PRAKRUTI UDAY

Em: prakrutiuday@bccrc.ca
Ph: +1 (604) 360-9933

EDUCATION

University of British Columbia 2021-present

- PhD Interdisciplinary Oncology, 95% GPA

University of British Columbia 2016-2021

- BSc. (Hons) Biochemistry, 86.3% GPA

RESEARCH EXPERIENCE

Weng Lab, Terry Fox Labs, BC Cancer Research Centre Sept 2021-present

MSc Student transferred to PhD program in May 2023. PhD Candidate as of July 2023

- Investigating molecular mechanisms of B-cell lymphomagenesis in human B-cell models
- Genetically manipulating primary and cell line human B-cells using CRISPR/Cas9 gene editing tools and lentivirally delivered small hairpin RNA
- Employing various sequencing-based techniques, such as linear amplification PCR, ATAC-seq and ChIP-seq, to screen and characterize translocation fidelity and changes to chromatin accessibility, in B-cell lymphoma
- Awarded the Elizabeth C. Watters Fellowship & BC Cancer Rising Star Award to support research efforts

Levings Lab, BC Children's Hospital Research Institute (BCCHRI): Department of Surgery Jan 2020-Apr 2021

Co-op Student and Undergraduate Honours Thesis Student, Gene Editing Team

- Successfully assisted in multi-week experiments on expanded ex-vivo Tregs genetically modified using electroporation to introduce CRISPR/Cas9 gene editing tools into cells
- Performed multi-color FACS experiments with compensation to monitor behavior of manipulated cells
- Demonstrated effective sterile technique for the transfection, culturing and maintenance of primary human cells and immortalized adherent and suspension cell lines
- Completed and successfully defended an Honors Thesis project titled 'Investigating the Role of PTEN Phosphatase in the PI3K-AKT Pathway in Regulatory T cells using Genome Editing'

Zymeworks Inc. May 2019-Dec 2019

Co-op Student, Antibody Generation

- Supported the development and set-up of experimental tasks related to antibody discovery and its platforms
- Developed antibody-based screening assays for the quality control of antigens using FACS
- Constructed DNA libraries using extensive molecular cloning and diagnostic techniques
- Utilized high attention to detail while performing extensive molecular biology techniques
- Collaborated regularly and efficiently with the AbGen team and provided regular reports and updates on my progress to them at biweekly meetings

Côté Lab, University of British Columbia (UBC): Department of Pathology Jun 2018-May 2019

Summer Research Student and Volunteer

- Successfully completed an independent project studying the effects of multiple HHV co-infections on the telomere length of Ugandan children born to HIV+ and HIV- mothers in a cohort of 31 infants with more than 200 longitudinal samples
- Performed DNA extraction and mtDNA qPCR, and analyzed data using XLS Stats
- Presented findings of the project on Pathology Research Day in May 2019 at VGH
- Gained experience working in sterile conditions to culture immortal fibroblasts, prepared media and drug stock solutions for a project studying mitochondrial toxicity induced by exposure to anti-retroviral drugs

Mayor Lab: Michael Smith Laboratories Sep 2017-Jan 2018

Volunteer

- Assisted in culturing of bacteria using sterile techniques and preparation of stock solutions, buffers and SDS-PAGE gel plates for a project studying protein degradation via ubiquitination
- Monitored and analyzed the growth of bacteria by collecting absorbance values using a UV spectrophotometer and plotting the data in Microsoft Excel

LABORATORY SKILLS

MOLECULAR BIOLOGY: PCR, qPCR, Inverse PCR, ddPCR, Agarose Gel Electrophoresis, SDS-PAGE, Western Blot, ATAC-seq, Molecular Cloning (Traditional and Golden Gate Cloning with Restriction Endonucleases; Primer Design; Site-Directed Mutagenesis), Extraction of DNA, Miniprep and Midiprep of Plasmid DNA, Generating a DNA Library, Sequence Analyses, Bead and Antibody-based Assay Development, Ion Chromatography, Protein Purification, Gene Editing with CRISPR/Cas9 technology, HDR Knock-In, ATAC & ChIP-seq, Tapestri single-cell DNA and proteomic profiling, LAM (linear amplification)-PCR

CELL BIOLOGY: Transforming and Culturing Chemically Competent Bacteria, Transfecting (Lipofectamine, Electroporation), Culturing and Passaging Mammalian Cell Lines (Adherent: Immortal Fibroblasts, HuTARG, YK6, HEK293T; Suspension: CHO, HEK293, Jurkat, JeKo-1), Cell Counting (hemocytometer, Bio-Rad TC20™, Beckman Vi-Cell™), FACS (Fortessa, Symphony, Cytoflex), FACS Cell Sorting (Melody, Fusion, Aria, Astrios), Magnetic Beads Based Cell Sorting (Miltenyi MACS kits), Extraction of PBMCs from Mice Spleen, Isolation of CD4+ T cells from Blood, Expansion of Ex-Vivo Tregs, Drug and Media Preparation, Generation of Lentivirus, Transductions, Preparation of Buffers and Stock Solutions

Other: UBC Lab and BioSafety Training, TCPS2: Core Ethics Training, UBC Privacy & Information Security Fundamentals Training, PHSA WHMIS Provincial & Labels, Experience using FlowJo, Geneious, GraphPad, PyMol and Quartzy

