

# IDENTIFYING EMERGING DISEASE IN INDIA

A RESEARCH-BASED INTERNSHIP SPRING 2022



Many antibiotic-resistant bacterial infections are on the rise. In fact, by 2050 antibiotic-resistant bacterial infections are expected to be the number one cause of death in the United States ([www.cdc.gov](http://www.cdc.gov)). India is where many of the antibiotic resistant genes evolve due to the high population combined with the presence of antibiotics in the local rivers and lakes from antibiotic production factories. We plan to travel to India, isolate DNA from local sources such as rivers and lakes and then return to BYU to identify antibiotic-resistant genes present in the DNA, giving us an understanding of emerging disease before it hits the clinic. In addition, we will be taking samples from which to harvest bacteriophages, viruses that can infect and kill antibiotic-resistant bacteria. These bacteriophages are a novel treatment for antibiotic-resistant bacteria. Bacteriophages were likely first reported in 1896 when Ernest Hanbury Hankin described something in the waters of the Ganges and Yamuna rivers in India with antibacterial action that could pass through a very fine porcelain filter. We will be in the heart of both antibiotic resistance emergence and bacteriophage history, while enjoying the rich and ancient history, art and culture of India.

The study abroad will begin by meeting in Paris from which we will fly together to New Delhi. Program travel will also include visits to the cities of Jaipur, Agra, Gwalior. Experiences will include visits to the Jama Masjid (India's largest Mosque), the Raj Ghat (the cremation site of Mahatma Gandhi), the Amer Fort – the original capital of State, Maharaja's City palace and garden, the Taj Mahal, Abhaneri (stair-wells invented to harvest rain water), the Mitawali temple, Garhi padawali, and the Bateswara group of temples.

## **DATES**

24 April - 17 May 2022 (approximately)

## **HOUSING**

Students will stay in hotels in Paris and New Delhi and apartments in Gwalior. Accommodations will also be provided during outings to the Ganges river. Most, but not all, meals will be provided on the program.

The program cannot meet all special dietary needs nor can it ensure a safe environment for those with food allergies. If you have dietary or allergy concerns we recommend that you speak with the International Study Programs office before you apply.

## **COURSES**

Students are required to enroll in 6 credit hours during the Spring Term experience.

Students are required to take MMBIO 471 – Applied and Industrial Microbiology (2 credits), MMBIO 390R – Readings in Microbiology (1 credit) and may choose from LFSCI 399R for 3 credit hours, or internship credit from their academic department.

Note: LFSCI 399R is for Life Sciences majors only and requires prior approval. Life Sciences interns may read the syllabi and apply at [lifesciences.byu.edu/internships](http://lifesciences.byu.edu/internships). Students will need to contact Gale Larson, Internships Coordinator in the College of Life Sciences to discuss internship requirements prior to Winter Semester 2022

Participants may not take any other courses on this program, including BYU Online courses, without approval by the program director and ISP.

## **COST**

\$3,700–4,200

Includes BYU Latter-day Saint undergraduate tuition, round-trip airfare between Paris and New Delhi, accommodations, some meals, group transportation between cities cultural excursions, and international health insurance.

Does not include round-trip airfare between the continental U.S. and Paris, some meals, and personal spending money, international phone plans.

## **TRAVEL**

Students are responsible for purchasing their own airfare to and from the program. Airfare reservations must be made through BYU Travel. Students should contact a BYU Travel agent. BYU Travel | 801-422-6293 | [travel@byu.edu](mailto:travel@byu.edu) | 280 HRCB

## **PREPARATION**

Accepted students are required to participate in a preparation course (IAS 369R 1 credit hour). This course will be held during second block, winter semester 2022.

Accompanying spouses need to be credit-bearing participants on the program.

Spouses will also need to apply online and take the preparation course.

All participants are required to show proof of complete COVID-19 vaccination (including booster) at least two weeks prior to departure.

## **FUNDING SOURCES**

Regular BYU tuition scholarships, Pell Grants, and Federal Insured Student Loans may be applied to study abroad programs. Students who submit the financial aid section of the ISP application and who have a current FAFSA form on file at the Financial Aid Office (A-41 ASB) will be considered for a Study Abroad scholarship. Academic departments and colleges may assist with scholarships and grants. Private grants and scholarships outside of BYU may also assist (see [kennedy.byu.edu/scholarships](http://kennedy.byu.edu/scholarships))

## **APPLICATION PROCESS**

Students must be adults 18 years of age or older. Complete the online application at [kennedy.byu.edu/apply](http://kennedy.byu.edu/apply). The application requires a \$35 fee. Students will be notified via e-mail of their acceptance into the program. The first payment is due upon acceptance. Please refer to the 2021 Payment Information document (see [kennedy.byu.edu/isp-forms/ISPpayments2021.pdf](http://kennedy.byu.edu/isp-forms/ISPpayments2021.pdf)).

**Deadline: 15 December 2021**

## **FACULTY**

Julianne H Grose PhD, Associate Professor, Department of Microbiology and Molecular Biology: Professor Grose is the overall director of this research effort and will administer the research program. Professor Grose will teach the prep course and will direct the program in India and at BYU.

Richard Robison, Professor, Department of Microbiology and Molecular Biology. Professor Robison will serve as a scientific advisor and resource and will lead some discussions in the study abroad prep course.

## **INTERESTED STUDENTS SHOULD CONTACT**

International Study Programs | 101 HRCB | (801) 422-3686 | [isp@byu.edu](mailto:isp@byu.edu) | [kennedy.byu.edu/isp](http://kennedy.byu.edu/isp)

## **PROGRAM ADJUSTMENTS**

International Study Programs (ISP) reserves the right to cancel this program, revise its offerings, or make any adjustments to the preliminary cost. If it becomes necessary for ISP to cancel a program, all program payments made to BYU ISP will be refunded to the student's BYU financial account. ISP is the only office authorized to cancel any of its programs.