

Himal Shrestha

PHD STUDENT

La Trobe University

✉ H.Shrestha@latrobe.edu.au | 🏠 himal2007.netlify.app | ☎ 0000-0002-4470-4830 | 📷 himal2007 | 🌐 himal-shrestha

I am a PhD student in Bioinformatics at La Trobe University studying the transmission of a parasitic disease called River Blindness. I utilize different computational and mathematical approaches to integrate genomic, environmental and epidemiological data to predict, prevent and eliminate both infectious and non-infectious diseases. I am equally adept at different molecular and laboratory techniques.

Education

PhD in Bioinformatics

LA TROBE UNIVERSITY

Melbourne, Australia

2019-2022(expected)

- Project: Geospatial modelling of onchocerciasis transmission.

Master of Biotechnology and Bioinformatics

LA TROBE UNIVERSITY

Melbourne, Australia

2017-2019

- Thesis: Analysis of ivermectin action on adult female *Onchocerca volvulus* from embryogram data: evidence for reproductive periodicity and the basis for the embryostatic phenotype.

Bachelor of Science in Human Biology

KATHMANDU UNIVERSITY

Dhulikhel, Nepal

2012-2016

- Thesis: Assessment of C-Reactive Protein/Albumin ratio for predicting outcome in critically ill patients with various underlying diseases.

Skills

COMPUTATIONAL SKILLS

- Programming languages: R, Python, MATLAB, Bash, Julia, javascript and C
- GIS softwares: Earth Engine, QGIS
- Markup and version control: LaTeX, Markdown, RMarkdown, CSV, JSON, YAML, Git, VSCode
- Bioinformatics databases: NCBI, UniProt, EMBL-EBI, DDBJ, Wormbase and Vectorbase
- Miscellaneous: High Performance Computing Clusters, SPSS, Origin, Microsoft packages

WET LAB SKILLS

- Samples: Clinical (blood, sputum, urine), microbiological (bacteria, fungus) and molecular samples (protein, RNA, plasmid and DNA)
- Molecular techniques: DNA and plasmid extraction, Gel Electrophoresis, SDS PAGE, ELISA, Cloning with restriction endonuclease, Primer Design for PCR, Protein separation with IMAC
- Instruments: Spectrophotometer, Centrifuge, PCR thermal cycler, water bath, incubators and autoclaves

ORGANIZATIONAL SKILLS

- Active committee member: PAM-HDR, COMBINE-AU
- Initiated undergraduate student club, One Class One Community (OCOC) with approximately 200 members
- Organized Blood Donation Campaign, Health Camp, Menstrual Hygiene program during undergraduate
- Experience of working with diverse group of people

COMMUNICATION SKILLS

- Verbal: presentations in seminar, conferences, teaching and co-host of a podcast, Science ka Kura
- Written: journal articles, thesis, newsletters at PAM-HDR and report writing

Research experience

PhD research (Bioinformatics/Infectious disease modelling)

LA TROBE UNIVERSITY

Melbourne, Australia

Aug, 2019- Nov, 2022(expected)

- Analysis of genomic, environmental and epidemiological data to build geospatially explicit models for understanding parasitic disease transmission.

Research assistant

LA TROBE UNIVERSITY

Melbourne, Australia

Jul-Aug, 2019

- Performed analysis of embryogram and skin snip data of female *Onchocerca volvulus* parasite
- Assisted in analysis of genomic data generated in the lab

Master's research

LA TROBE UNIVERSITY

- Studying effect of ivermectin on reproduction of *Onchocerca volvulus*.

Melbourne, Australia

Jul, 2018-Jun, 2019

Undergraduate research

DHULIKHEL (KATHMANDU UNIVERSITY) HOSPITAL

- Assessment of C-Reactive Protein/Albumin ratio in critically ill patients

Dhulikhel, Nepal

Feb-Oct, 2016

Research assistant (Volunteer)

KATHMANDU UNIVERSITY

- 2014-2016: Studied effect of non-thermal plasma on microbes and biomolecules (Plasma Physics Laboratory)
- Nov, 2015: Post-Earthquake Trauma and Social Identity Survey
- Oct, 2014: Community Arthritis Screening Program (National center for Rheumatic diseases)

Dhulikhel, Nepal

2014-2016

Teaching experience

Instructor

AUSTRALIAN COMPUTATIONAL BIOLOGY AND BIOINFORMATICS STUDENT SOCIETY

- 13 and 15 Apr, 2021: Introduction to R and Data Visualisation Workshop
- 4 and 5 May, 2021: Introduction to Python

combine.org.au

Feb, 2021-Ongoing

Casual academic

LA TROBE UNIVERSITY

- BIO5INF (Bioinformatics)
- BIO1MGC (Molecules, Genes and Cells)
- BIO1EEB (Ecology, Evolution and Biodiversity)