AWARDS AND ACHIEVEMENTS

- BC Cancer Rising Star Award 2022-2024
- Elizabeth C. Watters Research Fellowship 2021-2022
- Science Scholar 2021
- Dean's Honour List 2017-2021
- Science International Student Scholarship 2018
- Summer Student Fellowship Program Scholarship 2018
- International Community Achievement Award 2017

PUBLICATIONS

- Lam, A.J., Lin, D.T.S., Gillies, J.K., **Uday, P**., Pesenacker, A.M., Kobor, M.S. and Levings, M.K. (**2021**) Optimised CRISPR-mediated gene knock-in reveals FOXP3-independent control of human Treg identity. *Cell Rep.* **36** (5), 109494
- Lam, A.J., **Uday, P.**, Gillies, J.K. and Levings, M.K. (**2021**) Helios is a marker, not a driver, of human Treg stability. *Eur J Immunol*. **52** (1), 75-84
- Lam, A.J., Haque, M., Ward-Hartstonge, K.A., **Uday, P.**, Wardell, C.M., Gillies, J.K., Speck, M., Mojibian, M., Geltink, R.I.K., and Levings, M.K. (**2021**) PTEN is required for human Treg suppression of costimulation. *Eur J Immunol*. **52** (9), 1482-1497

- Ajaykumar,A., Caloren, L., Povshedna, T., Hsieh, A.Y.Y., Zakaria, A., Cai, L., Smith, M.R., Thompson, C.A.H., Becquart, P., **Uday, P.**, Pattanshetti, R., Quandt, J.A., Wong, J.M.Y., Côté, H.C.F. (2022) Dolutegravir-containing combination antiretroviral therapy (cART) regimens reversibly induce alterations to mitochondrial health and morphology in cultured human fibroblasts and PBMC. *AIDS*. **37** (1), 19-32

CONFERENCES AND POSTER PRESENTATIONS

BIG Research Day Mar 2023 & Mar 2024

Poster Presenter (2023) & Speed Talk Presenter (2024)

- Presented the results of my PhD project, supervised by Dr. Andrew Weng from BCCRC, titled 'Altered chromatin patterning over the *IGH* locus as a pre-disposing factor to *MYC* translocations in B-cell lymphoma' in two different formats: poster (2023) and speed talk (2024)
- Practiced communicating scientific results to a multi-disciplinary audience with expertise outside my area of research
- Awarded **first place** for best speed talk amongst 21 trainees in 2024

Multi-Disciplinary Undergraduate Conference Mar 2021

Oral Presentation

- Presented a 10-minute overview of my undergraduate Honours thesis project, supervised by Dr. Megan Levings from BCCHRI, titled 'Investigating the Role of PTEN Phosphatase in the PI3K-AKT Pathway in Regulatory T cells using Genome Editing'
- Effectively communicated the impact and results of my research to a non-scientific audience

UBC 3 Minute Thesis Feb 2021

Presenter

- Presented a 3-minute elevator pitch outlining the context, results, and application of my undergraduate Honours thesis project in a UBC-wide competition
- Demonstrated the ability to communicate the importance of my research in a clinical context to a non-scientific audience

UBC Pathology Research Day 2019 May 2019

Poster Presenter

- First author on and presented a poster titled 'Effect of Postnatal Primary Infection(s) with Human Herpesviruses (HHV) on Peripheral Blood Mononuclear Cell Telomere Length, in a Ugandan Cohort of HIV-Exposed Uninfected (HEU) and HIV-Unexposed Uninfected (HUU) Children'
- Designed multivariable models on XLS Stats, in addition to basic statistical analyses, to see how different demographic variables effect our outcome variable and used GraphPad to create figures

Multi-Disciplinary Undergraduate Conference Feb 2017

Poster Presenter

- Presented a literature review titled 'Assessment of the Value of Topical Administration of Caffeine in the Treatment of Skin Cancer' and an independent research initiative on 'The Effect of Temperature on the Movement Rate of *Hemigrapsus oregonensis*'
- Focused on the impacts of our research on the larger community and emphasized on possible advancements in these areas
- Gained first-hand experience working with organisms and ensuring they were treated ethically

TEACHING & MENTORSHIP EXPERIENCE

BIOC 301 2021W T1&2, 2022W T1&2, 2023W T1&2

Teaching Assistant

- Facilitated teaching a laboratory introduction to Molecular Biology techniques by which chemical and physical properties of fundamental components of the cell were studied
- Marked 3 formal lab reports and multiple worksheets over 2 terms for 20 students
- Guided students in the lab to learn new techniques and to make efficient use of time
- Ensured students employed safe lab practices
- Hosted office hours to answer any lab report submission-related questions students may have

Fostering Science: NSERC PromoScience-funded Program 2023-2024

Mentor

- Mentored an at-risk high school student to create a Science Fair project
- Supported the student's research needs and guided them to appropriate resources
- Discussed progress and future directions during bi-weekly meetings
- Mentee successfully presented their project at the Greater Vancouver Regional Science Fair

BC Cancer Research Centre: Diversify Research Jul 2023-Aug 2023

Instructor

- Helped organize this program to promote equity and diversity in research, an initiative started through Graspods (Graduate students and Postdocs for the BC Cancer Graduate Students and Postdocs Society)
- Planned and delivered lessons to teach the basics of Cancer research to BIPOC and LGBTQIA2S+ high school students
- Helped provide technical instruction during the laboratory portion of the program with special care and consideration given to foundational knowledge and lab safety of the students

