

# Himal Shrestha

PHD STUDENT

La Trobe University

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*I am a PhD student in Bioinformatics at La Trobe University studying the transmission of infectious diseases. I utilize different computational and mathematical approaches to integrate genomic, environmental and epidemiological data to predict, prevent and eliminate 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 (<https://anchor.fm/sciencekakura>)
- 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

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### 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

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### EXECUTIVE COMMITTEE MEMBER

- Jan, 2020 - Ongoing: 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

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### LTU Full Fee Research Scholarship (LTUFFRS) Award

LA TROBE UNIVERSITY

Melbourne, Australia

2019-Ongoing

### LTU Postgraduate Research Scholarship (LTUPRS) Award

LA TROBE UNIVERSITY

Melbourne, Australia

2019-Ongoing

### Australian Society of Parasitologists (ASP) student travel grant

AUSTRALIAN SOCIETY OF PARASITOLOGY

Adelaide, Australia

2019

### Pro Vice Chancellor's Commendation 2018

LA TROBE UNIVERSITY

Melbourne, Australia

2019-Ongoing

<b>Diversity Scholarship: Technical Deep Learning Workshop</b> BRANESHOP	Melbourne, Australia 2019
<b>Research Poster Excellence Award</b> MASTER'S POSTER SESSION (LA TROBE UNIVERSITY)	Melbourne, Australia 2019
<b>Supporting an Outstanding Student Experience by Student Hosts</b> INTERNATIONAL STUDENT SERVICES, LA TROBE UNIVERSITY	Melbourne, Australia 2018
<b>La Trobe College Excellence Scholarship</b> LA TROBE UNIVERSITY	Melbourne, Australia 2017-2019
<b>Merit based Scholarship</b> KATHMANDU UNIVERSITY	Dhulikhel, Nepal 2013-2016
<b>Award for the top achieving student</b> GANDAKI HIGHER SECONDARY BOARDING SCHOOL	Pokhara, Nepal 2012
<b>Award for the highest performing student</b> DISTRICT EDUCATION OFFICE, MINISTRY OF EDUCATION, GOVERNMENT OF NEPAL	Nepal 2008

## Trainings and workshops attended

### PROGRAMMING AND MODELLING WORKSHOPS

- Jun 28, Jul 09, 2021: Data-Driven Modelling in Mathematical Biology (Virtual), MATRIX and AMSI
- Jun 28 - Jul 02, 2021: Helminth Bioinformatics - Asia (Virtual), Welcome 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), Welcome 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, R, Subedi, DP, Adhikari, S, Maharjan, A, Shrestha, H & Pandey, GR 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
- Shrestha Manandhar, J, Shrestha, R, Basnet, N, Silwal, P, Shrestha, H, Risal, A & Kunwar, D 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
- Shrestha, JTM, Shrestha, H, Prajapati, M, Karkee, A & Maharjan, A 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, 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 & 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 & 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.
- H Shrestha, SM Hedtke, K McCulloch, S Wanji, WN Grant (2019). The basis of ivermectin resistance in *Onchocerciasis*: selection of parasites with high fecundity. Poster presentation at 2nd Annual PAM HDR Symposium held at John Scott Meeting House, La Trobe University, Victoria, December 12, 2019.
- Gautam S, Gyawali P, Singh J, Shrestha H (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.
- R Shrestha, S Adhikari, A Maharjan, H Shrestha, G.R. Pandey, DP Subedi (2016). Experimental Study of Atmospheric Pressure Argon Plasma Jet Induced Strand Breakage on Large DNA Molecule. Poster presentation at 7th National Conference on Science and Technology, Kathmandu, Nepal, March 29-31, 2016.