocyanate (NB7M) in Nervous System Cancer Cells. *Drug Design, Development and Therapy* 2008;2:61-69.
13. **Singh RK**, Lange TS, Kim KK, Singh AP, Hopson R, Vorsa N, Brard L. Synthesis of Bicyclic Aryl Thiazolines with selective anti-proliferative effects on human cancer cell lines. *Lett Org Chem* 2008;5:103-109.
14. Singh RK, Lange TS, Shaw S, **Kim KK**, Brard L. A novel Indole Ethyl Isothiocyanate (7Me-IEITC) with anti-proliferative and pro-apoptotic effects on platinum-resistant ovarian cancer cells. *Gynecol Oncology* 2008;109:240-249.

15. Singh AP, **Singh RK**[§], Kim KK, Kalkunte KS, Vorsa N, Brard L. Cranberry Proanthocyanidines sensitize the ovarian cancer cells to platinum Therapy. *Phytother Res* 2009;23:1066-1074.
16. Lange TS, McCourt C, **Singh RK**, Stuckey AR, Singh AP, Alturk O, Strongin RM, Brard L. Pro-apoptotic and chemotherapeutic properties of Iron-salophene in an ovarian-cancer animal model. *Drug Des Dev Ther* 2009;3:17–26.
17. Lange TS, Stuckey AR, Robison K, Kim KK, **Singh RK**, Baker CA, Brard L. Effect of B3CD, a novel Vitamin D derivative with postulated anti-cancer activity in an ovarian cancer animal model. *Invest New Drugs*. 2010;28:543-553.
18. Lange TS, Zou Y, **Singh RK**, Kim KK, Kristjansdottir K, Saulnier Sholler GL, Brard L. Chemotherapeutic Effect of Calcidiol Derivative B3CD in a Neuroblastoma Xenograft Model. *Chem Biol Drug Des*. 2010 Aug;76(2):164-173.
19. Kim KK, Lange TS, **Singh RK**, Brard L. Lipophilic aroylhydrazone chelator HNTMB and its multiple effects on ovarian cancer cells. *BMC cancer* 2010; 10:72.
20. **Singh RK**, Lange TS, Kim KK. Brard L. RKS262 causes selective cytotoxicity, pro-apoptotic MAPKinase and selective Bcl2 family signaling and cell-cycle regression in ovarian cancer cells. *Invest New Drugs* 2011;29(1):63-72.
21. Stuckey A, Fischer A, Miller DH, Hillenmeyer S, Kim KK, Ritz A, **Singh RK**, Raphael BJ, Brard L and Brodsky AS. Integrated Genomics of Ovarian Xenograft Tumor Progression and Chemotherapy Response. *BMC Cancer* 2011;11:308.
22. **Singh RK**, Dorf L, DeMartino A, Illeye S, Koto KS, Ashikaga T, Kim KK, Sholler GLS, Brard L. (2011). Oral RKS262 Reduces Tumor Burden in a Neuroblastoma (NB) Xenograft Animal Model and Mediates Cytotoxicity through SAPK/JNK and ROS Activation in vitro. *Cancer Biol and Therapy* 2011;11(12):1036-45
23. Koto KS, Lescault P, Brard L, Kim KK, **Singh RK**, Bond J, Illeye S, Slavik MA, Ashikaga T, Sholler GLS (2011). Antitumor and Genomic activity of nifurtimox is enhanced with tetrathiomolybdate in medulloblastoma in vitro. *Int J of Oncology*, 38:1329-1341.
24. Kim KK, **Singh RK**, Brard L, Moore R, Lange TS (2011). Proapptotic and cell cycle regulatory effects of novel Iron-salophenes in childhood neuroblastoma. *Plos-one* 2011;6(4):e19049.
25. Kim KK, Kawar NM, Lange TS, **Singh RK**, Moore RG. Tetrathiomolybdate induces doxorubicin sensitivity in resistant tumor cell lines. *Gynecol Oncol* 2011;122:183-189.
26. Brard L, Lange TS, Robison K, Kim KK, Ara T, McCallum MM, Arnold LA, Moore RG, **Singh RK***. Evaluation of the first Ergocalciferol-derived, non hypercalcemic anti-cancer agent MT19c in ovarian cancer SKOV-3 cell lines. *Gynecol Oncol*. 2011;123:370-378.
27. Kim KK, Singh AP, **Singh RK**, Demartino A, Brard L, Vorsa N, Lange TS, Moore RG. Anti-angiogenic activity of cranberry proanthocyanidins and cytotoxic properties in ovarian cancer cells. *Int J Oncol* 2012;40:227-235.
28. Lange TS, Horan TC, Kim KK, Singh AP, Vorsa N, Brard L, Moore RG, **Singh RK***. Cytotoxic properties of adamantyl isothiocyanate and potential in vivo

- metabolite adamantyl-N-acetylcystein in gynecological cancer cells. *Chem Biol Drug Des.* 2012;79:92-103.
29. Moore RG, Lange TS, Robinson K, Kim KK, Uzun A, Horan TC, Kawar Nada, Yano N, Chu SR, Mao Q, Brard L, DePaepe ME., Padbury JF, Arnold LA, Brodsky A, Shen Tun-Li, **Singh RK***. Efficacy of a non-hypercalcemic vitamin-D2 derived anti-cancer agent (MT19c) and inhibition of fatty acid synthesis in an ovarian cancer xenograft model. *PLoS ONE* 7(4): e34443.