EXTRACURRICULAR ACTIVITIES

- **Co-President for Graspods** (2023-present): Leading a team of Graduate students and Postdocs for the BC Cancer Graduate Students and Postdocs Society, GrasPods. Responsibilities include planning and assisting organizing small- to large-scale academic events such as seminars and BC Cancer Research Day, managing administrative tasks, maintaining industry connections for sponsorship opportunities and supporting events that promote physical and mental health and well-being of graduate students. Facilitated panels on diversity and representation in STEM

- **Social Media Coordinator for GrasPods** (2022-2023): Responsible for managing, updating and creating engagement across multiple social media platforms (Twitter, Instagram and Facebook) and website for the BC Cancer Graduate Students and Postdocs club, GrasPods

- **Sargam UBC** (2017-present): Involved as a performer and VP of social media for club on campus that promotes Indian classical music. Assisted in organizing events of multiple scales including in-person concerts attended by 200+ people

- **Imagine Day Orientation Leader** (2017-2019): Facilitated the in-person orientation of first-year students entering the Faculty of Science on the first day of school and organized multiple events throughout the school year to help introduce students to critical resources on campus

- **UBC Junoon** (2016-2017): Involved as a performer, in addition to being the VP of Fundraising, in a competitive Bollywood Fusion dance team. Competed against teams from schools across North America

DNA translocations occur naturally at two main stages of B-cell ontogeny: the pro/pre-B-cell stage in the bone marrow as mediated by RAG1/2 recombinases, or in the mature B-cell stage in the germinal centre (GC) of secondary lymphoid organs such as lymph nodes as mediated by activation induced deaminase (AID)[1,2]. The normal function of AID is to mediate somatic hypermutation (SHM) and class-switch recombination (CSR) of the *IGH* locus which allow for antibody affinity maturation and isotype switching (e.g. IgM to IgG/A/E) to take place[1,2]. DNA point mutations and chromosomal translocations can arise when these normal processes go awry, and thus are frequent drivers of B-cell lymphomagenesis[1,2]. For instance, translocations involving *IGH* and the proto-oncogenes *MYC, BCL2, BCL6,* and *CCND1* are pathognomonic of specific subtypes of B-cell lymphomas[1,2]. Further, B-cell lymphomas that harbour a *MYC*-rearrangement within *IG* loci are associated with inferior outcomes post-chemoimmunotherapy compared to those within non-*IG* loci[3]. Targeted capture and whole genome sequencing of B-cell lymphomas such as Burkitt, follicular and diffuse large B-cell lymphomas reveal that lymphomagenic translocations involving the *IGH* and *MYC* loci bear mutational signatures that strongly suggest that they were predominantly introduced during CSR[4].

B-cell lymphomas are also enriched with loss of function (LOF) mutations in chromatin modifying genes (CMGs) such as *KMT2D* and *ARID1A*[2,5]. These genes play essential roles in the maintenance of epigenetic and chromatin stability by methylating lysine 4 on histone 3 (H3K4me) or by shuffling nucleosomes along DNA, respectively[5]. Loss of these genes leads to a complete rewiring of B-cell regulatory networks, altering B-cell function and behaviour[5]. Recent research indicates that a loss of KMT2D or ARID1A leads to B-cells arresting in a pre-CSR stage of development[6,7].

The **goal** of my project is to functionally characterize the role of LOF *KMT2D* and *ARID1A* mutations in human B-cells and their contributions to increasing the frequency of aberrant DNA translocation events. I **hypothesize** that double-stranded DNA breaks (DSBs) as introduced by AID during normal CSR in the GC are less efficiently resolved in the presence of LOF CMG mutations and thus drive illegitimate recombination events such as IGH::*MYC*. To test my hypothesis, I propose to model these LOF mutations in established B-cell lymphoma cell lines and primary human B-cells using lentiviral shRNA-mediated gene knockdown and CRISPR/Cas9-mediated gene editing. My preliminary data indicates that KMT2D or ARID1A knockdown leads to reduced CSR efficiency[8]. To investigate if this reduction in CSR corresponds to an increase in erroneous translocations, I am currently optimising a linear-amplification PCR-based assay to detect unknown 'prey' translocation partners that pair with a known 'bait', in this case the *IGH* locus[9]. In addition, I am examining the effect of these CMG mutations on the epigenetic and chromatin accessibility landscape in human B-cells via ChIP- and ATAC-seq. Changes to the epigenome can help inform underlying mechanistic perturbations that may be driving the observed CSR defect phenotype including, but not limited to, aberrant enhancer activation, increased non-specific AID activity or decreased DNA damage repair (DDR) fidelity[1,2,5,6,7]. Once key regions or elements that are differentially accessible or marked by the presence or absence of unique histone marks in diseased versus normal B-cell states are identified, mechanisms governing the preservation and ultimately, loss of translocation fidelity can be explored using CRISPR/dCas9 to selectively activate, repress, or reconfigure candidate loci[10]. We can also identify vital DDR proteins required for maintaining the balance between legitimate and illegitimate translocations by sequentially targeting them for degradation or inhibiting their enzymatic activity by using commercially available drugs, in genetically edited and unedited B-cells[11].

