Kinjal Desai, PhD

Senior Research Associate – People Manager | The Hospital for Sick Children, Toronto, ON, Canada
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Education

2010 – 2016 **PhD in Genetics** | Dartmouth College, *Hanover, USA*
Thesis: *Characterizing the Impact of Single Nucleotide Variation in Breast Cancer*

2006 – 2009 **BSc in Life Sciences** | St. Xavier's College, *Mumbai, India*
GPA: 4.0 | Class Rank: 1st out of 148 students

Academic Appointments

2024 – present **Senior Research Associate – People Manager** | The Hospital for Sick Children, *Toronto, Canada*

2023 – 2025 Sessional Instructor and Coordinator, Advanced Human Genetics (1 or 2 terms annually) | Department of Molecular Genetics, University of Toronto, *Toronto, Canada*

2022 – 2024 Research Associate | The Hospital for Sick Children, *Toronto, Canada*

2016 – 2022 Postdoctoral Research Fellow | The Hospital for Sick Children, *Toronto, Canada*

2012 – 2016 Visiting Graduate Research Student | Department of Medical Biophysics, University of Toronto, *Toronto, Canada*

2010 – 2016 Graduate Research Student | Dartmouth College, *Hanover, USA*

2009 – 2010 Graduate Student | Sophia College & University of Mumbai, *Mumbai, India*

2006 – 2009 Undergraduate Student | St. Xavier's College, *Mumbai, India*

Professional Memberships

2019 – present Member | American Association for Cancer Research (AACR)

Research Expertise and Skills

Research Expertise:

Cancer biology | Tumour initiation and progression | Functional genomics | Bioinformatics | Computational epigenetics | Transcriptional regulation | Epigenomics | Developmental and stem cell biology | Pediatric neuro-oncology | Preclinical drug targeting

Experimental Techniques:

- *In vitro:* ChIP, CUT&RUN, CUT&Tag | 3C, 4C, low-C; ATAC-seq | CRISPR-Cas9 screens | confocal imaging | flow cytometry and FACS | single-cell data generation
- *In vivo:* Mouse modelling of complex disease | subQ and orthotopic tumour engraftment | drug administration by oral gavage and IP injection | perfusion

Computational Skills:

- Analysis & integration of NGS, scRNA- and scATACseq datasets
- R, Python, and Bash scripting | High-performance computing workflows
- Data visualization and statistical analysis
- Super-enhancer identification (ROSE)| Variant enrichment analysis (VSE)
- Mouse colony management software (IDA, LAMS) | MRI analysis (MIPAV)

Research Grants and Awards

Years Active	Project Title / Purpose	Lead PI/Recipient	Amount (CAD)
2025–2027	Identification of key windows of vulnerabilities to enhance the targeted treatment of paediatric high-grade gliomas (Garry Hurvitz Brain and Mental Health Outcomes Catalyst Award)	Kinjal Desai (KD)	$100,000
2025	Travel support to present at the 21st Biennial Canadian Neuro-Oncology Meeting, Vancouver, BC (SickKids RTC Travel Award)	KD	~$1,500
2021–2026	Tracing the Cellular and Molecular Origins of Mouse and Human Medulloblastoma (CIHR Grant)	Peter Dirks; lead contributor: KD	$975,000
2024	Travel support for CRUK workshop (SickKids RTC Travel Award) and Cancer Research, UK	KD	~$2,500
2021–2022	Targeting the transition between quiescent and activated stem cells in medulloblastoma (b.r.a.i.n.child grant)	Peter Dirks; lead contributor: KD	$25,000
2018–2019	Investigating the switch between quiescence and proliferation in the stem cell compartment of SHH medulloblastoma (Meagan's Walk grant)	Peter Dirks; lead contributor: KD	$25,000
2017–2018	Defining in vitro culture system for primary medulloblastoma cells (b.r.a.i.n.child grant)	Peter Dirks; lead contributors: KD with Dr. Sonam Dolma	$25,000

Research Experience

Research Interest: Decoding tumour emergence for early clinical intervention in paediatric brain tumours

Senior Research Associate – People Manager
Hospital for Sick Children, Toronto, Canada (Dirks Laboratory) | *2024 – present*
Projects in Preparation:

