

Garima Khandelwal

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Work Experience

May 2018 - Research Associate (Bioinformatics)
University College London.

June 2014 - Postdoctoral Research Scientist

April 2018 Cancer Research UK, Manchester Institute, UK

Education

Ph.D. Indian Institute of Technology, Delhi, India
2007-2012 **Dissertation:** Development of energy based signatures for deciphering prokaryotic genome organization. **Advisor:** Prof. B. Jayaram.

M.Sc. Bioinformatics (1st division)
2004-2006 Department of Biotechnology, Banasthali Vidyapith, Rajasthan, India

B.Sc. Life Sciences (1st division)
2001-2004 VRG Girls PG College, Jiwaji University, Gwalior, Madhya Pradesh, India

Awards and fellowships:

- Best poster award at Lung Cancer Centre of Excellence - Summer School (9-10th July, 2015 at York, UK).
- 2nd position in Eli Lilly Asia outstanding thesis award 2013.
- Senior research fellowship (SRF) by Department of Biotechnology, India (2009-2012).
- Junior research fellowship (JRF) by Department of Biotechnology, India (2007-2008).

Technical skills

- Honor's Diploma in Web Centric Computing from NIIT.
- Programming: R, Shell scripting, C, C++, Java, ASP.NET, matlab, HTML.
- Database management: MS-SQL.
- Computer architectures and hardware platforms: Unix, Linux, DOS, Windows, Mac OS, HPC.
- NGS analysis: WGS, WES, RNA-Seq, ChIP-Seq, ChIRP-Seq, RIP-Seq, ATAC-Seq, iClip, TCR-Seq, ChIP-Rx.
- Bioinformatics softwares: Bioconductor, GSEA, Gephi, Cytoscape, BaseSpace, Samtools, Bedtools, BLAST, CLUSTALW, CPDB, DAVID, MEME, IPA etc.
- Public and private domain databases like: Ensembl, UCSC, ENCODE, RefSeq, GEO, ArrayExpress, MSigDB, Swissprot, PDB, NDB, RNAdb.