This work is **significant** in that by investigating how recurrently mutated CMGs may drive B-cell lymphomagenesis by altering the B-cell epigenome and normal B-cell biology, we can devise new therapeutic strategies that reverse the lymphoma-causing effects of these mutations and improve patient outcomes with effective, less toxic therapies that are based on a deeper understanding of the underlying disease biology.

References

[1] Robbiani, D.F & Nussenzweig, M.C. (2013) Chromosome Translocation, B Cell Lymphoma, and Activation-Induced Cytidine Deaminase. *Ann Rev*. **8**, 79-103

[2] Blombery, P.A, Wall, M & Seymour, J. F. (2015) The molecular pathogenesis of B-cell non-Hodgkin lymphoma. *European Journal of Hematology*. **95**, 280-293

[3] Alaggio R, Amador C, Anagnostopoulos I, *et al*. (2022) The 5th edition of the World Health Organization classification of haematolymphoid tumours: lymphoid neoplasms. *Leukemia*. 36 (**7**), 1720–1748

[4] Hilton, L., Collinge, B., Ben-Neriah, S., *et al*. (2024) Motive and Opportunity: *MYC* rearrangements in high-grade B-cell lymphoma with *MYC* and *BCL2* rearrangements-an LLMP study. *Blood.* doi: 10.1182/blood.2024024251

[5] Lunning, M.A & Green, M.R. (2015) Mutation of chromatin modifiers; an emerging hallmark of germinal center B-cell lymphomas. *Blood Cancer Journal*. **5**, e361; doi: 10.1038/bcj.2015.89

[6] Ortega-Molina, A., et al. (2015) The histone lysine methyltransferase KMT2D sustains a gene expression program that represses B cell lymphoma development. *Nat Med*. **21** (10), 1199-1208

[7] Barisic, D., et al. (2024) ARID1A orchestrates SWI/SNF-mediated sequential binding of transcription factors with ARID1A loss driving pre-memory B cell ate and lymphomagenesis. *Cancer Cell*. **42** (4)

[8] Uday, P. Weng Lab. Unpublished data

[9] Hu, J., et al. (2016) Detecting DNA double-stranded breaks in mammalian genomes by linear amplification-mediated high-throughput genome-wide translocation sequencing. Nat Protoc. 11, 853-871

[10] Pulecio, J., Verma, N., Mejia-Ramirez, E., *et al*. (2017) CRISPR/Cas9-based engineering of the epigenome. *Cell Stem Cell*. **21** (4) 431-447

[11] Pratt, G., Yap, C., Oldreive, C., *et al*. (2017) A multi-centre phase I trial of the PARP inhibitor in patients with relapsed chronic lymphocytic leukemia, T-prolymphocytic leukemia or mantle cell lymphoma. *Br J Haematol.* **182** (3), 429-433

THE UNIVERSITY OF BRITISH COLUMBIA

ACADEMIC HISTORY

ENROLMENT SERVICES
2016 - 1874 East Mall
Vancouver, BC Canada V6T 1Z1

Surname:	**Given Names:**	**Student Number:**	**Date:**
Uday	Prakruti	20895165	June 10, 2024

UBC Credentials

Bachelor of Science
Honours in Biochemistry
Co-operative Education Program
WITH DISTINCTION
Granted: May 19, 2021

Transfer Credits

2016 Winter Credits Awarded for Bachelor of Science UBC Vancouver: 18.0

International Baccalaureate 2016 Winter

UBC Vancouver 2016 Winter

BIOL	111	EX	0.0
BIOL	121	EX	0.0
BIOL	140	EX	0.0
BIOL	1st		8.0
CHEM	121		4.0
ENGL	1st		6.0

Winter Session 2016 - 2017

Bachelor of Science (UBC Vancouver) **- Year 1**

Term	Course	Credit Value	Course Title	% Grade	Letter Grade	Credit Rec'd	Stdg	Withdraw Date	Complete Date	Class Size	Class Avg
1	BIOL 112	(3.0)	Biology of the Cell	92	A+	3.0				312	83
1	BIOL 121	(3.0)	Genetics, Evolution and Ecology	78	B+	3.0				185	72
1	BIOL 140	(2.0)	Laboratory Investigations in Life Science	87	A	2.0				592	80
1	CHEM 121	(4.0)	Structure and Bonding in Chemistry	85	A	4.0				224	69
1	MATH 102	(3.0)	Differential Calculus with Applications to Life Sciences	79	B+	3.0				69	71
2	CHEM 123	(4.0)	Thermodynamics, Kinetics and Organic Chemistry	86	A	4.0				232	75
2	ENGL 112	(3.0)	Strategies for University Writing	80	A-	3.0				27	66
2	MATH 103	(3.0)	Integral Calculus with Applications to Life Sciences	90	A+	3.0				214	67
2	PHYS 101	(3.0)	Energy and Waves	83	A-	3.0				266	70
2	PSYC 101	(3.0)	Introduction to Biological and Cognitive Psychology	79	B+	3.0				316	66

Sessional Average for BSC: 83.9%

Credits Attempted	=	Passed	Failed	Withdrawn	Audited	Incomplete
31.0	=	31.0	0.0	0.0	0.0	0.0

