Irell & Manella Graduate School of Biological Sciences
at City of Hope

MASTER OF SCIENCE IN TRANSLATIONAL MEDICINE (MSTM)

A Joint Program with Keck Graduate Institute (KGI)

Student Handbook
2022-2023

BECKMAN RESEARCH INSTITUTE

IRELL & MANELLA GRADUATE SCHOOL
OF BIOLOGICAL SCIENCES

Contents

INTRODUCTION

City of Hope was founded in 1913, in Duarte, California, by working-class men and women who believed in helping those less fortunate than themselves. Although initially a tuberculosis sanatorium, research programs were initiated at City of Hope in 1951 and expanded rapidly until by the late 1970s approximately 130 PhD-level investigators were conducting a broad range of research programs throughout the institute.

In 1983, Beckman Research Institute of the City of Hope was established with generous support from the Arnold and Mabel Beckman Foundation. The Institute is comprised of basic science research groups within the departments of Cancer Biology; Cancer Genetics and Epigenetics; Developmental and Stem Cell Biology; Diabetes and Metabolic Diseases Research; Experimental Therapeutics; Immuno-Oncology; Information Sciences; Lymphoma SPORE; Molecular Immunology; Molecular and Cellular Biology; Molecular Medicine; and Population Sciences.

City of Hope has a long and impressive history of groundbreaking discoveries in the field of diabetes. In 2016 the Diabetes & Metabolism Research Institute was founded. The institute is comprised of the following departments and programs: Clinical Diabetes, Endocrinology & Metabolism; Diabetes Complications & Metabolism; Diabetes Immunology; Molecular & Cellular Endocrinology; Translational Research & Cellular Therapeutics, and The Wanek Family Project for Type 1 Diabetes.

Hematologic cancers are those cancers that occur in cells of the immune system or in bloodforming tissues, including bone marrow. As a pioneer in advancing care for all hematologic cancers and related blood disorders, City of Hope's Hematologic Malignancies and Stem Cell Transplantation Institute leads the field as one of the largest and most successful transplant centers in the world. The institute also houses the Gehr Family Center for Leukemia Research, the Toni Stephenson Lymphoma Center, the Judy and Bernard Briskin Center for Multiple Myeloma Research, the Center for Gene Therapy, the Center for Stem Cell Transplantation, the Survivorship Center and the Center for T Cell Transplantation.

City of Hope’s innovative research programs continue to evolve and grow in many promising areas, including production of functional human hormones, radioimmunotherapy, neurosciences, stem cell research, and gene therapy.

City of Hope is a pioneer in the field of hematopoietic cell transplantation, and research into this therapy has been supported by a National Cancer Institute/National Institutes of Health program project grant since 1981. The Hematopoietic Cell Transplantation program provides opportunities for basic science investigations, as well as developing mechanisms for delivery of genetic material and novel therapeutic agents.

Chemically synthesized genes produced in the Biology Division were used to develop the first recombinant human peptide hormone which led to the commercial production of human insulin (Humulin, now used by millions of people with diabetes worldwide).
The study of monoclonal antibodies against the cancer antigen CEA (carcinoembryonic antigen) led to establishment of the Radioimmunotherapy Program. Genetically engineered antibodies carrying radioactive isotopes are being used in cancer therapy trials and in studies designed to localize tumors in patients. The humanized monoclonal antibodies developed at City of Hope made possible the “smart” cancer drugs such as Herceptin, Rituxan, and Avastin, which are saving and extending lives.

Recent advances in neurosciences programs include the gene therapeutic “rescue” of neurotransmitter-deficient fruit flies; the discovery of necessary interaction between extracellular matrix molecules and neurotransmitter receptor gene expression; the identification of a motor neuronal-specific antigen that may be involved in the maintenance and regeneration of neuromuscular junctions; and the development of an organotypic spinal cord culture, valuable in studying nervous system development.

MISSION STATEMENT

The mission of the Irell & Manella Graduate School of Biological Sciences at City of Hope is to train students in an academically stimulating, collaborative, and diverse environment to apply their creativity, curiosity and talents to advance understanding of the complexities of the life sciences and to apply research discoveries toward finding cures for disease.

MESSAGE FROM THE DEAN

City of Hope and Beckman Research Institute (which hosts the Irell & Manella Graduate School of Biological Sciences) have a remarkable history of innovation in science and medical care. Our faculty members have made major contributions in biological sciences and biomedicine and are widely recognized as leaders in their fields. The biotech industry was launched by investigators at City of Hope when they created the technology that led to the first human recombinant gene products, insulin and human growth hormone, which are now in use by millions of people worldwide. The most recent class of blockbuster drugs, humanized monoclonal antibodies, is based upon a core technology developed by Beckman Research Institute researchers. Both basic science and translational biomedical research flourish here, in a collegial atmosphere where cross-communication thrives, and basic science findings are often applied to the cure of life-threatening diseases.