Publications

1. Skalska, L. Beltran, M., Begley, V., Lukauskas, S., **Khandelwal, G.**, Faull, P., Bhamra, A., Wellman, R., Tvardovskiy, A., Foster, B. M., Herrero, J., Surinova, S., Snijders, B., Bartke, T. and Jenner, R. G. “Nascent RNA antagonises the interaction of regulatory proteins with chromatin”. (Under revision in *Molecular Cell*).
2. Lee, L., Alrasheed, N., **Khandelwal, G.**, Fitzsimons, E., Richards, H., Wilson, W., Chavda, S. J., Henry, J., Conde, L., De Massy, M. R., Chin, M., Galas-Filipowicz, D., Herrero, J., Chain, B., Quezada, S. A. and Yong, K. “Regulatory T cell abundance and upregulation of immune-regulatory receptors on effector T cells are early indicators of relapse post ASCT for multiple myeloma”. (Under review in *Frontiers in Immunology*).
3. Cottone, L., Cribbs, A., **Khandelwal, G.**, Wells, G., Ligammari, L., Philpott, M., Tumber, A., Lombard, P., Hookway, E., Szommer, T., Johannson, C., Brennan, P., Pillay, N., Jenner, R., Oppermann, U. and Adrienne Flanagan. “Inhibition of histone H3K27 demethylases inactivates brachyury (TBXT) and promotes chordoma cell death”. *Cancer Res.* **2020**, 80:4540–51. doi: 10.1158/0008-5472.CAN-20-1387.
4. Villegas-Mendez, A., **Khandelwal, G.**, McGowan, L.M., Dookie, R. S., Haley, M. J., George, C., Sims, D., Lord, G. M., Sinclair, L. V., Jenner, R. G. and Couper, K. N. “Exhausted CD4⁺ T Cells during Malaria Exhibit Reduced mTORc1 Activity Correlated with Loss of T-bet Expression”. *J Immunol.* 2020 Sep 15; 205(6): 1608–1619. doi: 10.4049/jimmunol.2000450.
5. Lee, R. J., **Khandelwal, G.**, Baenke, F., Cannistraci, A., McLeod, K., Mundra, P., Ashton, G., Mandal, A., Viros, A., Gremel, G., Galvani, E., M. L., Smith, Carragher, N., Dhomen, N., Miller, C., Lorigan P. and Marais R. “Brain microenvironment driven resistance to immune and targeted therapies in acral melanoma”. *ESMO Open* **2020**, 5:e000707. doi: 10.1136/esmoopen-2020-000707.
6. Beltran M., Tavares, M., Justin N., **Khandelwal, G.**, Ambrose, J., Foster, B., Kunzelmann, S., Herrero, J., Bartke, T., Gamblin, G., Wilson, J., Worlock, K., Tvardovskiy, A. and Jenner, R. “G-tract RNA removes Polycomb Repressive Complex 2 from genes”. *NSMB*, **2019**, 26(10):899-909. doi: 10.1038/s41594-019-0293-z.
7. Lallo, A., Gulati, S., Schenk, M. W., **Khandelwal, G.**, Berglund, U. W., Pateras, I. S., Chester, C. P. E., Pham, T. M., Kalderen, C., Frese, K. K., Gorgoulis, V.G., Miller, C., Blackhall, F., Helleday, T. and Dive, C. “Ex vivo culture of cells derived from circulating tumour cell xenograft to support small cell lung cancer research and experimental therapeutics.” *B. J. Pharmacol.* **2019**, 176(3):436-450. doi: 10.1111/bph.14542
8. Lallo, A., Frese, K. K., Morrow, C., Szczepaniak, Sloane, R., Gulati, S., Schenk, M. W., Trapani, F., Simms, N., Galvin, M., Brown, S., Hodgkinson, C. L., Priest, L., Hughes, A. M., Lai, Z., Cadogan, E. B., **Khandelwal, G.**, Simpson, K. L., Miller, C., Blackhall, F. H., O'Connor, M. J. and Dive, C. “The combination of the PARP inhibitor olaparib and the Wee1 inhibitor AZD1775 as a new therapeutic option for small cell lung cancer”. *Clin. Cancer Res.* **2018**, 24(20):5153-5164.

9. **Khandelwal, G.**, Girotti, M. R., Smowton, C. Taylor, S., Wirth, C., Dynowski, M., Frese, K. K., Brady, G., Dive, C., Marais, R., and Miller, C. “Next-Gen sequencing analysis and algorithms for PDX and CDX models. *Mol. Cancer Res.* **2017**, doi: 10.1158/1541-7786.MCR-16-0431.
10. Singh, A., Mishra, A., Khosravi, A., **Khandelwal, G.** and Jayaram, B. “Physico-chemical fingerprinting of RNA genes”. *Nuc. Acid Res.*, **2017**, 45, e47.
11. Morrow, C., Trapani, F., Metcalf, R., Bertolini, G., Hodgkinson, C., **Khandelwal, G.**, Kelly, P., Galvin, M., Carter, L., Simpson, K. L. Williamson, S., Wirth, C., Simms, N., Franklin, L., Frese, K. K., Rothwell, D. G., Nonaka, D., Miller, C., Brady, G., Blackhall, F. H. and Dive, C. “Tumourigenic non-small-cell lung cancer mesenchymal circulating tumour cells: a clinical case study”. *Annals of Oncology*, **2016**, 27(6), 1155–1160.
12. **Khandelwal, G.**, Lee, R. A., Beveridge, D. L. and Jayaram, B. “A Statistical thermodynamic model for investigating the stability of DNA sequences from oligonucleotides to genomes”. *Biophys. J.* **2014**, 106(11), 2465-2473.
13. **Khandelwal, G.**, Gupta, J. and Jayaram, B. “DNA energetics based analyses suggest additional genes in prokaryotes”. *J Bio Sc.*, **2012**, 37, 433-444.
14. **Khandelwal, G.** and Jayaram, B. “DNA-water interactions distinguish messenger RNA genes from transfer RNA genes”. *J. Am. Chem. Soc.*, **2012**, 134(21), 8814-8816.
15. **Khandelwal, G.** and Jayaram, B. “A Phenomenological model for predicting melting temperatures of DNA sequences”. *PLoS One*, **2010**, 5(8), e12433.
16. Shanker, A., Tripathi, D., **Khandelwal, G.**, Sharma, G., Agrawal, S. et. al. “Data mining and database development for simple sequence repeats of *Takifugu rubripes* (Japanese Pufferfish)”. *Journal of Biochemical and Cellular Archives*, **2006**.

