

Name: Pankaj Mehrotra

Date of Birth: 26.01.1985, **Gender:** Male

Current Residential Address : A-108, Kaushambi, Ghaziabad, Uttar Pradesh, NCR-Delhi, India

Marital Status : Married and a Son

Email: mehrotra85pankaj@gmail.com

Contact Number: 0091-8130980943

Educational Qualification(s):

- **2007:** Bachelor of Science (Honors) in Applied Zoology from University of Delhi, India. (Aggregate percentage: 71%, University Gold Medalist)
- **2010:** Master of Science in Integrative Genomics from Black Hills State University, South Dakota, United States of America. (GPA: 3.824/4.00)
- **2014:** Doctor of Philosophy in Medical Sciences (Science) from the Institute of Medical Sciences, University of Aberdeen, Scotland.
- **2015:** 13 credit hours of graduate coursework in Science Education (Biology), The University of Southern Mississippi, Mississippi, United States of America.

Work Experience (s):

Faculty Appointments

2021

August, 2021 - October, 2021 - Assistant Professor in Education - Zoology , Faculty of Education, Manav Rachna University, Faridabad, Delhi NCR, Haryana, India.

April, 2021 – Present – Infectious Disease Professional and BioRisk Reduction Instructor (Virtual - Synchronous Presentation & Teaching via Google Meet), BioRisk Reduction, California, United States of America.

October, 2020 – Present – Advanced Placement Teacher (Virtual - Synchronous Teaching via Zoom) - Biology, Chemistry, Environmental Science, Medical Terminology and Health Science, Aquinas International Academy, California, United States of America.

September, 2016- Present - Biology and Health Science Instructor, (Virtual- Asynchronous via Moodle), University of the People, California, United States of America.

2020

September, 2016- Present - Biology and Health Sciences Instructor, University of the People, California, United States of America.

October, 2020 – Present – Advanced Placement Biology, Chemistry and Environmental Science Teacher (AP), Aquinas International Academy, California, United States of America.

December, 2019 - May, 2020 – IBDP and MYP Biology Teacher, Pathways School, Off Gurugram Faridabad Road, Gurugram, Haryana, India.

2019

December, 2019- Present – MYP and IBDP Biology Teacher, Pathways School, Off Gurugram Faridabad Road, Gurugram, Haryana, India.

September, 2016- Present - Biology and Health Sciences Instructor, University of the People, California, United States of America.

September, 2018, 2019- May, 2019 - Faculty in Biology and Chemistry, Bard Early College, Shenzhen, China

2018

Faculty Appointments

September, 2018- December, 2018- Faculty in Biology and Chemistry, Bard Early College, Shenzhen, China

January, 2018- Present- Biology and Health Sciences Instructor, University of the People, California, United States of America.

2018

Faculty Appointments

August, 2017- June, 2018- IBDP and IGCSE Biology Teacher, International Academia, Suncity World School, Gurgaon, NCR Delhi, India.

January, 2018- Present- Biology and Health Sciences Instructor- University of the People, California, United States of America.

January, 2018- December, 2018- Subject Matter Expert, Talent Pool- Life Sciences – Western Governors University, United States of America.

2017

Faculty Appointments

August, 2017- December, 2017- IBDP and IGCSE Biology Teacher, International Academia, Suncity World School, Gurgaon, NCR Delhi, India

January, 2017- Present- Biology Instructor- University of the People, California, United States of America.

May, 2017- July, 2017- Visiting Lecturer of Biology, St. Theresa International College, Thailand.

January, 2017- December, 2017- Subject Matter Expert- Life Sciences – Western Governors University, United States of America.

2016

Faculty Appointments

- **September, 2016- Biology Instructor**, University of the People, United States of America.
- **December, 2016- External Examiner Faculty (Animal Diversity)** – RNB Global University, Bikaner, Rajasthan, India
- **April, 2016- May, 2016 - Senior Assistant Professor** (Pre Medical) - fE Education Private Limited, NCR Delhi, India
- **July, 2016- November, 2016- Faculty (Biology and Zoology)-** Gyan Mudra Innovations LLP. NCR Delhi, India

2015

- September-December, 2015 - **Visiting Postdoctoral Fellow**, Southern Illinois University, Carbondale, Illinois, USA. (J-1 Visa Work Permit).
- January-May, 2015- Student Faculty Appointment - **Graduate Assistant / Lecturer**, The University of Southern Mississippi, USA (F-1 Student Visa Work Permit).

Teaching Experience (s):

Assistant Professor in Education - Zoology, Faculty of Education, Manav Rachna University, Faridabad, Delhi NCR, Haryana, India.

2021-2022

EDH 114 - Animal Diversity - I (3 Credits Theory + 1 Credit Laboratory Practicals)

EDH 205 - Animal Diversity - III and Comparative Anatomy of Vertebrates (3 Credits Theory + 1 Credit Laboratory Practicals)

EDH 302 - Ecology and Animal Behaviour (3 Credits Theory + 1 Credit Laboratory Practicals)

EDH 402 - Molecular Biology and Immunology (3 Credits Theory + 1 Credit Laboratory Practicals)

September, 2016 - Present - Health Sciences and Biological Sciences Instructor, University of the People, United States of America

2021-2022

Term 1, HS 3995 - Internship (Credits 6)

Term 1, HS 4812 - Bioethics (Credits 3)

Term 1, BIOL 1121 - Biology 1 for Health Studies Major (Credits 4)

October, 2021 - Present : Advanced Placement Teacher (AP) - Anatomy & Physiology, Biology, Chemistry, Environmental Science and Health Science , Aquinas International Academy, United States of America.