Melbourne, Australia

Feb, 2020-Ongoing

La Trobe Outreach Demonstrator

LA TROBE UNIVERSITY

- Bytesize Bioinformatics

Melbourne, Australia

Jan, 2020

Lecturer

PURBANCHAL UNIVERSITY

- Anatomy and Physiology
- Pharmacology and Toxicology

Bhaktapur, Nepal

Jan-Jun, 2017

Volunteering experience

TREASURER

- Jan, 2022- Ongoing: Australian Computational Biology and Bioinformatics Student Society (COMBINE-AU)

EXECUTIVE COMMITTEE MEMBER

- Jan, 2020- Dec, 2021: Australian Computational Biology and Bioinformatics Student Society (COMBINE-AU)
- Jan-Dec, 2020: Physiology, Anatomy and Microbiology-High Degree Research (PAM-HDR) Student Society
- 2013-2014: Kathmandu University Youth Red Cross Circle (KUYRCC)

VOLUNTEER

- Feb, 2018: International Student Host at International Student Services, La Trobe University
- Sep, 2017: Fund raising event by Olivia Newton - John Cancer Research Centre
- Nov, 2016: Fifth Conference of South Asian Association of Physiologists
- Apr, 2014: Program Coordinator in One Day Health Camp (Red Cross Circle)

Awards

ASTMH Young Investigator Award (First-tier Mention)

AMERICAN SOCIETY OF TROPICAL MEDICINE & HYGIENE

Seattle, Washington, United States

2022

ASTMH annual meeting travel award

AMERICAN SOCIETY OF TROPICAL MEDICINE & HYGIENE

Seattle, Washington, United States

2022

SABE HDR student research support award

LA TROBE UNIVERSITY

Melbourne, Australia

2022

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| The Jenny Graves Prize for best student short presentation | <i>ComBio22, Melbourne, Australia</i> |
| GENETICS SOCIETY OF AUSTRALASIA | 2022 |
| LTU Full Fee Research Scholarship (LTUFFRS) Award | <i>Melbourne, Australia</i> |
| LA TROBE UNIVERSITY | 2019-Ongoing |
| LTU Postgraduate Research Scholarship (LTUPRS) Award | <i>Melbourne, Australia</i> |
| LA TROBE UNIVERSITY | 2019-Ongoing |
| Australian Society of Parasitologists (ASP) student travel grant | <i>Adelaide, Australia</i> |
| AUSTRALIAN SOCIETY OF PARASITOLOGY | 2019 |
| Pro Vice Chancellor's Commendation 2018 | <i>Melbourne, Australia</i> |
| LA TROBE UNIVERSITY | 2019-Ongoing |
| Diversity Scholarship: Technical Deep Learning Workshop | <i>Melbourne, Australia</i> |
| BRANESHOP | 2019 |
| Research Poster Excellence Award | <i>Melbourne, Australia</i> |
| MASTER'S POSTER SESSION (LA TROBE UNIVERSITY) | 2019 |
| Supporting an Outstanding Student Experience by Student Hosts | <i>Melbourne, Australia</i> |
| INTERNATIONAL STUDENT SERVICES, LA TROBE UNIVERSITY | 2018 |
| La Trobe College Excellence Scholarship | <i>Melbourne, Australia</i> |
| LA TROBE UNIVERSITY | 2017-2019 |
| Merit based Scholarship | <i>Dhulikhel, Nepal</i> |
| KATHMANDU UNIVERSITY | 2013-2016 |
| Award for the top achieving student | <i>Pokhara, Nepal</i> |
| GANDAKI HIGHER SECONDARY BOARDING SCHOOL | 2012 |
| Award for the highest performing student | <i>Nepal</i> |
| DISTRICT EDUCATION OFFICE, MINISTRY OF EDUCATION, GOVERNMENT OF NEPAL | 2008 |

Research grants

Co-investigator/Sub-awardee

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| UNICEF/UNDP/World Bank/WHO SPECIAL PROGRAMME FOR RESEARCH AND TRAINING IN TROPICAL DISEASES (TDR/WHO) | 2021-2022 |
| (US\$108,000) | |
| • Population genetic tools for onchocerciasis control programmes to determine transmission zones. | |