The graduate school enrolled its first class of Ph.D. students in Biological Sciences in 1994. Our graduates have gone on to academic appointments and postdoctoral fellowships at some of the nation's best universities, as well as to positions in major biotech and pharmaceutical companies. City of Hope's interdisciplinary research programs provide students with many opportunities to enrich their graduate education by interacting with other graduate students, postdoctoral fellows and faculty members outside of their own areas of specialization. In 2021, the graduate school expanded the scope of our doctoral training with a second Ph.D. program in Translational Medicine. City of Hope has a strong track record in training both predoctoral students and postdoctoral fellows. In 2018 and 2022, the graduate school initiated new joint master's programs in translational medicine and regulatory affairs with the Henry E. Riggs School of Applied Life Sciences at Keck Graduate Institute. In addition, we host undergraduate and high school researchers in our extensive summer internship program.

Welcome to the Irell & Manella Graduate School of Biological Sciences.

MESSAGE FROM THE PROGRAM CO-DIRECTORS

Keck Graduate Institute (KGI) and City of Hope have a remarkable history of innovation in science and medical care. Our faculty members have made major contributions in translational research and biomedicine, and are widely recognized as leaders in their fields. This program joins two great innovators KGI, dedicated to application-based scientific research and education, and City of Hope, an institution that helped establish the biotechnology industry.

KGI was established in response to a call by our nation's leaders to rethink higher education and embrace an interdisciplinary education. Bringing together engineering, the life sciences and business, with an emphasis on professional degrees prepares students for careers in clinical and regulatory affairs, pharmaceuticals, bioinstrumentation, medical devices, and biotechnology. The broad, interdisciplinary approach to science education makes KGI graduates of great potential value to a broad range of biotech industry companies and to governmental agencies and nonprofit organizations that are tasked with regulatory responsibilities and the advancement of safe and effective medicines and medical products.

City of Hope helped launch the biotechnology industry by investigators creating the technology that led to the first human recombinant gene products, insulin and human growth hormone, which are now used by millions of people worldwide. The most recent class of blockbuster drugs, humanized monoclonal antibodies, is based upon a core technology developed by Beckman Research Institute researchers. Both basic science and translational biomedical research flourish here, in a collegial atmosphere where cross-communication thrives and basic science findings are often applied to the cure of life-threatening diseases.

We welcomed our inaugural class in 2018 and look forward to the growth of this program. We know that the partnership between the Henry E. Riggs School of Applied Life Sciences at KGI and the Irell & Manella Graduate School of Biological Sciences (IMGS) at City of Hope will serve as a great stepping stone to a variety of research careers for our graduates. The Master of Science in Translational Medicine (MSTM) degree will open the door to careers in biotechnology, pharmaceutical industry, clinical or academic laboratories, as well as doctoral research or medical education.

Yilun Liu, Ph.D.
Irell & Manella
Graduate School of Biological Sciences
City of Hope

Anastasia Levitin, Ph.D.
Henry E. Riggs
School of Applied Life Sciences
Keck Graduate Institute

PROGRAM LEARNING OUTCOMES

- Generate hypothesis and perform hypothesis-driven research
- Design research and methodology, analyze and report data results
- Assess the literature, identify knowledge gaps and convey findings to the scientific community
- Plan the translation of basic science and engineering discoveries into products and processes that benefit society
- Communicate effectively in an industry environment composed of scientists, engineers and business professionals
- Adhere to ethical principles in research, development and business issues inherent in the bioscience industries
- Tackle complex problems and contribute productively on an interdisciplinary team

PROGRAM OVERVIEW

The MSTM program is a two-year Master's program. This program is aimed at providing students with an applied research experience and an in-depth understanding of how to translate basic research into medical products from the perspectives of both academic research (discovery) and downstream commercial development. Graduates will be uniquely positioned to begin careers in biotechnology/pharmaceutical industry, clinical or academic laboratories, or pursue further education at the doctoral level, medical education or both.

MSTM students will enroll as full-time students in both the Henry E. Riggs School of Applied Life Sciences at KGI and the Irell & Manella Graduate School of Biological Sciences at City of Hope throughout the entire two-year program. During the first year, students will spend 90 percent of their academic hours at KGI, where they will take a series of core and advanced courses that emphasize the process of taking our basic science discovery at the bench side to therapeutic development at the bedside. The courses will cover fundamental and advanced molecular biology techniques (Molecular Biotechnology, Fundamental Papers in Applied Medicine); population genetics in human diseases (Molecular Basis of Disease, Pharmacogenomics and Precision Medicine); drug target discovery and development (Pharmaceutical Discovery, Pharmaceutical Development, Advanced Pharmaceutical Discovery with Lab); statistical analysis for clinical trials (Application of statistics, Clinical Biostatistics); professional development (Professional Development; Healthcare and Life Sciences Industry Ethics; Business/Science Communication); and Elective. In addition to classes at KGI, students will go through advanced technical trainings conducted by the core facilities of City of Hope (Flow Cytometry, Microscopy and Digital Imaging, Integrative Genomic and Bioinformatics, Mass Spectrometry & Proteomics, Animal Model and 3d Tumor Imaging Center). MSTM students will also attend roundtable discussions with City of Hope faculty and visit laboratories to learn about available City of Hope research topics (Independent Research). By the end of the first year, the students will identify a suitable thesis mentor and will spend the second year at City of Hope to conduct their thesis research. Throughout the entire two years of the program, students will also go through rigorous training in scientific writing and research presentation.