- Advanced Placement Biology - **September, 2021- Present**
- General Biology Semester I – **September, 2021 - Present**
- General Chemistry Semester II – **August, 2021 - Present**
- Honors Biology Semester I – **October, 2021- Present**
- Medical Terminology Semester I - **September, 2021 - Present**
- Advanced Placement Chemistry –
- Advanced Placement Environmental Science –
- Health Science -

STEM Science Summer Camp I and II - Biology, Physics, Chemistry, Literature, Genomics, Bio-informatics and Biotechnology.

April, 2021 - Present : Infectious Disease Professional and BioRisk Reduction Instructor (Virtual - Synchronous Presentation & Teaching via Google Meet), BioRisk Reduction, California, United States of America.

- Introduction : Adverse Events, Near Misses, Laboratory Acquired Infections and Bio incidents - Presenter & Facilitator.
- Adverse Event due to Fungus and Molds growth in Forensic Science Laboratory
- Adverse Event due to Virus in research laboratory by Recapping of Needle.
- Blood Borne Pathogens - Presenter and Facilitator
- Centre for Disease Control- Project First Line, Atlanta, Georgia - Presenter and Facilitator

2021-2021

Health Sciences and Biological Sciences Instructor, University of the People, United States of America

Term 5, HS 3995 - Internship (Credits 6)

Term 5, BIOL 1301 - Introduction to Biology (Credits 3)

Term 5, HS 3210 - Human Diseases (Credits 3)

Term 5, HS 4812 - Bioethics (Credits 3)

2020-2021

Health Sciences and Biological Sciences Instructor, University of the People, United States of America

Term 4, BIOL 1121 - Biology 1 for Health Studies Major (Credits 4)

Term 4, HS 2212 - Infectious Diseases (Credits 3)

Health Sciences and Biological Sciences Instructor, University of the People, United States of America

Term 3, HS 4812 - Bioethics (Credits 3)

Term 3, ENVS 1301 - Introduction to Environmental Sciences (Credits 3)

Term 3, HS 3995 - Research Internship (Credits 6)

2020-2021

Health Sciences and Biological Sciences Instructor, University of the People, United States of America

Term 2, BIOL 1121 - Biology 1 for Health Studies Major (Credits 4)

Term 2, BIOL 1301 - Introduction to Biology (Credits 3)

Term 2, HS 3995 - Research Internship (Credits 6)

2020 October- September, 2021

Advanced Placement Teacher (AP), Anatomy & Physiology, Biology & Chemistry Teacher, Aquinas International Academy, United States of America.

- Advanced Placement Biology- **October, 2020 - June, 2021**
- Advanced Placement Chemistry – **October, 2020 - June, 2021**
- General Biology Semester I – **October, 2020 - February 2021**
- General Chemistry Semester I – **October, 2020 - February 2021**
- General Biology Semester II – **February, 2021- June, 2021**
- General Chemistry Semester II – **February, 2021- June, 2021**
- Summer - STEM Science Camp 1 and 2 - **June - September, 2021.**

2020-2021

Health Sciences and Biological Sciences Instructor, University of the People, United States of America

Term 1, BIOL 1121 - Biology 1 for Health Studies Major (Credits 4)

Term 1, BIOL 1122 - Biology 2 for Health Studies Major (Credits 4)

Term 1, HS 3995 - Research Internship (Credits 6)

2019-2020

Health Sciences and Biological Sciences Instructor, University of the People, United States of America

Term 5, CPH 4812 - Bioethics (Credits 3)

Term 5, CPH 2212: Infectious Diseases (Credits 3)

2019-2020

MYP and IBDP Biology Teacher, Pathways School, Gurugram, Haryana, India.

MYP Biology – Transport System in Plants and Evolution.

IBDP Biology – Molecular Biology and Genetics.

2019-2020

Health Sciences and Biological Sciences Instructor, University of the People, United States of America

Term 4, CPH 4812 - Bioethics (Credits 3)

Term 4, CPH 4510 - Biostatistics (Credits 3)

Health Sciences and Biological Sciences Instructor, University of the People, United States of America

Term 3, CPH 4812 - Bioethics (Credits 3)

Health Sciences and Biological Sciences Instructor, University of the People, United States of America

Term 2, BIOL 1301- Introduction to Biology (Credits 3)

Term 2, BIOL 1121 – Biology 1 for Health Studies Major (Credits 4)

Health Sciences and Biological Sciences Instructor, University of the People, United States of America

- Term 1, BIOL 1122 – Biology 2 for Health Studies Major (Credits 4)
- Term 1, CPH 4212 – Genetics (Credits 3)

2018-2019

Health Sciences and Biological Sciences Instructor, University of the People, United States of America

- Term 5, BIOL 1121 – Biology 1 for Health Studies Major (Credits 4)
- Term 5, CPH 2212 – CPH 2212: Infectious Diseases (Credits 3)

Health Sciences and Biological Sciences Instructor, University of the People, United States of America

- Term 4, BIOL 1121 – Biology 1 for Health Studies Major (Credits 4)

Health Sciences and Biological Sciences Instructor, University of the People, United States of America

- Term 3, CPH 2212 – CPH 2212: Infectious Diseases (Credits 3)

Faculty, Bard Early College, Shenzhen, China.