Trainings and workshops attended

PROGRAMMING AND MODELLING WORKSHOPS

- Aug 17-18, 2022: HPC201: Getting started with HPC using PBS Pro (Virtual), Intersect
- Apr 4 2022: 1-Day Introduction to AMD GPUs (AMD Instinct Architecture and ROCm) (Virtual), Pawsey Supercomputing Centre
- Oct 27-28, 2021: AWS GIS workshop for online cloud genomics (Virtual), Genome Institute of Singapore and Amazon Web Services
- Jun 28, Jul 09, 2021: Data-Driven Modelling in Mathematical Biology (Virtual), MATRIX and AMSI
- Jun 28 - Jul 02, 2021: Helminth Bioinformatics - Asia (Virtual), Wellcome Connecting Science
- Nov 02-06, 2020: Hierarchical Modelling of Species Communities with the R-package Hmsc (virtual), University of Helsinki, Finland
- Sep 16, 2019: COMBINE R package development workshop, COMBINE-AU, Walter and Eliza Hall Institute, Melbourne, Australia
- Aug 08 - Sep 12, 2019: 6-Week Technical Deep Learning Workshop, Braneshop, Bluerock, Melbourne, Australia
- Feb 04-08, 2019: Mplus course on Structural Equation Modelling (SEM) and Multilevel Modelling (MLM), University of Melbourne, Melbourne, Australia
- Dec 14, 2018: G*Power Workshop, La Trobe University, Melbourne, Australia
- Feb 25, 2017: Data analysis using Python, IT Training-Nepal, Kathmandu, Nepal

CONFERENCES

- Jun 07-09, 2021: Genomic Epidemiology of Malaria (Virtual), Wellcome Connecting Science
- Jul 22-26, 2020: ISEC2020 International Statistical Ecology Conference (Virtual), Statistics in Ecology, Environment and Conservation, Sydney, Australia
- Jun 8-12 2020: Advancing knowledge about spatial modelling, infectious diseases, environment and health (Virtual), Fields Institute for Research in Mathematical Sciences, Toronto, Canada
- Mar 13-15, 2017: Regional workshop on Zoonotic Diseases Pandemic Preparedness for South Asia Using One Health Platform, Centre for Molecular Dynamics-Nepal, Kathmandu, Nepal

SUMMER SCHOOL

- Jan 06-31, 2020: Dynamic processes spreading on Networks, La Trobe University, Australia
- Jan 06-31, 2020: Random Fields: Mathematical theory and application in spatial statistics, La Trobe University, Australia

MISCELLANEOUS WORKSHOPS

- Aug 01, 2017: Working with recombinant DNA, La Trobe University, Melbourne, Australia
- Mar 21, 2016: One Day Seminar on Intellectual Property Rights, Kathmandu University, Dhulikhel, Nepal

Publications

JOURNAL PUBLICATIONS (PEER REVIEWED)

- **Shrestha H**, McCulloch K, Hedtke SM, Grant WN. Geospatial modeling of pre-intervention nodule prevalence of *Onchocerca volvulus* in Ethiopia as an aid to onchocerciasis elimination. Cotton J, editor. PLoS Negl Trop Dis. 2022 Jul 18;16(7):e0010620.
- Gyawali P, Tamrakar D, Shrestha A, **Shrestha H**, Karmacharya S, Bhattarai S, et al. Consumer acceptance and preference for brown rice-A mixed-method qualitative study from Nepal. Food Sci Nutr. 2022 Mar 4;fsn3.2803.
- Gyawali P, **Shrestha H**, Pant V, Rimal P, Gautam S. C-reactive Protein to Albumin Ratio among Patients Admitted to Intensive Care Unit of a Tertiary Care Hospital: A Descriptive Crosssectional Study. J Nepal Med Assoc. 2021 Dec 11;59(244):1247-51.
- R Shrestha, DP Subedi, S Adhikari, A Maharjan, **H Shrestha**, GR Pandey (2017). Experimental Study of Atmospheric Pressure Argon Plasma Jet-Induced Strand Breakage in Large DNA Molecules, Plasma Medicine, vol. 7, no. 1. doi:10.1615/PlasmaMed.2017019986
- J Shrestha Manandhar, R Shrestha, N Basnet, P Silwal, **H Shrestha**, A Rimal, D Kunwar (2017). Study of Adherence Pattern of Antidepressants in Patients with Depression, Kathmandu University Medical Journal (KUMJ), vol. 15, no. 57, pp: 3-9. PMID: 29446354
- JTM Shrestha, **H Shrestha**, M Prajapati, A Karkee, A Maharjan (2017). Adverse Effects of Oral Hypoglycemic Agents and Adherence to them among Patients with Type 2 Diabetes Mellitus in Nepal, Journal of Lumbini Medical College, vol. 5, no. 1, pp. 34-40. doi:10.22502/jlmc.v5i1.126