GRADUATE SCHOOL ADMINISTRATION

Irell & Manella Graduate School of Biological Sciences at City of Hope:

Dean, David Ann, Ph.D.

Vice Dean & Co-Director of MSTM/MSRA Programs, Yilun Liu, Ph.D.

Director of Assessment and Development, Susan Neuhausen, Ph.D.

Director of Ph.D. Administration and Admissions, Markus Kalkum, Ph.D.

Director of Ph.D. Curriculum, Jeremy Stark, Ph.D.

Director of the Postdoctoral Training Office, Mark LaBarge, Ph.D.

Associate Director of MSTM/MSRA Program, Ke Ma, Ph.D.

Associate Director of Ph.D. Admissions, Tijana Jovanovic-Talisman, Ph.D.

Assistant Director of Admissions and Recruitment, Glenn Manthey, Ph.D.

Registrar, Tracy Kurzy, MBA, MEd

Business Manager, Elizabeth Castaneda

Supervisor, Business Operations, Sarah Bannister

Postdoctoral Program Manager, Stephanie Alexander

Administrative Assistant, Marina Sanchez

Henry E. Riggs School of Applied Life Sciences at KGI:

Dean, Megan Prosser, Ph.D.

Co-Director of MSTM Program, Anastasia Levitin, Ph.D.

Administrative Assistant, Leslie Contreras

MSTM PROGRAM LEADERSHIP AND COMMITTEE

The MSTM program is jointly led by the Irell & Manella Graduate School of Biological Sciences at City of Hope and the Henry E. Riggs School of Applied Life Sciences at KGI Co-Directors. The program Co-Directors are:

Yilun Liu, Ph.D.
Vice Dean, Irell & Manella School of Biological Sciences
Professor & Associate Chair, Department of Cancer Genetics and Epigenetics
Beckman Research Institute
City of Hope

Anastasia Levitin, Ph.D.
Professor of Practice in Translational Medicine
Henry E. Riggs School of Applied Life Sciences
Keck Graduate Institute

The MSTM Co-Directors oversee the needs and development of this joint program. At City of Hope, the MSTM Admissions Committee is co-chaired by the City of Hope's Co-Director and the Associate Director of MSTM Program. The MSTM Admissions Committee at City of Hope works closely with KGI's MSTM committee on admission decisions and curriculum design. The MSTM program is assessed by the Assessment Sub-Committee under the guidance of Director of Assessment and Development.

MSTM ADMISSIONS COMMITTEE at CITY OF HOPE

Yilun Liu, Ph.D. (co-chair)
Ke Ma, Ph.D. (co-chair)
Sangeeta Dhawan, Ph.D.
Patrick Fueger, Ph.D.
Lei Jiang, Ph.D.
Jeannine McCune, Pharm.D.
Mustafa Raoof, M.D.
Hung-Ping (Ben) Shih, Ph.D.
Sarah Shuck, Ph.D.
Srividya Swaminathan, Ph.D.
Yanzhong (Frankie) Yang, M.D., Ph.D.

MSTM RESEARCH MENTORS 2022-2023

#	Name	Appointment Year	Professional Training	Title	Department
1.	Karen Aboody, M.D.	2003	Mount Sinai School of Medicine	Professor	Stem Cell Biology & Regenerative Medicine
2.	David Ann, Ph.D.	2006	Purdue University	Professor	Diabetes Complications & Metabolism
3.	Saro Armenian, DO	2008	Western University	Professor	Pediatrics & Population Sciences
4.	Kimlin Ashing, Ph.D.	2006	University of Colorado	Professor	Population Sciences
5.	Benham Badie, M.D.	2015	UC Los Angeles	Professor	Surgery
6.	Nicholas Banovich, Ph.D.	2021	University of Chicago	Associate Professor	Translational Genomics Research Institute (TGen)
7.	Michael Barish, Ph.D.	1989	Stanford University	Professor	Stem Cell Biology & Regenerative Medicine
8.	Leslie Bernstein, Ph.D.	2007	UCLA	Professor	Population Sciences
9.	Andrea Bild, Ph.D.	2017	University of Colorado	Professor	Medical Oncology & Therapeutics Research
10.	Mark Boldin, M.D., Ph.D.	2011	Weizmann Institute of Science (Israel)	Associate Professor	Systems Biology
11.	Sergio Branciamore, Ph.D.	2018	University of Florence	Assistant Professor	Computational & Quantitative Medicine
12.	Charles Brenner, Ph.D.	2020	Stanford University	Professor	Diabetes & Cancer Metabolism
13.	Christine Brown, Ph.D.	1998	UC Berkeley	Professor	Hematology & Hematopoietic Cell Transplantation
14.	Elizabeth Lihua Budde, M.D., Ph.D.	2013	Duke University	Associate Professor	Hematology & Hematopoietic Cell Transplantation
15.	John Burnett, Ph.D.	2008	UC Berkeley	Assistant Professor	Center for Gene Therapy