1. Bromodomain and mTOR inhibition alter the chromatin landscape and disrupt stemness in SHH-medulloblastoma (***first author***; manuscript in preparation)
2. Transcription Factor-Mediated Rescue of Differentiation Failure in Glioblastoma (***co-corresponding author***; manuscript in preparation)
3. Defining chromatin and transcriptional changes during early SHH-medulloblastoma progression and normal cerebellar development (***first and corresponding author***; manuscript in preparation)
4. Modelling glioma progression in mice: P53 loss in the stem cell compartment paired with a mutagenic insult drives gliomagenesis (***co-corresponding author***; manuscript in preparation)
5. Targeting BRAF mutation in early-stage pediatric high-grade gliomas mitigates tumorigenesis (***co-corresponding author***; manuscript in preparation)

These studies are supported by both cell-based systems and transgenic mouse models and will culminate in multiple first-author and corresponding author publications currently in preparation.

Postdoctoral Fellowship and Research Associateship

Hospital for Sick Children, Toronto, Canada (Dirks laboratory) | 2016 – 2024

Published Projects:

1. Identification of a targetable stem cell fate transition event leading to tumour development in sonic hedgehog medulloblastoma (Desai et al., *Nat Commun*); **sole first author**
2. Developing cancer models to identify events leading to the formation of pediatric brain cancer (Selvadurai*, Luis* et al., *Cell Reports*); **contribution: key experiments, co-wrote manuscript**
3. Identifying chromatin reorganizing factors operating in stem cells and leading to glioblastoma development (Park et al., *Cell Stem Cell*, Gallo et al., *Cancer Cell*, Bullivant et al., manuscript in prep); **bioinformatic contributor**

Doctoral research

Dartmouth College and University of Toronto (Lupien laboratory) | 2010 – 2016

Published Projects:

1. Identifying the convergence of inherited genetic variants and mutations in the set of regulatory elements targeting the breast cancer driver Estrogen Receptor 1 (ESR1) (Desai* et al., *Nat Genetics*); **co-first author**
2. Inferring Human Phenotype Networks from Genome-Wide Genetic Associations (Desai* et al, *LCNS*); **co-first author**
3. Elucidating the role of noncoding genetic variation impacting transcription factor binding to promote cancer susceptibility (Ghoussaini et al., *Nat Commun*; Chahar et al., *Mol Cell Bio)*; **contribution: key experiments, bioinformatic analyses**

Publications

- 9 high-impact peer-reviewed articles | 1 peer-reviewed computational conference proceeding and book chapter | 3 first author papers | h-index: 9 | total citations: 1232.
- Between 2020 and 2025, I focused on leading several high-investment, high-impact projects that are now culminating in multiple outputs.

Desai, K., Wanggou, S., Luis, E., Whetstone, H., Yu, C., Vanner, R. J., Selvadurai, H. J., Lee, L., Vijay, J., Jaramillo, J. E., Fan, J., Guilhamon, P., Kushida, M., Li, X., Stein, G., Kesari, S., Simons, B. D., Huang, X., & Dirks, P. B. (**2025**). OLIG2 mediates a rare targetable stem cell fate transition in sonic hedgehog medulloblastoma. Nature Communications, 16(1), 1092. https://doi.org/10.1038/s41467-024-54858-y

Selvadurai, H. J.*, Luis, E.*, ***Desai, K.***, Lan, X., Vladoiu, M. C., Whitley, O., Galvin, C., Vanner, R. J., Lee, L., Whetstone, H., Kushida, M., Nowakowski, T., Diamandis, P., Hawkins, C., Bader, G., Kriegstein, A., Taylor, M. D., & Dirks, P. B. (**2020**). Medulloblastoma Arises from the Persistence of a Rare and Transient Sox2 Granule Neuron Precursor. Cell Reports, 31(2), 107511. https://doi.org/10.1016/j.celrep.2020.03.075

Park, N. I., Guilhamon, P., ***Desai, K.***, McAdam, R. F., Langille, E., O'Connor, M., Lan, X., Whetstone, H., Coutinho, F. J., Vanner, R. J., Ling, E., Prinos, P., Lee, L., Selvadurai, H., Atwal, G., Kushida, M., Clarke, I. D., Voisin, V., Cusimano, M. D., … Dirks, P. B. (**2017**). ASCL1 Reorganizes Chromatin to Direct Neuronal Fate and Suppress Tumorigenicity of Glioblastoma Stem Cells. Cell Stem Cell, 21(3), 411. https://doi.org/10.1016/j.stem.2017.08.008

