Master's Degree in Developmental Origins of Health & Disease

USC Dornsife
Department of Biological Sciences

a joint endeavor with

Children's Hospital LOS ANGELES

What was our childhood environment like? Did we grow up near a highway? Were we exposed to strife and disease? What about the lives of our caregivers? Or our great-grandparents, who went through war and famine? Our adult bodies keep the score. They reflect what has happened to us, our parents, even our distant ancestors.

In USC's new Developmental Origins of Health & Disease (DOOHD) program, a joint endeavor with Children's Hospital of Los Angeles (CHLA), our researchers look to the past to help predict future health outcomes. With the knowledge that nature is only part of the story, and that the environment activates our DNA, our faculty investigate what turns on genes and how these changes are passed down — not just from parent to child, but also from grandparent to grandchild. Researchers examine everything from the complex in utero environment to the role of childhood nutrition in those predisposed to diabetes to the harmful effects of early exposure to toxins.

Students in the program will study alongside our researchers using the latest cutting-edge molecular genetic techniques, A.I., data analysis, and other contemporary methods to answer fundamentally important questions about how and when disease arises. The alliance between the program and CHLA will also give students close contact with the more human aspects of research, like the role of bedside manner in treatment and the importance of how a patient talks about their symptoms. And with its social and economic disparities, oil legacy, and air and sea pollution, Los Angeles is an advantageous place to ask and answer questions about the role the environment plays on the developing human body.

DOOHD Program Learning Objectives:

- Develop a detailed understanding of the molecular mechanisms that affect lifelong health.
- Appreciate the contribution of environmental and social factors to health across generations.
- Learn the principles and methods of epidemiology, and how to explain them.
- Understand human development and reproduction in both biological and sociological perspectives.
- Articulate principles of environmental, social, and reproductive justice.
- Develop protocols to prevent or cure non-communicable diseases.
- Develop arguments for policies that promote health equity.
- Learn to think critically, gather relevant data, manage research projects, analyze data, and report findings to solve challenging interdisciplinary problems related to developmental origins of health & disease.
- Work side-by-side with leading USC and CHLA faculty in hands-on lab research, lab meetings, and data presentations.
- Learn to evaluate and critique scientific literature.
- Organize, analyze, and interpret raw data and effectively communicate the results to health professionals and the public.

CORE COURSES

Course	Units
BISC 550A Developmental Origins of Health & Disease	4
BISC 550B Developmental Origins of Health & Disease	4
BISC 552 Bioethics, Health Policy and Human Development	2
BISC 555 Epidemiology of Developmental Origins of Disease	1
BISC 556 Developmental Nutrition and Lifelong Health	1
BISC 557 Emerging Technologies for the Study of Health and Disease	2
BISC 559 DOOHD Seminar Series	4

RESEARCH REQUIREMENTS (12 UNITS)

Course	Units
BISC 558A Capstone Research Project	2
BISC 558B Capstone Research Project	2
BISC 558C Capstone Research Project	8

WRITING AND COMMUNICATION REQUIREMENTS (2 UNITS)

Course	Units
JOUR 510 Communicating Your Health Story	2

Students will be provided with:

An excellent educational and research experience.

An opportunity to interact with faculty on a broad range of cutting-edge research topics in developmental origins of health and disease.

Hands-on training to learn techniques for conducting research in the lab of a CHLA or USC faculty member.

Exposure to the national and international developmental biology and regenerative medicine research community through seminars and symposia.

Please contact Dr. Rusty Lansford (lansford@usc.edu) if you have any questions.

Program Description & Degree Requirements:

A minimum grade point average of 3.0 must be earned on all coursework applied toward the Master of Science in the DOOHD program. This average must also be achieved on all 400-level and above course work attempted at USC and CHLA beyond the bachelor's degree and through an accumulation of no more than 10 units beyond the minimum needed for the specific degree program. Transfer units count as credit (CR) toward the master's degree and are not computed in the grade point average.

The Master of Science in Developmental Origins of Health & Disease is subject to the following requirements: (1) a total of at least 32 units is required, selected from the courses above; (2) courses outside the lists presented above require approval from the program advisor; (3) at least 22 units must be taken at the 500- or 600-level and no courses below the 400-level; (4) 2-8 units of BISC 490X (Directed Research), may be counted toward the DOOHD; (5) 2 units of BISC 559 (seminar class) may be counted toward the DOOHD; (6) units to be transferred (maximum 4 with adviser approval) must have been taken prior to taking classes at USC or CHLA.

Molecular, cellular, developmental biology, and epidemiology are the foundations of the joint USC-CHLA Master's program. Students complete 32 credits of graduate level courses and gain hands-on experience in the lab and clinical setting. After completing required course credits, students may choose the remaining credits from a wide range of elective courses to fulfill the degree program.

Students have the opportunity for interdisciplinary studies jointly hosted by a major research university and children's hospital taught by world-renowned faculty. The DOOHD program provides outstanding preparation for future work in academic, medical and bioscience industry settings.

How to Apply:

Submit your application and supporting documents to: **gradadm.usc.edu/apply/**

Financial aid

Students admitted into the MS in Developmental Origins of Health & Disease program must apply for financial aid through the main USC Financial Aid Office, which offers low-interest student loans and administers the federal work-study program.

Students can apply for several competitive university and external fellowships and awards through the USC Graduate School.