Spring, 2019 (February 2018- May, 2019)

- Biology - BIO 102 - College General Biology II with laboratory: Organisms and Population (Credits 4)
- Independent Study - BIO IND - Independent Study in Stem Cell Biology (Credits 1)

Faculty, Bard Early College, Shenzhen, China.

Fall, 2018 (September, 2018- January, 2019)

- Biology - BIO 101 - College General Biology I with laboratory : Introduction to Cell and Molecular Biology (Credits 4)
- Chemistry - CHEM 101 - College General Chemistry I with laboratory: Fundamentals of Chemistry (Credits 4)

2018-2019

Health Sciences and Biological Sciences Instructor, University of the People, United States of America

- Term 2, BIOL 1301 – BIOL 1301 – Introduction to Biology (Credits 3)
- Term 2, CPH 2212 – CPH 2212: Infectious Diseases (Credits 3)

Health Sciences Instructor, University of the People, United States of America

- Term 1, BIOL 1122 – Biology 2 for Health Studies Major (Credits 4)
- Term 1, BIOL 1121 – Biology 1 for Health Studies Major (Credits 4)
- Term 1, CPH 2212 – CPH 2212: Infectious Diseases (Credits 3)

2017-2018

Health Sciences Instructor, University of the People, United States of America

- Term 5, BIOL 1122 – Biology 2 for Health Studies Major (Credits 4)
- Term 5, BIOL 1121 – Biology 1 for Health Studies Major (Credits 4)

Health Sciences Instructor, University of the People, United States of America

- Term 4, BIOL 1122 – Biology 2 for Health Studies Major (Credits 4)
- Term 4, BIOL 1121 – Biology 1 for Health Studies Major (Credits 4)

Biology Instructor, University of the People, United States of America

- Term 3, BIOL 1301 – Introduction to Biology (Credits 3)

Health Sciences Instructor, University of the People, United States of America

- Term 3, BIOL 1122 – Biology 2 for Health Studies Major (Credits 4)

2018

January, 2018 - June, 2018- Biology Teacher, International Academia, Suncity World School, Gurgaon, NCR Delhi

- International General Certificate of Secondary Education (IGCSE - Biology Teacher) Cambridge, United Kingdom.
- International Baccalaureate Diploma Program (IBDP- Biology- Teacher) United States of America and Switzerland.

Semester 2 (IX Grade) and Semester 4 (X Grade)

Active Learning Exercises: Classroom, laboratory and field-based learning.

Examination - Half Yearly Examination, Mock Examination, Progress Check Test and Pre-board Examination

2017

August, 2017- June, 2018- Biology Teacher, International Academia, Suncity World School, Gurgaon, NCR Delhi

- International General Certificate of Secondary Education (IGCSE - Biology Teacher) Cambridge, United Kingdom.
- International Baccalaureate Diploma Program (IBDP- Biology- Teacher) United States of America and Switzerland.

Semester 1 (IX Grade) and Semester 3 (X Grade)

Active Learning Exercises: Classroom, laboratory and field based learning.

Examination - Progress Check Test and Half Yearly Examination.

Biology Instructor, University of the People, United States of America

2017-2018

- Term 2, BIOL 1301 – Introduction to Biology (Credits 3)

Biology Instructor, University of the People, United States of America

- Term 1, BIOL 1301 – Introduction to Biology (Credits 3)

Lecturer of Biology, St Theresa International College, Thailand

May-June-July, 2017

Faculty of Education

BIO 153 111- Biology (Credits 3)

BIO 153 111 Laboratory (Non-Credits)

Faculty of Nursing Science

BIO 900 101- Biology (Credits 3)

Faculty of Public Health

BIO 501 105- Biology (Credits 3)

2016-2017

Biology Instructor, University of the People, United States of America

- Term 3, BIOL 1121 – Biology 1 for Health Studies Majors (Credits 4)

Biology Instructor, University of the People, United States of America

- Term 4, BIOL 1301- Introduction to Biology (Credits 3)

2016

- **External Examiner Faculty-** RNB Global University, Bikaner, Rajasthan, India
- Laboratory Practical for Bachelor of Science undergraduate program
- Discipline Specific Core Course Paper- Zoology
- Course Name: Animal Diversity
- Lab Course Code: 13003600

Association on per lecture basis teaching for Pre-Medical Competitive Examinations Preparations (May-November, 2016)

- Faculty (Biology and Zoology), Gyan Mudra Innovations LLP, Gyan Mudra Group, NCR Delhi, Uttar Pradesh, India.
- Senior Assistant Professor (Pre-Medical Crash Course), fE Classes, Indirapuram Institute for Higher Studies, Indirapuram, Ghaziabad, Uttar Pradesh, India. (Delivered required lectures for PMT Crash Course).