Bailey, S. D.*, ***Desai, K.****, Kron, K. J., Mazrooei, P., Sinnott-Armstrong, N. A., Treloar, A. E., Dowar, M., Thu, K. L., Cescon, D. W., Silvester, J., Yang, S. Y. C., Wu, X., Pezo, R. C., Haibe-Kains, B., Mak, T. W., Bedard, P. L., Pugh, T. J., Sallari, R. C., & Lupien, M. (**2016**). Noncoding somatic and inherited single-nucleotide variants converge to promote ESR1 expression in breast cancer. Nature Genetics, 48(10), 1260–1266. https://doi.org/10.1038/ng.3650

Bailey, S. D.*, Zhang, X.*, ***Desai, K.***, Aid, M., Corradin, O., Cowper-Sal Lari, R., Akhtar-Zaidi, B., Scacheri, P. C., Haibe-Kains, B., & Lupien, M. (**2015**). ZNF143 provides sequence specificity to secure chromatin interactions at gene promoters. Nature Communications, 2, 6186. https://doi.org/10.1038/ncomms7186

Darabos, C.*, ***Desai, K.****, Cowper-Sal·lari, R., Giacobini, M., Graham, B. E., Lupien, M., & Moore, J. H. (**2013**). Inferring Human Phenotype Networks from Genome-Wide Genetic Associations. Evolutionary Computation, Machine Learning and Data Mining in Bioinformatics, 23–34. https://doi.org/10.1007/978-3-642-37189-9_3

Guo, H., Ahmed, M., Zhang, F., Yao, C. Q., Li, S., Liang, Y., Hua, J., Soares, F., Sun, Y., Langstein, J., Li, Y., Poon, C., Bailey, S. D., ***Desai, K.***, Fei, T., Li, Q., Sendorek, D. H., Fraser, M., Prensner, J. R., … He, H. H. (**2016**). Modulation of long noncoding RNAs by risk SNPs underlying genetic predispositions to prostate cancer. Nature Genetics, 48(10), 1142–1150. https://doi.org/10.1038/ng.3637

Gallo, M., Coutinho, F. J., Vanner, R. J., Gayden, T., Mack, S. C., Murison, A., Remke, M., Li, R., Takayama, N., ***Desai, K.***, Lee, L., Lan, X., Park, N. I., Barsyte-Lovejoy, D., Smil, D., Sturm, D., Kushida, M. M., Head, R., Cusimano, M. D., … Dirks, P. B. (**2015**). MLL5 Orchestrates a Cancer Self-Renewal State by Repressing the Histone Variant H3.3 and Globally Reorganizing Chromatin. Cancer Cell, 28(6), 715–729. https://doi.org/10.1016/j.ccell.2015.10.005

Chahar, S., Gandhi, V., Yu, S., ***Desai, K.***, Cowper-Sal-lari, R., Kim, Y., Perekatt, A. O., Kumar, N., Thackray, J. K., Musolf, A., Kumar, N., Hoffman, A., Londono, D., Vazquez, B. N., Serrano, L., Shin, H., Lupien, M., Gao, N., & Verzi, M. P. (**2014**). Chromatin profiling reveals regulatory network shifts and a protective role for hepatocyte nuclear factor 4α during colitis. Molecular and Cellular Biology, 34(17), 3291–3304. https://doi.org/10.1128/MCB.00349-14

Ghoussaini, M., Edwards, S. L., Michailidou, K., Nord, S., Cowper-Sal Lari, R., ***Desai, K.***, Kar, S., Hillman, K. M., Kaufmann, S., Glubb, D. M., Beesley, J., Dennis, J., Bolla, M. K., Wang, Q., Dicks, E., Guo, Q., Schmidt, M. K., Shah, M., Luben, R., … Australian Ovarian Cancer Management Group. (**2014**). Evidence that breast cancer risk at the 2q35 locus is mediated through IGFBP5 regulation. Nature Communications, 4, 4999. https://doi.org/10.1038/ncomms5999

Academic Service and Professional Experience

2025 – 2026 **Member** | Program Head Search Committee, Developmental, Stem Cell, and Cancer Biology, The Hospital for Sick Children, *Toronto, Ontario, Canada*

June 2025 **Session Chair** | Scientific Retreat, Departments of Genetics and Genome Biology & Developmental, Stem Cell, and Cancer Biology, The Hospital for Sick Children, *Blue Mountain, Ontario, Canada*

June 2025 **Judge, Oral Presentations & Posters**| Garron Family Cancer Centre Research Day, The Hospital for Sick Children, *Toronto, Canada*