#	Name	Appointment Year	Professional Training	Title	Department
16.	Michael Caligiuri, M.D.	2018	Stanford University School of Medicine	Physician-in-Chief Distinguished Chair	Hematopoietic Cell Transplantation
17.	Edouard Cantin, Ph.D.	1983	University of Cambridge	Professor Emeritus	Immunology & Theranostics
18.	Angelo Cardoso, M.D., Ph.D.	2016	University Paris-Sud, France	Research Professor	Center for Gene Therapy
19.	Nadia Carlesso, M.D., Ph.D.	2016	University of Turin, University of Genova	Professor	Stem Cell Biology & Regenerative Medicine
20.	Wing-Chun (John) Chan, M.D.	2013	University of Hong Kong	Professor	Pathology
21.	Saswati Chatterjee, Ph.D.	1991	Georgetown University	Professor	Surgery
22.	Chun-Wei (David) Chen, Ph.D.	2017	University of Rochester	Associate Professor	Systems Biology
23.	Jianjun Chen, Ph.D.	2018	Shanghai Institute of Biochemistry, Chinese Academia of Sciences	Professor	Systems Biology
24.	Mike Y. Chen, M.D., Ph.D.	2015	Thomas Jefferson University/ Medical College of Virginia	Associate Professor	Surgery
25.	Shiuan Chen, Ph.D.	1985	University of Hawaii	Professor	Cancer Biology
26.	Wenyong Chen, Ph.D.	2005	University of Alabama	Associate Professor	Cancer Biology
27.	Zhen Chen, B.Med, Ph.D.	2016	UC Riverside	Associate Professor	Diabetes Complications & Metabolism
28.	Alexey Danilov, M.D., Ph.D.	2020	Yaroslavl Medical Academy	Professor	Hematology & Transplantation

#	Name	Appointment Year	Professional Training	Title	Department
29.	Thanh Dellinger, M.D.	2015	UC Irvine	Associate Professor	Surgery
30.	Yingfeng Deng, Ph.D.	2021	Albert Einstein College of Medicine	Assistant Professor	Diabetes & Cancer Metabolism
31.	Sangeeta Dhawan, Ph.D.	2017	Indian Institute of Science, Bangalore	Assistant Professor	Translational Research & Cellular Therapeutics
32.	Don Diamond, Ph.D.	1989	Harvard University	Professor	Hematology & Hematopoietic Cell Transplantation
33.	Richard Ermel, Ph.D., D.V.M., M.P.V.M	2002	UC Davis	Professor	Center for Comparative Medicine
34.	Marwan Fakih, M.D.	2012	American University of Beirut, Lebanon	Professor	Medical Oncology & Therapeutics Research
35.	Mingye Feng, Ph.D.	2018	Johns Hopkins University	Associate Professor	Immuno-Oncology
36.	Betty Ferrell, Ph.D.	1989	Texas Women's University	Professor	Nursing Research & Education/ Population Sciences
37.	Yuman Fong, M.D.	2016	Weill Cornell Medical College	Professor	Surgery
38.	Stephen Forman, M.D.	1979	University of Southern California	Professor	Hematopoietic Cell Transplantation
39.	Patrick Fueger, Ph.D.	2016	Vanderbilt University	Associate Professor	Molecular & Cellular Endocrinology
40.	Carlotta Glackin, Ph.D.	1993	University of Southern California	Associate Professor Emeritus	Stem Cell Biology & Regenerative Medicine
41.	Ajay Goel, Ph.D.	2019	Panjab University	Professor	Molecular Diagnostics, Therapeutics
42.	Stacy Gray, M.D.	2016	University of Chicago	Associate Clinical Professor	Medical Oncology & Therapeutics Research, Clinical Cancer Genomics
43.	Steven Gruber, M.D., Ph.D.	2019	University of Pennsylvania Medical School	Professor	Medical Oncology & Therapeutics Research