At fEClasses, fE Education Private Limited, Indirapuram Institute for Higher Studies, Indirapuram, NCR Delhi, India.

Senior Assistant Professor: Pre Medical Test (PMT) Crash Course.

Lecture - Smart Class Format (Projector, Pointer, PowerPoint slides, Smart Board, I-clicker assessment method- Multiple Choice Questions and Subjective Questions)

- A) Invertebrates Diversity.
- B) Respiratory system of Invertebrates and Vertebrates.
- C) Excretory systems of Invertebrates and Vertebrates.
- D) Digestive system of Invertebrates and Vertebrates
- E) Circulatory System of Invertebrates and Vertebrates
- F) Nervous system (Part I) of Invertebrates and Vertebrates
- G) Nervous system (Part I) of Invertebrates and Vertebrates
- H) Locomotion and Movement of Invertebrates and Vertebrates

2015

At The University of Southern Mississippi: **Lecturer** BSC III- Principles of Biology

- Invertebrates Diversity II - (February, 26th, 2015).
- Respiratory and Excretory System- (April, 2th, 2015).
- Teaching Assistant: BSC III-Principles of Biology.

2008-2010**At Black Hills State University: Teaching Assistant**

- General Microbiology Laboratory, Teaching Assistant BIOL 231L (Aug-Dec, 2009).
- Teaching Assistantship for a workshop organized by The Center for the Advancement of Mathematics and Science Education (CAMSE) for teaching lab experiments in life sciences to High and Middle school teachers (8-15 Jun, 2010).
- Basic Microbiology Laboratory, Teaching Assistant BIOL 331L (Jan-Apr, 2009).
- Cell and Molecular Biology Lab, Teaching Assistant BIOL 343L (Aug-Dec, 2008).

Mentoring Experience(s):

- Mentorship through Judging at The Oak Groove Lower Elementary School, Hattiesburg, Mississippi (Feb, 5th, 2015).
- Mentorship through Judging at Mississippi Region I Upper Science and Engineering Fair, USM (Grades 7-12) (Feb, 12th, 2015).
- Mentorship through Judging at Mississippi Science and Engineering State Fair, USM (Grades 7-12) (March, 24th, 2015).
- Mentorship through Judging at Mississippi Region I Lower Science and Engineering Fair, USM (Apr, 8th, 2015).
- Supervised undergraduates SD-INBRE students at the Black Hills State University, South Dakota, United States of America (Jan-April, 2009, May-Aug, 2009).

Peer Reviewed, Research Abstracts, Poster & Oral Presentations, Review and Research Articles :**Biology Education**

Mehrotra, P. (2021). Impact of COVID-19 on transformation of Teaching, Learning and Assessment

http://ijariie.com/AdminUploadPdf/Impact_of_COVID_19_on_transformation_of_Teaching_Learning_and_Assessment_ijariie15471.pdf

Mehrotra, P. (2020). "Teaching, Learning and Assessment of International Baccalaureate Organization Biology Students" International Journal Of Advance Research And Innovative Ideas In Education Volume 6 Issue 3 2020 Page 1123-1126.

http://ijariie.com/AdminUploadPdf/Teaching_Learning_and_Assessment_of_International_Baccalaureate_Organization_Biology_Students_ijariie12131_converted.pdf

Mehrotra, P. (2019). Active Engagement and Learning of Early College Students in Classroom and Laboratory. <http://ierj.in/journal/index.php/ierj/article/view/1907/1811>

Mehrotra, P. (2018). Biology Education: Active learning exercises to engage high school and college students. <http://ierj.in/journal/index.php/ierj/article/view/1679/1598>

Science Education (Biology)

Mehrotra, P. (2016). An attempt to understand and assess Bachelor of Science (Microbiology) Degree Program in United States of America. *International Education and Research Journal*, 2(8). <http://ierj.in/journal/index.php/ierj/article/view/415/392>

Mehrotra, P. (2016): Comparative overview of Bachelor of Science (Microbiology) degree program structure across different countries "International Journal of Advanced Education and Research".

(Volume 1, Issue 8, Page 37-41)

<http://www.alleducationjournal.com/archives/2016/vol1/issue8/1-8-20>

Mehrotra, P. (2016): Integrative Bioscience: An undergraduate course for Bachelor of Science degree program in United States of America. *International Journal of Advance Research And Innovative Ideas In Education*. Vol-2 Issue-4 2016 , 1070-1076 [Integrative Bioscience: An undergraduate course for Bachelor of Science degree program in United States of America jariie3002.pdf](http://www.ijariie.com/AdminUploadPdf/Integrative%20Bioscience%20An%20undergraduate%20course%20for%20Bachelor%20of%20Science%20degree%20program%20in%20United%20States%20of%20America%20jariie3002.pdf)

Mehrotra, P. (2016). Introduction of I-clicker assessment method. *International Journal of Advance Research and Innovative Ideas in Education*, 2(4), 1024-1024 http://ijariie.com/AdminUploadPdf/Introduction_of_I_clicker_assessment_method_ijariie3003.pdf