Dean's Honour List

Winter Session 2017 - 2018

Bachelor of Science (UBC Vancouver) **- Year 2 - Honours in Biochemistry**

Term	Course	Credit Value	Course Title	% Grade	Letter Grade	Credit Rec'd	Stdg	Withdraw Date	Complete Date	Class Size	Class Avg
1	BIOL 200	(3.0)	Fundamentals of Cell Biology	90	A+	3.0				1326	76
1	BIOL 234	(3.0)	Fundamentals of Genetics	80	A-	3.0				174	71
1	CHEM 203	(4.0)	Introduction to Organic Chemistry	87	A	4.0				233	64
1	MATH 200	(3.0)	Calculus III	89	A	3.0				116	65
1	MICB 202	(3.0)	Introductory Medical Microbiology and Immunology	81	A-	3.0				288	76
2	ANTH 100A	(3.0)	Introduction to Cultural Anthropology	95	A+	3.0				189	69
2	BIOC 203	(3.0)	Fundamentals of Biochemistry	80	A-	3.0				121	74
2	CHEM 211	(4.0)	Introduction to Chemical Analysis	80	A-	4.0				154	74
2	CHEM 213	(3.0)	Organic Chemistry	87	A	3.0				220	69
2	CHEM 245	(1.0)	Intermediate Synthetic Chemistry Laboratory	82	A-	1.0				40	70

Sessional Average for BSC: 85.2%

Credits Attempted	=	Passed	Failed	Withdrawn	Audited	Incomplete
30.0	=	30.0	0.0	0.0	0.0	0.0

Dean's Honour List

UBC Academic Awards
Faculty of Science International Student Scholarship

Winter Session 2018 - 2019

Bachelor of Science (UBC Vancouver) **- Year 3 - Honours in Biochemistry**

Surname:	Given Names:	Student Number:	Date:
Uday	Prakruti	20895165	June 10, 2024

Winter Session 2018 - 2019 continued...

Term	Course	Credit Value	Course Title	% Grade	Letter Grade	Credit Rec'd	Stdg	Withdraw Date	Complete Date	Class Size	Class Avg
1	CHEM 304	(3.0)	Fundamentals of Thermodynamics and Statistical Mechanics	83	A-	3.0				157	79
1	CHEM 315	(1.0)	Chemistry Integrated Laboratory I	82	A-	1.0				25	76
1	LING 101	(3.0)	Languages of the World	88	A	3.0				179	75
1	MICB 306	(3.0)	Molecular Virology	83	A-	3.0				201	79
1-2	BIOC 301	(3.0)	Biochemistry Laboratory	85	A	3.0				152	82
1-2	BIOC 303	(6.0)	Molecular Biochemistry	87	A	6.0				130	73
2	BIOC 304	(3.0)	Contemporary Biochemical Research	90	A+	3.0				110	78
2	BIOL 335	(3.0)	Molecular Genetics	80	A-	3.0				169	69
2	CHEM 313	(3.0)	Advanced Organic Chemistry for the Life Sciences	87	A	3.0				139	68
2	CHEM 335	(1.0)	Chemistry Integrated Laboratory II	83	A-	1.0				21	76
2	CRWR 200	(3.0)	Introduction to Creative Writing	84	A-	3.0				190	75

Sessional Average for BSC: 85.2%

Credits Attempted	=	Passed	Failed	Withdrawn	Audited	Incomplete
32.0	=	32.0	0.0	0.0	0.0	0.0

Dean's Honour List

Summer Session 2019

Bachelor of Science (UBC Vancouver) **- Year 3 -**
Honours in Biochemistry

Term	Course	Credit Value	Course Title	% Grade	Letter Grade	Credit Rec'd	Stdg	Withdraw Date	Complete Date	Class Size	Class Avg
1-2	BIOC 398	(3.0)	Internship Work Placement I			3.0	P				

Sessional Average for BSC:

Credits Attempted	=	Passed	Failed	Withdrawn	Audited	Incomplete
3.0	=	3.0	0.0	0.0	0.0	0.0

Winter Session 2019 - 2020

As of 16 March 2020, the COVID-19 pandemic disrupted regular academic activities. Modes of instruction and assessment were shifted to on-line activities mid-term, including changes to exam practices and weighting in some cases. Deadlines to withdraw or change to Credit/D/Fail or Pass/Fail grading were extended by some programs.

Bachelor of Science (UBC Vancouver) **- Year 4 -**
Honours in Biochemistry

Term	Course	Credit Value	Course Title	% Grade	Letter Grade	Credit Rec'd	Stdg	Withdraw Date	Complete Date	Class Size	Class Avg
1	BIOC 399	(3.0)	Internship Work Placement II			3.0	P				
2	BIOC 498	(3.0)	Internship Work Placement III			3.0	P				

Sessional Average for BSC:

Credits Attempted	=	Passed	Failed	Withdrawn	Audited	Incomplete
6.0	=	6.0	0.0	0.0	0.0	0.0

Summer Session 2020

Bachelor of Science (UBC Vancouver) **- Year 4 -**
Honours in Biochemistry

Term	Course	Credit Value	Course Title	% Grade	Letter Grade	Credit Rec'd	Stdg	Withdraw Date	Complete Date	Class Size	Class Avg
1-2	BIOC 499	(3.0)	Internship Work Placement IV			3.0	P				

Sessional Average for BSC:

Credits Attempted	=	Passed	Failed	Withdrawn	Audited	Incomplete
3.0	=	3.0	0.0	0.0	0.0	0.0

Winter Session 2020 - 2021

Bachelor of Science (UBC Vancouver) **- Year 4 -**
Honours in Biochemistry

Term	Course	Credit Value	Course Title	% Grade	Letter Grade	Credit Rec'd	Stdg	Withdraw Date	Complete Date	Class Size	Class Avg
1	BIOC 402	(3.0)	Proteins: Structure and Function	91	A+	3.0				149	77
1	BIOC 410	(3.0)	Nucleic Acids-Structure and Function	86	A	3.0				130	78
1	BIOC 420	(3.0)	Advanced Biochemical Techniques	92	A+	3.0				24	88
1-2	BIOC 404	(3.0)	Biochemical Methods	90	A+	3.0				25	85
1-2	BIOC 449C	(6.0)	Honours Thesis	93	A+	6.0				19	92

Surname:	Given Names:	Student Number:	Date:
Uday	Prakruti	20895165	June 10, 2024

Winter Session 2020 - 2021 continued...