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44.	Zhaohui Gu, Ph.D.	2020	Shanghai Jiao Tong University	Assistant Professor	Computational & Quantitative Medicine
45.	Nora Heisterkamp, Ph.D.	2017	University of Rotterdam	Professor	Systems Biology
46.	Robert J. Hickey Ph.D.	2011	City University New York	Associate Professor	Molecular Medicine
47.	David Horne, Ph.D.	2006	Massachusetts Institute of Technology	Professor	Molecular Medicine
48.	Wendong Huang, Ph.D.	2006	University of Texas Health Sciences Center	Professor	Diabetes Complications & Metabolism Research
49.	Susanta Hui, Ph.D.	2016	University of Calcutta	Professor	Radiation Oncology
50.	Keiichi Itakura, Ph.D.	1974	Tokyo College of Pharmacy	Professor Emeritus	Center for RNA Biology & Therapeutics
51.	Rahul Jandial, M.D., Ph.D.	2008	UC San Diego	Associate Professor	Surgery
52.	Marta Jankowska, Ph.D.	2021	San Diego State University	Associate Professor	Population Sciences
53.	Lei Jiang, Ph.D.	2017	Shanghai Institutes for Biological Sciences	Assistant Professor	Molecular & Cellular Endocrinology
54.	Tijana Jovanovic-Talisman, Ph.D.	2013	Columbia University	Associate Professor	Molecular Medicine
55.	John Kaddis, Ph.D.	2015	University of Southern California	Assistant Professor	Diabetes & Cancer Discovery Science
56.	Michael Kahn, Ph.D.	2018	Yale University	Professor	Molecular Medicine
57.	Markus Kalkum, Ph.D.	2003	Free University of Berlin	Professor	Immunology & Theranostics
58.	Fouad Kandeel, M.D., Ph.D.	2008	Cairo University	Professor	Clinical Diabetes, Endocrinology & Metabolism

#	Name	Appointment Year	Professional Training	Title	Department
59.	Marcin Kortylewski, Ph.D.	2005	Univ. School of Medical Sciences	Professor	Immuno-Oncology
60.	Hsun Teresa Ku, Ph.D.	2007	Medical University South Carolina	Associate Professor	Translational Research & Cellular Therapeutics Research
61.	Ya-Huei Kuo, Ph.D.	2008	University of Connecticut	Associate Professor	Hematologic Malignancies Translational Science
62.	Larry W. Kwak, M.D., Ph.D.	2015	Northwestern University	Professor	Hematology & Hematopoietic Cell Transplantation
63.	Mark LaBarge, Ph.D.	2016	Stanford University	Professor	Population Sciences
64.	James Lacey, Ph.D., M.P.H.	2009	University of Michigan	Professor	Computation & Quantitative Medicine
65.	Keane Lai, M.D.	2018	University of Pittsburgh	Assistant Professor	Molecular Medicine
66.	Kyuwan Lee, Ph.D.	2020	University of Southern California	Assistant Professor	Population Sciences
67.	Peter Lee, M.D.	2011	UC San Diego	Professor	Immuno-Oncology
68.	Ling Li, Ph.D.	2018	Zhejiang University	Associate Professor	Hematological Malignancies Translational Science
69.	Yun (Rose) Li, M.D., Ph.D.	2022	University of Pennsylvania	Assistant Professor	Radiation Oncology
70.	Ren-Jang Lin, Ph.D.	1993	Pennsylvania State University	Professor	Center for RNA Biology & Therapeutics
71.	Yilun Liu, Ph.D.	2011	Yale University	Professor	Cancer Genetics & Epigenetics
72.	Qiang Lu, Ph.D.	2002	UC San Diego	Professor	Stem Cell Biology & Regenerative Medicine
73.	Ke Ma, Ph.D.	2018	Baylor College of Medicine	Associate Professor	Diabetes Complications & Metabolism
74.	Ellie Maghami, M.D.	2004	Washington University School of Medicine at St. Louis	Professor	Surgery

#	Name	Appointment Year	Professional Training	Title	Department
75.	Linda Malkas, Ph.D.	2011	City University of New York	Professor	Molecular Diagnostics & Experimental Therapeutics
76.	Edwin Manuel, Ph.D.	2015	Harvard University	Assistant Professor	Immuno-Oncology
77.	Guido Marcucci, M.D.	2016	Catholic University of Sacred Heart, Rome	Professor	Hematologic Malignancies Translational Science
78.	Jeannine McCune, Pharm.D.	2017	University of North Carolina	Professor	Hematologic Malignancies Translational Science
79.	Heather McGee, M.D. Ph.D.	2021	Yale University	Assistant Professor	Radiation Oncology
80.	Marcia Miller, Ph.D.	1975	UC Los Angeles	Professor Emeritus	Center for RNA Biology & Therapeutics
81.	Jose Enrique Montero Casimiro, M.D.	2019	Havana University	Research Professor	Diabetes Immunology
82.	Rama Natarajan, Ph.D.	1990	Indian Institute of Science	Professor	Diabetes Complications & Metabolism
83.	Susan Neuhausen, Ph.D.	2009	University of Minnesota	Professor	Population Sciences
84.	Edward Newman, Ph.D.	1981	Yale University	Associate Professor Emeritus	Medical Oncology & Therapeutics Research
85.	Vu Nguyen Ngo, Ph.D.	2010	UC San Francisco	Associate Professor	Systems Biology
86.	Joyce Niland, Ph.D.	1988	University of Southern California	Professor	Diabetes & Cancer Discovery Science
87.	Timothy O'Connor, Ph.D.	1996	Purdue University	Professor Emeritus	Cancer Biology
88.	Javier Gordon Ogembo, Ph.D.	2018	Nagoya University	Associate Professor	Immuno-Oncology
89.	Sumanta Kumar Pal, M.D.	2009	UCLA David Geffen School of Medicine	Professor	Medical Oncology & Therapeutic Research