Ph.D. in Medical Sciences

Perez-Nadales E, Almeida Nogueira MF, Baldin C, Castanheira S, El Ghalid M, Grund E, Lengeler K, Marchegiani E, **Mehrotra PV**, Moretti M, Naik V, Osés-Ruiz M, Oskarsson T, Schäfer K, Wasserstrom L, Brakhage AA, Gow NA, Kahmann R, LebrunMH, Perez-Martin J, Di Pietro A, Talbot NJ, Toquin V, Walther A, Wendland J Fungal model systems and the elucidation of pathogenicity determinants. *Fungal Genet Biol*. 2014 Jul 7. (doi : <http://dx.doi.org/10.1016/j.fgb.2014.06.011>)

Immune recognition of *Candida albicans* influenced by defects in cell signal transduction pathways. **P. Mehrotra**, R. A. Hall, J. Wagener and N. A. R. Gow. Blackwell Verlag GmbH Mycoses 55 (Suppl. 4), 95–338, Mycoses. 2012 Jun;55 Suppl 4:1-355. Research Abstracts of the 18th Congress of the International Society for Human and Animal Mycology. June 11-15, 2012. Berlin, Germany. P 219

Poster and Slides

Mehrotra P, Hall RA, Wagener J and Gow NAR. Immune recognition of *Candida albicans* influenced by defects in cell signal transduction pathways *F1000Research* 2016, **5**:1972 (doi: [10.7490/f1000research.1112825.1](https://doi.org/10.7490/f1000research.1112825.1)) (Mycoses Journal)

Mehrotra P, Hall RA, Wagener J and Gow NAR. Yeast-hypha transition and immune recognition of *Candida albicans* affected by defects in the cell signal transduction pathways. *F1000Research* 2016, **5**:1973 (doi: [10.7490/f1000research.1112826.1](https://doi.org/10.7490/f1000research.1112826.1))

Mehrotra P. Yeast-hypha transition and immune recognition of *Candida albicans* affected by defects in the cell signal transduction pathways. *F1000Research* 2016, **5**:1974 (doi: [10.7490/f1000research.1112827.1](https://doi.org/10.7490/f1000research.1112827.1))

M.S. in Integrative Genomics

Expression of Two *Nitrosomonas europaea* Proteins, *Hydroxylamine Oxidoreductase* and NE0961 in *Escherichia coli*. Author(s): **Pankaj V. Mehrotra**, Kelli Brunson, Alan Hooper, and David Bergmann Year: 2012 Volume: 91 Pages: 145-157. <http://www.sdaos.org/wp-content/uploads/pdfs/Vol%2091%202012/145-157.pdf>

Expression of Two *Nitrosomonas europaea* Proteins, *Hydroxylamine Oxidoreductase* and NE0961, in *Escherichia coli* BL21 (De3). Author(s): **Pankaj Mehrotra** and David Bergmann Year: 2010 Volume: 89 Pages: 243 <http://www.sdaos.org/wp-content/uploads/pdfs/2010/243.pdf>

Malarial Parasite Infection and MHC Variability in the White Winged Junco. Author(s): Jess Moser, **Pankaj Mehrotra**, Daniel Terveen, Christy Bergeon-Burns, Ellen Ketterson and Garth Spellman Year: 2010 Volume: 89 Pages: 290 <http://www.sdaos.org/wp-content/uploads/pdfs/2010/290.pdf>

Differential Expression of *Candida albicans* Genes in Response to Silver Compounds. Author(s): Polly A. Hall, **Pankaj Mehrotra** and Cynthia Anderson. Year: 2010 Volume: 89 Pages: 242 <http://www.sdaos.org/wp-content/uploads/pdfs/2010/242.pdf>

Mechanism of Resistance to Silver Compounds in Dermatophytic Fungi Author(s): Polly A. Hall, **Pankaj Mehrotra**, and Cynthia Anderson Year: 2009 , Volume: 88 Pages: 199 <http://www.sdaos.org/wp-content/uploads/pdfs/2009/199.pdf>

Textbook

Fundamentals of Biology – Top Hat Publication, ISBN Number - 978-1-77412-526-7

Technical Expertise(s):

- **Microbiology Techniques:** Preparation of growth medium for cultivation of bacteria and fungi such as Luria Broth medium (LB), LB agar, Sabouraud medium, Yeast Peptone Dextrose medium (YPD medium), YPD medium with pH, YPD agar, Storage of bacterial and fungal cells in glycerol stock. Fungal morphology stimulation and inhibition assay using serum, cell wall and physiological stress assay.
- **Molecular Biology Techniques:** DNA, RNA, Protein extraction, qualitative analysis of DNA, RNA and Protein by DNA Agarose Gel Electrophoresis, RNA Denaturation Gel Electrophoresis, and SDS-PAGE Gel, quantification and purification of DNA, RNA and protein from bacterial, fungal, muscular and blood samples of birds, extensive PCR experience, Restriction Enzyme Digestion and analysis, and recombinant DNA cloning.
- **Genomic Techniques:** Purification of PCR product by Exo-Sap, Big Dye Sequencing, Sanger DNA sequencing, Gene profiling by cDNA synthesis and RT-PCR.
- **Standard Protein Biochemical and Analytical Techniques:** Recombinant protein expression and purification from *E. coli* (SDS-PAGE and Western Blotting) and biochemical enzyme assay.