Book Chapter

1. Mishra, D. and **Khandelwal, G.** “Command line tools in Linux for sequence alignments/handling large data files” in *Bioinformatics: Sequences, Structures, Phylogeny*, **2018**.
2. Jayaram, B., Mittal, A., Mishra, A., Acharya, C. and **Khandelwal, G.** "Universalities In Protein Tertiary Structures: Some New Concepts" GNR special issue on *Biomolecular Forms & Functions*, **2013**.

Conference Proceedings

1. Lee, R. J., Girotti, M. R., **Khandelwal, G.**, Baenke, B., Viros, A., Mandal, A., Bridgeman, J., Galvani, E., Gremel, G., Kalaitidou, M., et. al. “Tumour–microenvironment mediates resistance to immuno and targeted therapies in acral melanoma”. *Eur. J. Can.*, **2016**, 61, S188.

2. Lee, R. J., Girotti, M. R., Viros, A., Baenke, F., Mandal, A., **Khandelwal, G.**, Bridgeman, J., Galvani, E., Gremel, G., Kalaitidou, M., et. al. “Mechanisms of resistance to immuno and targeted therapies in acral melanoma”. *Cancer Research*, **2016**, 76(14), 2400-2400.
3. **Khandelwal, G.**, Lee, R. A., Beveridge, D. L. and Jayaram, B. “Statistical thermodynamics of DNA sequences based on a two state model of base pair steps”. *J. Biomol. Str. Dyn.* 17th Conversation. **2011**. Albany, New York, USA.

Talks and supervision

1. Secondary supervisor of MRes student working on “Detecting signaling pathways differentially regulated between striatum, corpus callosum and tumour regions in Glioblastoma Multiforme”.
2. Co-supervisor of BSc student working on “Relevance of mutational signatures in Multiple Myeloma”.
3. Secondary supervisor of BSc/MSci Applied Medical Sciences student working on “Improving the detection of somatic variants by using a genome graph”.
4. Talk on “Thermodynamic profile based structural classification of lncRNAs” at the Lung Cancer Centre of Excellence Winter Workshop, held during 1st–2nd December 2016 at York.
5. Talk on “Genomes to Hits Pathway: Chemgenome, A physico-chemical approach towards genome organization” at the conference on New Trends in Bioinformatics, held during 30th-31st August, 2012 at IIT Delhi.
6. Co-supervised two MSc Chemistry students at IIT Delhi working on “Interpreting physico-chemical properties of DNA”.
7. Talk on “Physico-chemical finger prints of DNA sequences with different functions” at the conference on Nucleic Acids in Disease & Disorder, held during Dec. 7th-9th, 2011 at IIT Delhi.
8. Co-supervised two MTech (Biotechnology) students at IIT Delhi working on “Identifying genes based on physico-chemical properties of DNA in eukaryotic genomes”.
9. Lectures and hands-on training in the area of genome analysis to over 250 trainees including PhD, masters and bachelor students as well as Post doctorates and Professors from various fields.
10. Provided tutorials to under graduate students in the field of Physical chemistry at IIT Delhi.