#	Name	Appointment Year	Professional Training	Title	Department
90.	Sunita Patel, Ph.D.	2003	Alliant University	Associate Clinical Professor	Population Sciences
91.	Jeff Perry, Ph.D.	2021	University of Cambridge UK	Assistant Professor	Molecular Diagnostics, Therapeutics & Translational Oncology
92.	Flavia Pichiorri, Ph.D.	2016	University of Rome	Professor	Hematologic Malignancies Translational Science
93.	Saul Priceman, Ph.D.	2019	UC Los Angeles	Assistant Professor	Hematology & Hematopoietic Cell Transplantation
94.	Christiane Querfeld, M.D., Ph.D.	2016	University of Cologne, University of Heidelberg	Associate Professor	Surgery
95.	Mustafa Raoof, M.D.	2015	Aga Khan University, Pakistan	Assistant Clinical Professor	Surgery
96.	Dan J. Raz, M.D.	2012	University of Pennsylvania	Associate Clinical Professor	Surgery
97.	Anne Reb, Ph.D., N.P.	2016	Catholic University of America	Assistant Professor	Population Sciences
98.	Helena Reijonen, Ph.D.	2018	University of Turkey	Associate Professor	Immunology & Theranostics
99.	Russell C. Rockne, Ph.D.	2013	University of Washington, Seattle	Associate Professor	Computational & Quantitative Medicine
100.	Andrei S. Rodin, Ph.D.	2013	University of Texas, Houston	Professor	Computational & Quantitative Medicine
101.	Steven Rosen, M.D.	2016	Northwestern University	Provost	Hematopoietic Cell Transplantation
102.	John Rossi, Ph.D.	1996	University of Connecticut	Professor	Center for RNA Biology & Therapeutics
103.	Ravi Salgia, M.D., Ph.D.	2018	Loyola University School of Medicine	Professor	Medical Oncology & Therapeutics Research
104.	Dustin E. Schones, Ph.D.	2010	SUNY Stony Brook	Associate Professor	Diabetes Complications & Metabolism

#	Name	Appointment Year	Professional Training	Title	Department
105.	Mina Sedrak, M.D.	2016	Rush Medical College	Assistant Professor	Medical Oncology & Therapeutics Research
106.	Victoria Seewaldt, M.D.	2015	UC Davis	Professor	Population Sciences
107.	Binghui Shen, Ph.D.	1996	Kansas State University	Professor	Cancer Genetics & Epigenetics
108.	Yanhong Shi, Ph.D.	2004	Northwestern University	Professor	Stem Cell Biology & Regenerative Medicine
109.	Ben Hung-Ping Shih, Ph.D.	2015	Oregon State University	Associate Professor	Diabetes & Metabolic Diseases Research
110.	John E. Shively, Ph.D.	1975	University of Illinois	Professor	Immunology & Theranostics
111.	Sarah Shuck, Ph.D.	2021	Indiana University School of Medicine	Assistant Professor	Diabetes & Cancer Metabolism
112.	Christopher Sistrunk, Ph.D.	2016	North Carolina State University	Assistant Professor	Population Sciences
113.	Jeremy Stark, Ph.D.	2006	University of Washington	Professor	Cancer Genetics & Epigenetics
114.	Virginia Sun, Ph.D., R.N.	2002	UCLA	Associate Professor	Population Sciences
115.	Zuoming Sun, Ph.D.	2005	Duke University	Professor	Immunology & Theranostics
116.	Zijie (ZJ) Sun, Ph.D. Dsc	2016	Shanghai Medical University	Professor	Cancer Biology
117.	Srividya Swaminathan, Ph.D.	2019	University of Southern California	Assistant Professor	Systems Biology
118.	Timothy Synold, Pharm.D.	1994	UC San Francisco	Professor	Cancer Biology
119.	John Termini, Ph.D.	1998	Columbia University	Professor	Molecular Medicine
120.	Debbie C. Thurmond, Ph.D.	2015	University of Iowa	Professor	Molecular & Cellular Endocrinology
121.	Christian Tomasetti, Ph.D.	2022	University of Maryland	Professor	Translational Genomics Research Institute (TGen)