- **Immunology Techniques:** Isolation of h-PBMCs, h-PMNs and propagation of RAW264.7 macrophages, Neutrophil-*Candida* killing assay, counting of immune cells using Haemocytometer, and quantification of pro-inflammatory cytokine (TNF- α , IL1- β and IL-6) and anti-inflammatory cytokine IL-10 by ELISA.

Oral and Poster presentations at Regional and International Conferences / Meetings

Oral presentation (s):

- “ARIADNE” Mid-term Meeting University of Cordoba, Cordoba, Spain. Overview of past, present project and future prospects of Marie Curie Fellows (3rd Feb, 2012).
- “College of Life Sciences and Medicine” Graduate School PhD symposium, University of Aberdeen, Aberdeen, United Kingdom (16th, Jun, 2011).
- “Aberdeen Fungal Group” annual retreat, Burn House, Edzell, United Kingdom. “Stress Signaling and immune response of *Candida albicans*” (14th Jan, 2011).
- “ARIADNE” Workshop II “Pathogenicity in Fungi”. University of Cordoba, Cordoba, Spain. Overview of characteristics of mutants of MAPK pathways (31st Jan, 2012).
- “College of Life Sciences and Medicine” Graduate School PhD symposium, University of Aberdeen, Aberdeen, UK. 16 - 17 June, 2011.
- “ARIADNE” First Annual Meeting. Max Planck Institute, Marburg, Germany. Stress Signaling and immune response of *Candida albicans* (April, 2011).
- “Aberdeen Fungal Group” annual retreat, Burn House, Edzell, UK. Stress Signaling and immune response of *Candida albicans*.
- “ARIADNE” Summer School I “Fungal Genetics and Biology”, Carlsberg Research Center, Copenhagen, Denmark. October 4th - 15th, 2010. Overview of *Candida albicans*. * Second Author.

Poster Presentation(s):

- “Immune recognition of *Candida albicans* influenced by defects in cell signal transduction pathways” at International Society for Human and Animal Mycology, Berlin, Germany. (Jun, 2012)
- “Immune recognition of *Candida albicans* influenced by defects in cell signal transduction pathways” at Annual British Mycological Society – Fungal Pathogenesis and Development. Exeter, United Kingdom. (Sep, 2011).
- “Expression of Two *Nitrosomonas europaea* Proteins, *Hydroxylamine Oxidoreductase* and NE0961, in *Escherichia coli* BL21 (DE3)” at American Society for Microbiologists, Rocky Mountain Branch Meeting, Fort Collins, Colorado, United States of America. (April, 2010).
- “Expression of two *Nitrosomonas europaea* proteins, *Hydroxylamine Oxidoreductase* and NE0961, in *Escherichia coli* BL21 (DE3)” at the 95th annual meeting of the South Dakota Academy of Science (April, 2010).

- “Malarial parasites in the endemic White-winged Junco: the impact of seasonality, sex, and body condition on infection rates.” at 12th Annual Research Symposium, Black Hills State University, South Dakota, USA (April, 2010).
- “Malarial Parasites in the Endemic White-winged Junco: the impacts of seasonality, sex, and body condition on infection rates.” at 4th Annual South Dakota Biotechnology Summit and Annual Meeting, Sioux Falls, South Dakota. (April, 2009).
- "Mechanism of Resistance to Silver Compounds in Dermatophytic Fungi." at 94th South Dakota Academy of Sciences (April, 2009).
- Malarial parasites in the endemic White-winged Junco: the impact of seasonality, sex, and body condition on infection rates.” at the Summer SD- INBRE Convocation, Vermillion, South Dakota (August, 2009).
- “Mechanism of Resistance to Silver Compounds in Dermatophytic Fungi.” At Black Hills State University 11th Annual Research Symposium (April, 2009).

Scientific Research Experience(s):

2019-2020 - International Baccalaureate Organization (IBO)

International Baccalaureate Diploma Programme (IBDP) - Internal assessment (IA) in Biology and **Extended Essay (EE)** research Projects in Biochemistry, Bioinformatics & Genomics, Plant Biology, Molecular Biology and Cell Biology , Plant Biology and Microbiology.

2010-2014

Ph.D. Thesis Research Project

- **Title**-“Immunological and morphological characterization of *Candida albicans* and *Candida haemulonii* / *auris*” under supervision of Prof. Neil A.R. Gow (Sep, 2010-May, 2014).