PATENTS:

1. Palle VP, Verma A, **Singh RK**, Malhotra S, Waman YB, Walia A, Ray A, Sharma G. Azabicycloaminopyrido[2,3-d]pyrimidin-7(8H)-one derivatives as anti-inflammatory agents and their preparation and pharmaceutical compositions. PCT Int. Appl. (2006), WO 2006082492 A1.
2. Palle VP, **Singh RK**, Malhotra S, Waman YB, Verma A, Ray A, Sharma G. Preparation of pyrido[2,3-d]pyrimidines as anti-inflammatory agents. PCT Int. Appl. (2006), WO 2006056863 A1.
3. Palle VP, Verma AK, Salman M; **Singh RK**, Waman YB; Sharma G; Ray A. Preparation of heterocyclic derivatives as anti-inflammatory agents. PCT Int. Appl. (2006), WO 2006016237 A2.
4. Verma A, Malhotra S, **Singh RK**, Palle ABVP, Walia A, Sharma G. Novel anti-inflammatory agents: 2753/DEL/2006 (India).
5. Brard L, Kalkunte S, and **Singh RK**. Heterocycles and Derivatives thereof and methods of manufacture and therapeutic use: PCT/US 2006/047320.
6. Brard L, **Singh RK**, Kalkunte S, Strongins R, Onur A. Organometallic Complexes as therapeutic agents. WO/2008/070557(PCT/US2007/086080).
7. Scholler G, Kalkunte S, **Singh RK**, Kim KK, Lange TS, Brard L. nitrofurans compounds as potential anticancer and anti-angiogenic agents. PCT/US 2007/001527.
8. Brard L, **Singh RK**, Kim KK, Scholler G. N-Amino Tetrahydrothiazine derivatives, method of manufacture and use. WO/2008/091946 (PCT/US2008/051794).
9. Verma AK, Palle VP, Malhotra S, **Singh RK**, Walia A, Bajpai M, Chopra P, Ray A. Anti-inflammatory agents. WO/2008/078249.
10. Ray A, Palle VP, Verma A, **Singh RK**, Waman YB, Walia A, Sharma G. Azabicyclo derivatives as anti-inflammatory agents. US20090036472.
11. Ray A, Malhotra S, Palle VP, Verma A, **Singh RK**, Waman YB, Sharma G. Pyrido2',3-Dipyrimidines as anti-inflammatory agent. US20090131430.
12. Moore, RG, **Singh RK**. Adamantyl derivatives as therapeutic agents. US61/567,223.
13. Moore RG, **Singh RK**. HE4 based gene and antibody therapy of human diseases and malignancies, methods and applications. US61/493,881.

OTHER PEER-REVIEWED PUBLICATIONS

1. Singh RK. Lactams acetals in organic synthesis: Thesis, http://jmi.nic.in/Research/ab2004_chemistry_rksingh.pdf.

PUBLISHED ABSTRACTS IN REFERREED JOURNALS

1. Lee D, Kalkunte S, Singh RK, Laurent B, Scholler GS. Sulforaphane is cytotoxic to neuroblastoma cells both in-vitro and in-vivo. *Pediatric, Blood and Cancer* 48:638, 2007.
2. Koto K, Brard L, Bosenberg M, Dorf L, Singh RK, Kim K, Illenye S, Sholler GS.(2008). *Neuro-Oncology* Vol: 10, Issue: 3, P:513-514.
3. Robison K, Kim KK, Singh R, Lange T, Granai CO, Brard L*. The use of a vitamin D derivative in a mouse xenograft ovarian cancer model. *Gynecol Oncol* 108 (2008) S68.

BOOKS AND BOOK CHAPTERS

None

OTHER NON-PEER REVIEWED PUBLICATIONS

None

CORPORATE AUTHORSHIP OR MULTICENTER TRIALS

(None)

PUBLICATIONS SUBMITTED OR IN PREPARATION

ABSTRACTS

1. McCourt C, Kalkunte S, Strongin R, Alpturk O, Singh RK, Gurel V, Zhitkovich A, Granai C, Brard L. Iron Salophene is a potent inducer of apoptosis in ovarian cancer. 26th Annual Meeting of the New England Association of Gynecologic Oncologists, Manchester, VT, June 9-11, 2006.
2. Singh RK, Lieb C, Kim KK, Singh AP, Lange TL, Brard L. Design, synthesis and antiproliferative activities of novel Indole ethyl Isothiocyanates; abstract-75, 14th Annual Hospital Research Celebration, Rhode Island Hospital, Providence, RI, October 21, 2006.
3. Kim KK, Singh RK, Lange TL, Brard L. Design, synthesis and biological activities of novel iron chelators in ovarian cancer;abstract-72,14th Annual Hospital Research Celebration, Rhode Island Hospital, Providence, RI, October 21, 2006.
4. Robinson K, Kalkunte S, Singh RK, Kim KK, Lange TL, Brard L.B3CD is a potent anticancer agent for pancreatic cancer. abstract-6,14th Annual Hospital Research Celebration, Rhode Island Hospital, Providence, RI, October 21, 2006.
5. Brard L, Singh RK, Kim KK, Lange TS. 3-Bromoacetoxy-Calcidiol (B3CD) inhibits growth of ovarian cancer cells by inducing apoptosis and inhibiting angiogenesis. 9th International Symposium on Anti-Angiogenic Agents: Recent