2023 – 2025 **Panelist (Scientific Reviewer and Scientific Officer), Grant and Fellowship Applications** | Canadian Cancer Society, *Toronto, Canada*

October 2024 **Invited Speaker** | University of Toronto – Molecular Genetics & Microbiology Student Union (MGYSU), *Toronto, Canada*

August 2024 **Judge, Student Poster Presentations** | Summer Research Symposium (SSuRe), SickKids, *Toronto, Canada*

July 2024 **Invited Participant** | CRUK Children's Brain Tumour Excellence Summer School, *University of Cambridge, UK*

July 2024 **Invited Panelist** | The Hospital for Sick Children Research Integrity Symposium, *Toronto, Canada*

Select Oral Presentations

OLIG2 mediates a rare targetable stem cell fate transition in sonic hedgehog medulloblastoma. The Hospital for Sick Children departments of Genetics and Genome Biology (GGB) and Developmental, Stem Cell, and Cancer Biology (DSCB) Scientific Retreat, *Blue Mountain, ON, Canada* (**2025**) – invited speaker.

OLIG2 mediates a rare targetable stem cell fate transition in sonic hedgehog medulloblastoma. Pacific Pediatric Neuro-Oncology Consortium and the Children's Brain Tumor Network, *virtual presentation to an audience of ~40 clinicians, scientists and patient advocates* (**2025**) – invited speaker with Dr. Dirks.

OLIG2 mediates a rare targetable stem cell fate transition in sonic hedgehog medulloblastoma. SickKids Brain Tumour Research Centre Scientific Symposium – Celebrating 25 Years of Breakthrough Science, *Toronto, ON, Canada* (**2024**) – invited speaker.

OLIG2 mediates a rare targetable stem cell fate transition in sonic hedgehog medulloblastoma. Childhood Brain Tumour Centre of Excellence International Summer School, *Cambridge, England* (**2024**).

OLIG2 mediates a rare targetable stem cell fate transition in sonic hedgehog medulloblastoma. Canadian Epigenetics, Environment and Health Research Consortium (CEEHRC) 8th Annual Conference on Epigenetics, *Estérel, Quebec, Canada* (**2022**) – invited speaker.

The History and Progress of Cancer Research. Public science lecture hosted virtually by Goethe-Zentrum Hyderabad, *India* (**2020**) – invited speaker.

Desai K. Integrative Genomics Identify *Olig2* as a Regulator in SHH Medulloblastoma. SickKids Brain Tumour Research Centre Retreat, *Killarney, ON, Canada* (**2019**) – invited speaker.

Select Poster Presentations

Year	Project Title	Conference and Location	Award
2025	OLIG2 mediates a rare targetable stem cell fate transition in SHH medulloblastoma	21st Biennial Canadian Neuro-Oncology Meeting, Vancouver, BC, Canada	—

2023	OLIG2 mediates a rare targetable stem cell fate transition in SHH medulloblastoma	SickKids Department of Stem Cell and Cancer Biology Retreat, Niagara-on-the-Lake, ON, Canada	Best Poster Presentation
2021	Targeting the transition between quiescent and activated stem cells in medulloblastoma	CEEHRC 7th Annual Conference on Epigenetics (virtual)	N/A
2019	Integrative genomics identify OLIG2 as a regulator in SHH medulloblastoma	CEEHRC Network, Banff, AB, Canada	Best Poster Presentation
2015	Functional correlation using DNase-seq identifies targets of breast cancer risk loci	EACR Epigenetic Mechanisms in Cancer, Berlin, Germany	—
2013	Delineating the regulatory function of the 6q25.1 breast cancer risk-locus	James Lepock Memorial Symposium, University of Toronto, Toronto, ON, Canada	Outstanding Poster Presentation
2012	Building a Human Phenotype Network on Shared Genetic Variants	American Society of Human Genetics, San Francisco, CA, USA	Best Paper
2010	Molecular mechanisms of mood disorder using *D. discoideum* as a neuropharmacological model	National Seminar on Fungal Biotechnology, Mithibai College, Mumbai, India	Best Poster Presentation

Teaching and Mentorship Experience

Mentorship of Trainees

The Hospital for Sick Children and University of Toronto | 2011 – present

- **PhD co-supervisor**: Juan Pablo Escorcia (2024–present, co-supervised with Dr. Peter Dirks)
- **MHSc research practicum supervisor**: Aastha Patel (2024–2025); Connie Fierro (2025–2026)
- **Research mentorship**: providing conceptual feedback and advice, helping with experimental design, monitoring progress, and sharing feedback on their results; 3 PhD students, 3 PhD rotation students, 2 MSc students, 6 summer students.
- **Undergraduate engagement & outreach**: Hosted site visits and informational interviews for 5 students from U of T Mississauga's Anatomy and Physiology program.