•**Introduction**- *Candida albicans* is a major opportunistic fungal pathogen of humans, which can cause superficial mucosal infections as well as fatal systemic disease in immune-compromised individuals. During the infection process, *C. albicans* has to respond to a variety of stresses imposed by the host environment, such as reactive oxygen species (ROS) generated by phagocytic cells, changes in pH, stresses imposed by cell wall stress agents Caspofungin (CAS), Calcofluor white (CFW), physiological stresses such as oxidative and, osmotic stresses, nutrient availability and the presence of host hydrolytic enzymes designed to degrade invading microbes. These stresses result in the activation of multiple signaling pathways including the cAMP-PKA, MAPKs and the Ca²⁺-calcineurin pathways. Mutations in these pathways may also affect *C. albicans* cell surface biochemistry and its capacity for morphogenesis, both of which are believed to be key factors in fungal immune recognition. In the context of this project, which is a part of Marie Curie INT Network “ARIADNE”, I primarily

investigated how the activation or inhibition of these stress signaling pathways influenced immune recognition of *C. albicans* by myeloid cells.

- **Methodology**-To achieve this goal *C. albicans* cells lacking key proteins of these pathways were grown at yeast & and hyphae inducing conditions and challenged to h-PBMCs (human-Peripheral Blood Mononuclear Cells), RAW264.7 macrophages and h-PMNs (human-Polymorphnuclear cells) to assess the changes in pro-inflammatory cytokine stimulation and phagocytosis respectively. Similar methodology was used for *C. haemulonii* / *auris* complex strains.

- **Results**-It has been has been shown that both the activation and inhibition of these pathways play important roles in regulating cell wall shape and remodelling. The mutations in these pathways therefore affect *C. albicans* cell surface biochemistry and morphogenesis which are key factors in fungal immune recognition. I confirmed that the deletion of *CEK2*, *HOG1*, *TPK2*, *CYR1*, *CNA1* and *CNB1*, resulted in the repression of yeast to hypha transition - a virulence trait required for *C. albicans* dissemination in the host tissues. Interestingly, it was also found that deletion of *TPK1*, *CNB1* and *CNA1* , resulted in lower pro-inflammatory cytokine production, and the deletion of *HOG1* also led to marked differences in the cytokine production profile. Immune-recognition was also affected by the exposure of *C. albicans* signalling mutants to physiological (osmotic, oxidative combinatorial stresses) and cell wall stresses (caspofungin and Calcofluor-White treatment) that acted as agonists of these pathways. Immune-recognition of *C. albicans* was also affected by exposure to metabolic inhibitors such as antimycin A and rifampicin. The ura-status of *C. albicans* examined also had an effect on the immune reactivity of the cell.

- Finally I investigated the cytokine responses from an emerging *Candida* species complex in the Indian subcontinent including *Candida haemulonii* and *Candida auris*. Little or no information existed about the immune signature of these species which are reported to show unusual levels of resistance to the polyene antibiotic – amphotericin B. It was found that almost all of the *C. haemulonii* complex strains used in this study showed significant differences in stimulation of pro-inflammatory and anti-inflammatory cytokines.

- **Conclusions**- These results suggest that these stress signaling pathways act in concert to regulate the yeast-hypha morphogenesis and the changes in the cell wall which can lead to further alterations in the cytokines that are secreted by human monocytes, and other myeloid cells of the innate immune system. Therefore *C. albicans* cells present a moving target to the immune system, and all strains demonstrate considerable immunological variability depending on the niche in which they are growing and the stresses that they experience.

- **Future Directions**- These insights are valuable since they contribute to our understanding of variability in the immunological signature of a fungus when a single strain is grown under a range of environmental conditions. The results of my Ph.D. research demonstrated that these signaling pathways markedly influenced the immunological signature of the cell by both direct and indirect ways, presumably by altering cell wall composition and yeast-hypha morphogenesis.

2008-2010**Master Degree Research Project(s):**

- M.S. graduate degree research projects under direction of Associate Prof. Garth M. Spellman completed at Centre for Conservation of Biological Resources:

a) MHC variability in the White Winged Junco studying relationship between malarial parasite infection and the host MHC alleles; using alleles specific primers and using DGGE for identification of alleles and further sequencing analysis under supervision of Dr. Garth M. Spellman (May-Jun, 2010).

b) Heterologous expression of *hydroxylamine oxidoreductase* gene of *Nitrosomonas europea* in *Escherichia coli* under supervision of Prof. David J. Bergmann (Aug-Dec, 2009).

c) Studying relationship between avian malaria blood parasite infection rate and body condition in *Junco hyemalis aikenii* using a nested PCR assay and DNA sequencing analysis under supervision of Dr. Garth M. Spellman in collaboration with Dr. Chirsty Burgeons Burns of Indiana University (May-Aug, 2009).

d) Effect of silver on dermatophytic fungus such as *Microsporum gypseum*, *Tricophyton mentagrophytes*, *Candida krusei* and *Candida albicans*, and its mechanism of resistance to silver compounds under supervision of Assistant Professor Cynthia M. Anderson (Jan-Apr, 2009).

e) Phylogeography of North American birds under supervision of Dr. Garth M. Spellman (Aug- Dec, 2008).

2007**Undergraduate Research Training Project (s):**

a) Completed a six week project in the field of Protein folding and biosynthesis mechanisms of GPI anchored proteins in *Giardia lamblia* as a student trainee at Jawaharlal Nehru University, New Delhi, India under supervision of Prof. Sneha Sudha Komath.

b) Completed a six week intensive program for undergraduates by International Centre for Genetic Engineering and Biotechnology (ICGEB), as a student trainee at the Department of Biochemistry, Sri Venkateswara College, University of Delhi. The work included cloning genes responsible for pathogenesis in *Mycobacterium tuberculosis* infection under supervision of Associate Professor P. Hemalatha Reddy.