Term	Course	Credit Value	Course Title	% Grade	Letter Grade	Credit Rec'd	Stdg	Withdraw Date	Complete Date	Class Size	Class Avg
2	BIOC 440	(3.0)	Concepts in Molecular Biology	89	A	3.0				20	83
2	BIOC 460	(3.0)	Advanced Techniques in Biochemistry	89	A	3.0				26	85
2	BIOL 300	(3.0)	Fundamentals of Biostatistics	93	A+	3.0				260	80
2	CPSC 103	(3.0)	Introduction to Systematic Program Design	96	A+	3.0				230	78

Sessional Average for BSC: 91.2%

Credits Attempted	=	Passed	Failed	Withdrawn	Audited	Incomplete
30.0	=	30.0	0.0	0.0	0.0	0.0

Science Scholar - Dean's Honour List

Winter Session 2021 - 2022

Master of Science (UBC Vancouver) -
In Interdisciplinary Oncology

Term	Course	Credit Value	Course Title	% Grade	Letter Grade	Credit Rec'd	Stdg	Withdraw Date	Complete Date	Class Size	Class Avg
1	MICB 507	(3.0)	Topics in Molecular Pathogenesis and Immunology	95	A+	3.0				11	95
1	ONCO 502	(3.0)	Concepts in Oncology	97	A+	3.0				27	90
1-2	ONCO 510	(3.0)	Seminars in Oncology				T				
1-2	ONCO 549	(12.0)	Master of Science Thesis				T				
2	MEDG 505	(3.0)	Genome Analysis	98	A+	3.0				18	92
2	MEDG 521	(3.0)	Molecular and Cell Biology of Cancer	96	A+	3.0				22	91
2	MEDG 535	(3.0)	Genetics and Ethics	89	A	3.0				12	90

Sessional Average for MSC: 95.0%

Credits Attempted	=	Passed	Failed	Withdrawn	Audited	Incomplete
30.0	=	15.0	0.0	0.0	0.0	15.0

UBC Academic Awards
Elizabeth C. Watters Research Fellowship
Faculty of Medicine Graduate Award

Summer Session 2022

Master of Science (UBC Vancouver), Registration Continuing -
In Interdisciplinary Oncology

Term	Course	Credit Value	Course Title	% Grade	Letter Grade	Credit Rec'd	Stdg	Withdraw Date	Complete Date	Class Size	Class Avg
1	ONCO 549	(12.0)	Master of Science Thesis				T				

Sessional Average for MSC:

Credits Attempted	=	Passed	Failed	Withdrawn	Audited	Incomplete
12.0	=	0.0	0.0	0.0	0.0	12.0

Winter Session 2022 - 2023

Master of Science (UBC Vancouver) -
In Interdisciplinary Oncology

Term	Course	Credit Value	Course Title	% Grade	Letter Grade	Credit Rec'd	Stdg	Withdraw Date	Complete Date	Class Size	Class Avg
1-2	ONCO 510	(3.0)	Seminars in Oncology				T				
1-2	ONCO 549	(12.0)	Master of Science Thesis				T				

Sessional Average for MSC:

Credits Attempted	=	Passed	Failed	Withdrawn	Audited	Incomplete
15.0	=	0.0	0.0	0.0	0.0	15.0

Transferred to PhD

Summer Session 2023

Doctor of Philosophy (UBC Vancouver) -
In Interdisciplinary Oncology

Term	Course	Credit Value	Course Title	% Grade	Letter Grade	Credit Rec'd	Stdg	Withdraw Date	Complete Date	Class Size	Class Avg
1-2	ONCO 649	(0.0)	Doctoral Dissertation				T				

Sessional Average for PHD:

Credits Attempted	=	Passed	Failed	Withdrawn	Audited	Incomplete
0.0	=	0.0	0.0	0.0	0.0	0.0

Admitted to Candidacy on July 5, 2023

THE UNIVERSITY OF BRITISH COLUMBIA

ACADEMIC HISTORY

ENROLMENT SERVICES
2016 - 1874 East Mall
Vancouver, BC Canada V6T 1Z1

Surname:	Given Names:	Student Number:	Date:
Uday	Prakruti	20895165	June 10, 2024

Winter Session 2023 - 2024

Doctor of Philosophy (UBC Vancouver) -
In Interdisciplinary Oncology

Term	Course	Credit Value	Course Title	% Grade	Letter Grade	Credit Rec'd	Stdg	Withdraw Date	Complete Date	Class Size	Avg
1-2	ONCO 510	(3.0)	Seminars in Oncology				T				
1-2	ONCO 649	(0.0)	Doctoral Dissertation				T				