CONFERENCE ABSTRACTS

- **H Shrestha**, K McCulloch, SM Hedtke, WN Grant (2021). Geospatial modeling of the baseline *Onchocerca volvulus* nodule prevalence in Ethiopia as an aid to elimination. Poster presentation at ASTMH 2022 Annual Meeting, Seattle Convention Center, United States, 30 Oct - 3 Nov, 2022.
- **H Shrestha**, SM Hedtke, RH Chisholm, WN Grant (2021). Landscape genetics and persistence of Onchocerciasis transmission in Ghana. Lightning talk at ComBio22, Melbourne Convention and Exhibition Centre (MCEC), 27-30 Sep, 2022.
- **H Shrestha**, K McCulloch, SM Hedtke, WN Grant (2021). Landscape genetics to determine factors for ongoing transmission of onchocerciasis in the transition region of Ghana. Science bite talk at PAM HDR Research Symposium 2021 held online on December 15, 2021.
- **H Shrestha**, SM Hedtke, K McCulloch, WN Grant (2021). Landscape genetics to determine factors for ongoing transmission of onchocerciasis in the transition region of Ghana. Oral presentation (15 mins) at COMBINE Student Symposium (Virtual), Nov 22, 2021.
- **H Shrestha**, K McCulloch, SM Hedtke, SM Feleke, WN Grant (2021). Geospatial analysis of pre-intervention prevalence of onchocerciasis in Ethiopia. Australian Society of Parasitology Online Conference (Virtual). Jun 23-25, 2021.
- **H Shrestha**, K McCulloch, SM Hedtke, WN Grant (2021). Geospatial mapping of onchocerciasis prevalence in Ethiopia. Spatial and Temporal Statistics Symposium (STSS), University of Wollongong (Virtual), February 17-19, 2021.
- **H Shrestha**, SM Hedtke, K McCulloch, WN Grant (2020). Identifying spatial patterns of onchocerciasis transmission using landscape analysis. Science bite talk at PAM Research Symposium 2020 held online on December 10 and 11, 2020.
- WN Grant, SM Hedtke, K McCulloch, S Wanji, **H Shrestha** (2020). Elucidating ivermectin's action on reproduction of adult female *Onchocerca volvulus* from embryogram data: the basis for the embryostatic phenotype and sub-optimal response. Anthelmintics: Discovery to Resistance IV, Los Angeles, California, February 3-7, 2020
- **H Shrestha** (2019). Elucidating ivermectin's action on reproduction of adult female *Onchocerca volvulus* from embryogram data: the basis for the embryostatic phenotype. PRISM2 Annual Conference, Woodward Conference Centre, Carlton, Victoria, November 12-13, 2019.
- W Grant, S Hedtke, S Wanji, **H Shrestha** (2019). Ivermectin and fertility in nematodes. The second Australian *C. elegans* Symposium (ACES, 2019), Queensland Brain Institute, The University of Queensland, Brisbane, Queensland, October 23-25, 2019.
- **H Shrestha**, SM Hedtke, K McCulloch, S Wanji, WN Grant (2019). Effect of ivermectin treatment on adult female *Onchocerca volvulus* from embryogram data: evidence for periodicity of reproduction and the basis for the embryostatic phenotype. Oral presentation (15 mins) at annual meeting of Australian Society for Parasitology, Adelaide Convention Centre, South Australia, July 8-11, 2019.
- S Gautam, P Gyawali, J Singh, **H Shrestha** (2016). Assessment of C-Reactive Protein/Albumin Ratio in Critically Ill Patients with Various Underlying Diseases. Poster presentation at Second Annual Scientific Meeting (NACC-CON 2016) at Dhulikhel Hospital Kathmandu University Hospital, Nepal, August 20-21, 2016.
- A Maharjan, **H Shrestha**, S Shrestha (2016). Prevalence of Rheumatic Symptoms in Urban Population of Kathmandu Valley. Poster presentation at 7th National Conference on Science and Technology, Kathmandu, Nepal, March 29-31, 2016.
- **H Shrestha**, A Maharjan, S Shrestha (2016). Attitudes Towards Menstruation of Pre-menstruating Adolescent School Girls. Poster presentation at 7th National Conference on Science and Technology, Kathmandu, Nepal, March 29-31, 2016.