Course Coordinator and Lead Instructor

Advanced Human Genetics (MMG 3001Y), Department of Molecular Genetics, University of Toronto | 2023 – 2026

- Lead instructor and coordinator for a two-semester core graduate course in the Master of Health Sciences (MHSc) in Medical Genomics program, enrolling approximately 22–25 students annually.
- This includes hands-on teaching, mentorship, and course coordination, and conveying complex material in an accessible way over a sustained period of time (1 or 2 terms).

Co-Organizer and Instructor

Low Input Epigenomics Workshop, Wellcome Genome Campus, UK | 2024 & 2025

- Co-organizer and lead instructor (CUT&RUN and CUT&Tag module) of this competitive, international 8-day workshop for senior PhD students, postdocs, and early-career investigators.

- Delivered comprehensive and hands-on theoretical and laboratory training on epigenomic profiling in rare cell populations and low-input samples.

Additional Teaching Experience

2019 – 2023 **Instructor** | University of Toronto School of Continuing Studies, *Toronto, Canada*
2020 – 2025 **Guest Lecturer**| Advanced Human Genetics (MMG 3001Y) | Department of Molecular Genetics, University of Toronto, *Toronto, Canada*
2019 **Guest Lecturer** | Royal Conservatory of Music, *Toronto, Canada*
2020 **Guest Expert** | Online Healthcare Forum, *Toronto, Canada*
2011 **Teaching Assistant** | Dartmouth College, *Hanover, USA*

Community Service

2024 – present **Advisory Board Member** | Stay at Home Nursing Care, *Toronto, Canada*
2023 – present **Scientist Partner** | Skype a Scientist, *Philadelphia, USA*
2023 – present **Community Outreach Representative** | Canadian Cancer Society, *Toronto, Canada*
2016 – 2023 **Community Outreach Lead** | Toronto Research Information Outreach Team (R.I.O.T.) and the Canadian Cancer Society, *Toronto, Canada*
2019 – 2022 **Child Life Volunteer** | The Hospital for Sick, *Toronto, Canada*

Press Coverage and Mentions

My research has received widespread attention in both the scientific community and popular media, including coverage in national news outlets, international science platforms, and university features:

- Researchers at SickKids Make Discovery That Can Stop Childhood Brain Tumour Growth (TV news segment video clip) – CityNews
- Research Discovery Halts Childhood Brain Tumour Before It Forms – SickKids News
- Targeting Brain Tumour Stem Cells (podcast episode) – BTRC Conversations: The Fight Against Brain Tumours
- New Research Identifies Key Mechanism to Stop Childhood Brain Tumour Growth – ScienceDaily
- Dr. Kinjal Desai: Medical Genomics Faculty Spotlight – University of Toronto Molecular Genetics News
- MoGen Scientists Share Discovery Halting Childhood Brain Tumour Before It Starts – University of Toronto Molecular Genetics News
- New therapy for childhood brain cancer halts tumor formation – Earth.com
- Breakthrough Research Prevents Formation of Childhood Brain Tumors – EurekAlert!
- New Discovery Offers Hope for Stopping Childhood Brain Tumors Before They Start – News-Medical.net
- Breakthrough Halts Childhood Brain Tumor Before It Starts – Mirage News
- Breakthrough Research Prevents Formation of Childhood Brain Tumors – Bioengineer.org
- Curtana Pharmaceuticals Announces Breakthrough in Pediatric Brain Cancer Treatment with Dual Studies Published in Nature Communications – PRLog
- Health World Cancer Day: A Therapy Against the Most Common Pediatric Malignant Brain Tumor (translated from Italian) – Focus.it
- Targeting Cell Fate Transitions in Medulloblastoma: Precision and Context Matter – Springer Nature Research Communities
- Researchers from Hospital for Sick Children Report Details of New Studies and Findings in the Area of Medulloblastoma (OLIG2 mediates a rare targetable stem cell fate transition in sonic hedgehog medulloblastoma) – Stem Cell Week, NewsRX LLC