- Advances and Future Directions in Basic and Clinical Cancer Research, February 1-3, San Diego, CA.
6. Brard L, Singh RK, Kim KK, Lange TS. Antiendothelial and Antiangiogenic Properties of Benzyl isothiocyanate (BITC) and Phenethyl isothiocyanate (PEITC). 9th International Symposium on Anti-Angiogenic Agents: Recent Advances and Future Directions in Basic and Clinical Cancer Research, February 1-3, San Diego, CA.
 7. Brard L, Singh RK, Kim KK, Lange TS. Iron Chelators Deferoxamine (DFO) and Diethylenetriaminepentaacetic Acid (DTPA) Inhibit Endothelial Cell Proliferation and Angiogenesis. 9th International Symposium on Anti-Angiogenic Agents: Recent Advances and Future Directions in Basic and Clinical Cancer Research, February 1-3, San Diego, CA.
 8. Brard L, Singh RK, Kalkunte S K, Lange TS, Kim KK, Dizon DS. Isothiocyanates inhibit growth of ovarian cancer cells by inhibiting epidermal growth factor receptor signaling and c-Myc expression. 38th Annual Meeting on Women's Cancer, Society of Gynecologic Oncologists, San Diego, CA, March 3-7, 2007.
 9. Brard L, Singh RK, Lieb C, Kim K, Lange TS, Singh AP. Indole-ethyl-isothiocyanates as potent antiproliferative agents. 38th Annual Meeting on Women's Cancer, Society of Gynecologic Oncologists, San Diego, CA, March 3-7, 2007.
 10. Robison KM, Singh RK, Kalkunte S, Lieb C, Kim KK, Lange TS, Brard L. Isothiocyanates are active in the treatment of ovarian cancer in an animal model. 38th Annual Meeting on Women's Cancer, Society of Gynecologic Oncologists, San Diego, CA, March 3-7, 2007.
 11. Lee D, Kalkunte S, Singh RK, Laurent B, Scholler GS. Sulforaphane is cytotoxic to neuroblastoma cells both in vitro and in vivo. 2007, Pediatric Academic Society's Annual Meeting, May5-8 Toronto, Canada.
 12. Lee D, Kalkunte S, Singh RK, Laurent B, Scholler GS. Sulforaphane is cytotoxic to neuroblastoma cells both in vitro and in vivo. 2007 ESPR abstract, March 9-11, Philadelphia.
 13. Ajay P Singh, Singh RK, Satyan SK, Nussbaum R, Kim KK, Jin H, Torres MS, Brard L and Vorsa N. Cranberry proanthocyanidines sensitize ovarian cancer cells to platinum drugs Abstract No-1090187, ACS 2007 meeting, Boston(ACS conference at 2007 Boston, covered by all national dailies and news portals).

SCHOLARLY WORK PUBLISHED IN OTHER MEDIA

PEER-REVIEWED and NON-PEER-REVIEWED

Ajay P Singh, Singh RK, Satyan SK, Nussbaum R, Kim KK, Jin H, Torres MS, Brard L and Vorsa N. Cranberry proanthocyanidines sensitize ovarian cancer cells to platinum drugs Abstract No-1090187, ACS 2007 meeting, Boston (ACS conference at 2007 Boston, covered by national dailies and news portals).

1. www.cranberryinstitute.org/news/.../CHN_Volume7.html.
2. www.docstoc.com/docs/17652818/PHILADELPHIA

3. www.sciencedaily.com/releases/2007/08/070821143625.htm.
4. www.cbsnews.com/.../main3190051

INVITED PRESENTATIONS

None.

GRANTS

(a): FUNDED GRANTS

1. Swim Across America. Genomic Therapy of ovarian cancer.
2010-2011
Role: Investigator

(b): PROPOSAL SUBMITTED

2. NIH/NCI. RO1; Development of MT19c as a new class of agent to treat ovarian cancer. Role: Principal Investigator

UNIVERSITY TEACHING ROLES

Taught following courses at undergraduate students between 1993-1997 in the Department of Chemistry, Birla Institute of technology and Science, Pilani, Rajasthan, India.

1. CHEM C121, Organic Chemistry [three semesters; No of student: 40]
2. CHEM C142 Chemistry II [Three semesters/one class; No of student: 40]
3. TA C211 Measurement Techniques (Laboratory) [three semesters/ two classes; No of student: 40]

HOSPITAL TEACHING ROLES

1. Mentored Ob/Gyn medical fellow 7/2009- 6/2010, No of student -2