#	Name	Appointment Year	Professional Training	Title	Department
122.	Lindsey Treviño, Ph.D.	2018	Cornell University	Assistant Professor	Population Sciences
123.	Nagarajan Vaidehi, Ph.D.	2005	India Institute of Technology	Professor	Computational & Quantitative Medicine
124.	Rupangi Vasavada, Ph.D.	2018	University of Pennsylvania	Associate Professor	Translational Research & Cellular Therapeutics
125.	Edward Wenge Wang, M.D., Ph.D.	2018	Harbin Medical University	Assistant Professor	Medical Oncology &
126.	Leo Wang, M.D., Ph.D.	2017	University of Chicago	Assistant Professor	Immuno-Oncology
127.	Lili Wang, M.D., Ph.D.	2018	China Medical University/ Tokai University	Associate Professor	Systems Biology
128.	Ping Wang, M.D.	2020	Kaohsiung Medical College, Taiwan	Professor	Diabetes, Endocrinology & Metabolism
129.	Qiong (Annabel) Wang, Ph.D.	2009	The University of Chinese Academy of Sciences	Associate Professor	Molecular & Cellular Endocrinology
130.	Sophia Wang, Ph.D.	2013	Johns Hopkins University	Professor	Population Sciences
131.	Xiuli Wang, Ph.D.	2019	Inner Mongolia Medical University /University of Oslo	Professor	Hematology & Hematopoietic Cell Transplantation
132.	Zhao Wang, Ph.D.	2021	Albert Einstein College of Medicine	Associate Professor	Diabetes & Cancer Metabolism
133.	Susanne Warner, M.D.	2015	Texas A&M College of Medicine	Assistant Professor	Surgery
134.	John Williams, Ph.D.	2008	Columbia University	Professor	Molecular Medicine
135.	Terence Williams, Ph.D., M.D.	2021	Albert Einstein College of Medicine	Professor	Radiation Oncology
136.	Alex Wong, M.D.	2002	Harvard Medical School	Professor	Surgery

#	Name	Appointment Year	Professional Training	Title	Department
137.	F. Lennie Wong, Ph.D.	2006	University of Los Angeles	Associate Professor	Population Sciences, Computational & Quantitative Medicine
138.	Anna Wu, Ph.D.	2018	Yale University	Professor	Immunology & Theranostics
139.	Xiwei Wu, M.D., Ph.D.	2004	Loma Linda University	Professor [YL1]	Computational & Quantitative Medicine
140.	Yanzhong (Frankie) Yang, M.D., Ph.D.	2015	Shanxi Medical University/ Fudan University	Associate Professor	Cancer Genetics & Epigenetics
141.	Jiing-Kuan Yee, Ph.D.	1998	University of Texas, Austin	Professor	Translational Research & Cellular Therapeutics
142.	Lisa Yee, M.D.	2017	Yale University	Professor	Surgery
143.	Hua Yu, Ph.D.	2005	Columbia University	Professor	Immuno-Oncology
144.	Jianhua Yu, Ph.D.	2018	Purdue University	Professor	Hematology & Hematopoietic Cell Transplantation
145.	Yuan Yuan, M.D., Ph.D.	2017	UC Riverside	Professor	Medical Oncology
146.	John Zaia, M.D.	1980	Harvard University	Professor	Center for Gene Therapy
147.	Defu Zeng, M.D.	2002	Fujian Medical University	Professor	Immunology & Theranostics
148.	Bin (Amber) Zhang, Ph.D.	2020	Sun Yat-Sen University of Medical Sciences	Associate Professor	Hematologic Malignancies Translational Science

CURRENT MASTERS STUDENT LIST

Last Name	First Name	Mentor	Dept/Div
Ceballos	Hannah	1st year student	
Izuagie	Louis	1st year student	
Jiang	Nan	Tijana Talisman, Ph.D.	Molecular Medicine
Lee	Beomhyeok (Victor)	1st year student	
Mora	Mark	Mustafa Raoof, M.D.	Surgery
Perez	Eric	Terence Williams, M.D.	Radiation Oncology
Yao	Shunyu	1st year student	
Tao	Xiaoqun	1st year student	

MSTM ALUMNI

Last Name	First Name	Mentor	Dept/Div	Year of Graduation
Brase	Jordyn	Yuman Fong, M.D.	Surgery	2022
Bustillos	Christian	Michael Caligiuri, M.D.	Hematopoietic Cell Transplantation	2022
Dang	Jessica	Mingye Feng, Ph.D.	Immuno-Oncology	2021
Faustino	Vroniqa Ku'ulei	Javier Gordon Ogembo, Ph.D.	Immuno-Oncology	2021
Felix	Gerardo	Qiong (Annabel) Wang, Ph.D.	Molecular & Cellular Endocrinology	2021
Ghassemi	Bita	Christine Brown, Ph.D.	Hematology and Hematopoietic Cell Transplantation	2022
Hall	Jeremy	Marcin Kortylewski, Ph.D.	Immuno-Oncology	2022
Hui	Fion	Nadia Carlesso, M.D., Ph.D.	Hematologic Malignancies Translational Science	2022
Kiperman	Tali	Ke Ma, Ph.D.	Diabetes Complications & Metabolism	2022
Otazu	Kyle Griffith	Behnam Badie, M.D.	Surgery	2021
Seymour	Gubidxa	Jeffery Weitzel, M.D.	Medical Oncology & Therapeutics Research/Population Sciences	2020
Sharkas	Shawn	John Rossi, Ph.D.	Molecular & Cellular Biology	2021
Tizpa	Eemon	Ammar A. Chaudhry, M.D.	Radiology	2020
Valerio	Melissa	Guido Marcucci, M.D.	Hematologic Malignancies Translational Science	2021
Wang	Sadira	Mingye Feng, Ph.D.	Immuno-Oncology	2022
Zimmerman	Cloe	Javier Gordon Ogembo, Ph.D.	Immuno-Oncology	2021