Sessional Average for PHD:

Credits Attempted	=	Passed	Failed	Withdrawn	Audited	Incomplete
3.0	=	0.0	0.0	0.0	0.0	3.0

UBC Academic Awards
Faculty of Medicine Graduate Award

Summer Session 2024

Doctor of Philosophy (UBC Vancouver) -
In Interdisciplinary Oncology

Term	Course	Credit Value	Course Title	% Grade	Letter Grade	Credit Rec'd	Stdg	Withdraw Date	Complete Date	Class Size	Avg
1-2	ONCO 649	(0.0)	Doctoral Dissertation				CIP				

Sessional Average for PHD:

Credits Attempted	=	Passed	Failed	Withdrawn	Audited	Incomplete
0.0	=	0.0	0.0	0.0	0.0	0.0

********** End of Record **********

BC Children's Hospital
An agency of the Provincial Health Services Authority

Childhood Diseases Research Theme
BC Children's Hospital Research Institute
950 West 28th Avenue, Vancouver, B.C. V5Z 4H4
t 604.875.3194 f 604.875.2496
www.bcchr.ca

May 14, 2024

Re: Letter of reference for Prakruti Uday

To whom it may concern,

It is my pleasure to recommend Prakruti Uday for a UBC 4YF award. I came to know Prakruti when she joined my lab as an undergraduate co-op student in Jan 2020. Needless to say, her co-op term was significantly affected by the COVID19 pandemic, but she was nevertheless able to demonstrate her dedication and interest in research and we were pleased to allow her to continue to work in the lab as an honours thesis student from Sep 2020 to April 2021. Over the 16 months in my lab Prakruti proved to be an exceptional undergraduate student. She is self-motivated, hard-working and focused on continuing a career in research.

Prakruti is a curious, self-motivated learner. Early on, she found and read papers related to her project, and continued doing so without prompting for her final co-op presentation and for writing the introduction of her undergraduate thesis. Both her presentation and thesis introduction showed a solid understanding of the scientific background and rationale leading up to her ongoing research. During the 3-month lab shutdown in the COVID-19 pandemic, she attended webinars and read the literature on topics of her own personal interest, from cancer biology to telomere aging to immunology. Notably, she also taught herself the R programming language using resources available online, practiced by analyzing an existing RNA-seq dataset from the lab, and leveraged her new skills to write an R script for a senior lab member to generate multiple graphs from raw data in an automated fashion. She consistently demonstrated initiative throughout her time in my lab. For example, as a thesis student, she found her own opportunities to partake in, including submitting an abstract to a university-wide undergraduate research conference and participating in an undergraduate 3-minute thesis heat.

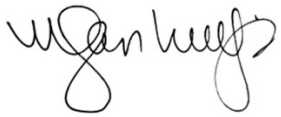
During her time in my lab, Prakruti honed a variety of technical and critical thinking skills. She became proficient in many in vitro cell-based techniques, such as immune cell isolation from human blood; T cell culture and expansion; multi-parameter flow cytometry panel design and analysis; and CRISPR editing in T cells. During this work Prakruti showed attention to detail and robust record-keeping. Beyond this, she always sought to understand the foundations of experimental design—asking insightful questions about the selection of controls, alternative hypotheses and outcomes, and approaches to data analysis and visualization. Using this critical thinking, she successfully optimized antibody-based protein detection and signal transduction in gene-knockout cell lines in a series of experiments she designed.

Prakruti has also displayed excellent oral communication skills, which have further highlighted her emphasis on scientific thinking. At the end of her co-op term, Prakruti delivered an outstanding presentation on her research progress. Well-paced and lucidly presented, she gave appropriate focus to each topic, followed a logical structure, and presented sufficient relevant information to give context for each section. Her thoughtful data interpretation, proposed future directions, and answers to questions from lab members revealed a greater understanding of her work's implications and limitations. Her honours similarly showed that she thinks deeply about the scientific foundations of her research.

Finally, Prakruti is industrious, reliable, and organized. In the lab, she has always come prepared, willing to help others whenever needed. During her co-op term, she planned, executed, and analysed experiments within a reasonable timeframe. During her honours thesis, she set an ambitious schedule for herself to complete her thesis in sections well in advance, and was able to meet these own deadlines. She has managed to balance lab work and coursework—and her efforts have shown in her excellent academic record throughout her undergraduate career.

Overall I would highly recommend Prakruti for a 4YF award. She has both the academic record and research potential that will enable her to succeed in a research intensive career.

Sincerely,



Dr. Megan Levings
Professor, Department of Surgery &
School of Biomedical Engineering
University of British Columbia
Lead, Childhood Diseases Research
BC Children's Hospital Research Institute

May 23, 2024

RE: UDAY, Prakruti

Dear Members of the Selection Committee,

It is with great pleasure that I write this letter of support for Prakruti Uday in her application for a UBC Four Year Doctoral Fellowship (4YF) award. I have served as the primary supervisor for 16 graduate students over the past 20 years in my lab, and in the past few years during which Prakruti has been in my lab, I have been and continue to be genuinely impressed by her quick grasp of complex scientific concepts, independence in seeking out and distilling information from other members of the lab and from published literature, and initiative in designing and executing her own experiments.