Educational Research Experiences (s):

At The University of Southern Mississippi, Hattiesburg, USA

- An attempt to understand and assess (Qualitative and Quantative) Bachelor of Science (Microbiology) Degree in United States of America.
- Comparative (Qualitative and Quantative) overview of Bachelor of Science (Microbiology) Degree Program curriculum structure across different countries.
- Development of an undergraduate microbiology course- Integrative Bioscience.
- Review of undergraduate microbiology course- Molecular Microbiology, Genomics etc.

Extracurricular Activity Experiences(s):

- Co-organizer of Marie Curie Initial Training Network Workshop III “Medical Mycology, IPR and Fellowships”, Aberdeen, United Kingdom (Jul, 2012).
- Participation in organization of Inter-College Fest at Dyal Singh College, New Delhi, India. (Feb, 2005).

Fellowships/ Honors/Awards/Grants

- Teaching Award Certificate, Bard Early College at Houde Academy, Shenzhen, China(April, 2019)
- Graduate Assistantship from The Centre for Science and Mathematics Education, The University of Southern Mississippi, Hattiesburg, USA.
- Recipient of Marie Curie Initial Training Fellowship financed by Marie Curie Actions.
- Biochemistry Travel Award, University of Aberdeen, Aberdeen, United Kingdom.
- British Mycological Society, Small Grant Scheme, Manchester, United Kingdom.
- Scientific Meeting Travel Grant, Society for General Microbiology, Reading, United Kingdom.
- Second Best Graduate Poster Prize, American Society for Microbiologist, Branch Meeting, April 23-24 2010, Fort Collins, Colorado, United States of America.
- Master of Science Integrative Genomics Fellowship financed by South Dakota Biomedical Research Internship (BRIN).
- University Topper and Gold Medalist, University of Delhi for securing First Position at the Annual BSc Honors Examination, 2004-2007.

- Certificate(s) of Merit for securing First Rank at Dyal Singh College, Annual BSc Honors Applied Zoology House Examination Part I, II & III.
- Certificate of Merit for securing First Rank at University of Delhi, Annual BSc Honors Applied Zoology Annual Examination Part III.
- Certificate of Merit for securing First Rank at University of Delhi, Annual BSc Honors Applied Zoology Annual Examination Part II.
- Second rank at the annual Science Quiz organized by Department of Zoology, Dyal Singh College, University of Delhi,
- Certificate of Merit for securing Second Rank at University of Delhi Annual BSc Honors Applied Zoology Examination Part I.

Other Professional Qualification(s):

• 2010- 2013: Certificate courses

- a) Workshop on "**Cell Cycle Regulation in Fungi**" at Instituto de Biología Funcional y Genómica, Salamanca, Spain (17-21 Jun, 2013).
- b) Summer School on "**Fungal Proteomics and Bioinformatics**" at Hans Knöll Institute, Jena, Germany (8-19, Oct, 2012).
- c) Workshop on "**Medical Mycology and IPRs**" at University of Aberdeen, Aberdeen, United Kingdom (2-5 Jul, 2012).
- d) Workshop on "**Pathogenicity in Fungi**" at University of Cordoba, Cordoba, Spain (30 Jan-2 Feb, 2011).
- e) Summer School on "**Bioinformatics and Genome Analysis**" at - University of Exeter, Exeter, United Kingdom (5-16 Sep, 2011).
- f) Workshop on "**Scientific Writing and Presentation**", Max Planck Institute of Terrestrial Microbiology, Marburg, Germany (27 Mar-2 Apr, 2011).
- g) Summer School on "**Fungal Genetics and Biology**" in Carlsberg Laboratory at University of Copenhagen, Copenhagen, Denmark (1-15 Oct, 2010).
- h) Participated in **Educators Connect**, 2015 meeting organized by The Learning Enhancement Center (LEC), USM, (Feb, 17th, 2015). Active Learning Exercises, 5 Es Teaching Models, Bloom's Taxonomy, clicker assessment methods, Team Based Learning etc.
- i) **New Faculty Training (FCLT 001) Completion**, University of the People, California, United States of America.

j) Workshop on **Clinical Trials FAQ, Good Clinical Practice** at Tata Translational Cancer Research Centre, Tata Medical Center, Kolkata, India (28th, October, 2016).

k) **New Faculty (FCLT 001) Completion**, University of the People, California, United States of America.

l) **SEE Learning 101** - Social, Emotional, and Ethical Learning, Emory University, Atlanta, Georgia, United States of America (April 5th, 2020).

m) **Introduction to COVID-19: methods for detection, prevention, response and control-** World Health Organization, Geneva, Switzerland (April, 22nd, 2021).

n) **FAS 801 - General Education and Curriculum Mapping** , Course and Workshop - University of the People, California, United States of America (September 18th- 26th, 2021).

o) **FAS 803 - Program Curriculum Mapping** , Course and Workshop - University of the People, California, United States of America (October- 8th - November, 6th,2021).