Prakruti has demonstrated exemplary performance in traditional didactic learning, as evidenced by her undergraduate academic record with Honors in Biochemistry and recognition by the Dean's Honor List (all 4 years) and as a named Science Scholar in 2021. During her undergraduate tenure, she received 3 awards: the UBC International Community Achievement award in 2016, a UBC Faculty of Science International Student Scholarship in 2016, and a UBC Pathology summer student fellowship in 2018. During her graduate tenure, thus far she has received an Elizabeth C. Watters 1-year research fellowship in lymphatic cancer in 2021, and a BC Cancer Rising Stars 2-year award in 2022. These many awards attest strongly to Prakruti's consistent academic and research progress.

Prakruti did not limit her undergraduate experiences to the classroom setting. She also accumulated an impressive repertoire of hands-on laboratory experiences including volunteer positions in three different labs and Co-op terms in both academic and biopharmaceutical industry settings. It was through these real-life laboratory experiences that Prakruti gained her appreciation for the elegance and biological importance of the immune system, and thus developed her passion for studying it and its dysregulation in lymphoid cancers. Prakruti's important contributions to projects that she participated in outside of the classroom are evidenced by her authorship on peer-reviewed manuscripts published Cell Reports and the European Journal of Immunology in 2021. These experiences propelled her to apply for a position in my lab for her graduate studies, and her initial email to me grabbed by interest immediately as besides her obvious accomplishments, the consistent direction, progress, and scope of her work clearly indicated to me that she was a standout in terms of her personal drive, ambition, and initiative.

With junior trainees in my lab, typically a path of experimentation must be laid out explicitly and paired with a gentle introduction of the underlying concepts and essentially a "slow walk" to

675 West 10th Avenue
Vancouver, BC, Canada V5Z 1L3
Tel: 604.675.8120
Fax: 604.877.0712

explain the goals of the work as they unfold. But Prakruti is not a typical trainee by any stretch. After I explained in general terms that I wanted to look at the impact of frequently mutated chromatin modifying genes on IGH locus accessibility during class switch recombination in human B-cells and the potential contribution of this process when dysregulated to lymphomagenesis, Prakruti came back to my office the next week to point out 3 papers in which she found a parallel experimental system in mice that we could adapt to our human context as well as a new NGS-based technique that we could apply to score both legitimate (known) and illegitimate (unknown) rearrangement partners. I had some reservations about the latter as it was a new technique reported by a single lab and here was a junior grad student saying she wanted to try it. Fast-forward a year and a half later, and Prakuti has generated CRISPR/Cas9-edited single cell cloned human cell lines as well as designed and tested feasibility of the NGS assay in her own hands. As a testament of her independence and individual initiative, she has had to explain to me each time exactly how the NGS assay works – which is to say she is leading me rather than me leading her on this project. This is indeed a very unique situation that I have to admit I am enjoying immensely. I am invigorated each time we meet (even thought they can last 2 hours at a time) and her enthusiasm combined with dogged persistence reminds me as exactly why I went into science myself in the first place – the sheer joy of discovery and excitement that comes from exploring uncharted territory yet paired with good old-fashioned hard work that is its own reward.

Prakruti doesn't just impress me – she has a similar effect on other PIs as well. We had a site visit for our TFRI Program Project Grant last year and of course I asked that Prakruti participate as the trainee for my individual project despite that fact that her work to date was related to, but not actually one of the proposed project aims. This is a daunting ask for a junior trainee – to stand and be grilled by an external reviewer where a $7.5M grant is on the line. I heard back later that two of the reviewers spent nearly their entire allotted time speaking with Prakruti as they were enrapt by her maturity, depth of understanding yet transparent communication skills, and most notably, her genuine excitement for the work.

In the lab itself, Prakruti is a natural leader in both setting an example of commitment to her work but also in creating a collegial and inclusive atmosphere. We have a "lab social" Slack channel and Prakruti initiates more than her fair share of invites for lab mates to join up for gatherings after work and on the weekend for events like hot chocolate tasting expeditions (apparently there is a yearly hot chocolate festival that visits Vancouver) and games night a pizza joint near Olympic Village. Besides just having fun, these whole lab activities build a sense of camaraderie and esprit des corps that engages everyone socially, and as a result, scientifically. I would be hard pressed to recall another person in my 20 years of running a lab that has done more for the lab than Prakruti has in terms of building a healthy and engaging community.

In summary, by all measures Prakruti exhibits an uncommon maturity in scientific discourse. The combination of her experience thus far, intellectual capacity, and natural curiosity, paired

675 West 10th Avenue
Vancouver, BC, Canada V5Z 1L3

Tel: 604.675.8120
Fax: 604.877.0712

with her exacting attention to detail and dogged persistence in my mind identifies her as an exceptionally strong candidate with potential to make substantial contributions in the area of cancer biology. Given these qualities, I feel Prakruti would be an ideal and deserving recipient for a Four Year Fellowship, and this investment, if proffered, will yield meaningful and impactful scientific returns many times over.

Sincerely,

Andrew P. Weng, MD, PhD
Professor of Pathology & Laboratory Medicine, University of British Columbia
Distinguished Scientist, Terry Fox Laboratory, BC Cancer Agency
Hematopathologist, Dept of Pathology, BC Cancer Agency
E-mail: aweng@bccrc.ca
Phone: 604-675-8136

675 West 10th Avenue
Vancouver, BC, Canada V5Z 1L3

Tel: 604.675.8120
Fax: 604.877.0712