CURRICULUM AND DEGREE REQUIREMENTS

Students in the MSTM program are required to complete a total of 60 units over the course of two years of study. City of Hope and KGI will grant a joint MSTM degree upon completion of all of the necessary requirements. Of the 60 total units, students must complete 12.0 units of core courses (C), 3.0 units of professional development courses (PD), 12.0 units of advanced technical (AT) and general elective courses, 3.0 units of Independent Research, and 30 units of the MSTM Thesis Research. The PDEV 5300 and MATH 5000 requirements could be waived for students who pass the initial assessment. Waived units must be replaced with advanced technical or general elective units.

A summary of the MSTM curriculum is as follows:

Course ID	Course Name	Location	Credits
Year One – Fall			
SCI 5000	Molecular Biotechnology (C)	KGI	1.5
SCI 5300	Pharmaceutical Discovery (C)	KGI	1.5
SCI 5310	Pharmaceutical Development (C)	KGI	1.5
SCI 6000	Advanced Biotech. (C)	KGI	1.5
SCI 6400	Fundamental Papers in Applied Medicine (C)	KGI	1.5
PDEV 5300	Business/Science Communications (PD)	KGI	1.5
MATH 5000	Applications of Statistics (C)	KGI	1.5
MATH 5020	Clinical Biostatistics (AT)	KGI	3.0
RES 6000	Independent Research	City of Hope	1.5
Year One – Spring			
SCI 5100	Molecular Basis of Disease (C)	KGI	1.5
SCI 6100	Pharmacogenomics and Precision Medicine (AT)	KGI	1.5
SCI 6110	Advanced Pharmacogenomics and Precision Medicine (AT)	KGI	1.5
SCI 6300	Advanced Pharmaceutical Discovery (AT)	KGI	1.5
SCI 6301	Advanced Pharmaceutical Discovery Lab (AT)	KGI	1.5
SCI 6410	Fundamental Papers in Applied Medicine (C)	KGI	1.5
RES 6000	Independent Research	City of Hope	1.5
Year One - Fall or Spring			
3.0 Credits of General (G) Electives to be taken either Fall and/or Spring			
Year One - Summer			
RES 6220	Master's Research Thesis	City of Hope	0.0
Year Two – Fall			
RES 6220	Master's Research Thesis	City of Hope	15.0

PDEV 5100	Professional Development (PD)	KGI	0.00
Year Two – Spring			
RES 6220	Master's Research Thesis	City of Hope	15.0
PDAV 5220	Bioindustry Ethics and Society (PD)	KGI	1.5

COURSE INFORMATION

SCI 5000 Molecular Biotechnology (KGI)
Students will be exposed to the conceptual foundations of biotechnology and the role played by discoveries and applications of molecular biology principles in advancing biotechnology horizons. This is a case-based course in which students will read landmark original papers and patents that shaped biotechnology and discuss these in the class. The case-based approach will follow the first few weeks of background material where a more standard lecture style will be used so as to bring students with different backgrounds on par with modern molecular biology.

SCI 5100 Molecular Basis of Disease (KGI)
This course examines the role of genes, proteins and RNA in causing or combating diseases, and emphasizes the current conceptual and analytical tools that are brought to bear, and their limitations, on our understanding.

SCI 5300 Pharmaceutical Discovery (KGI)
This course is designed to provide students with an understanding of how pharmaceutical and biotechnology companies discover new drugs. This course will focus on the discovery of small molecule drugs. The course will follow the process of pharmaceutical drug discovery from selection of targets to discovery of a product candidate, and the characterization of that drug necessary for initiation of clinical trials.

SCI 5310 Pharmaceutical Development (KGI)
The course will provide the terminology, timelines and practical examples for successfully understanding the challenges in progressing an idea for a drug from the earliest discovery stages through to product approval and launch. Case studies from industry will be presented detailing companies and products that utilize state-of-the-art discovery technologies and advanced drug delivery systems.

SCI 6000 Advanced Biotechnology (KGI)
During this course, the students will continue to be exposed to the foundations of biotechnology as well as the new technologies and therapies available in the field. The microbiome has been implicated as a major player in many health areas. An array of microbiome-based therapeutics is on the market or in development. The students will explore the role of the microbiome in human health and potential therapies. The course will also focus on personalized nutrition as a way to preserve or increase health using genetic, phenotypic, medical, nutritional, and other relevant information.

SCI 6100 Pharmacogenomics and Precision Medicine (KGI)
This course will focus on the opportunities presented by the growing contribution of human evolutionary and population genetics, and of human genomic information and technologies to

interdisciplinary approaches in the study of variable responses of humans to drugs and toxic agents, and how research may benefit the individual. The course will provide an in-depth analysis of salient examples where genetical thinking has impacted pharmacological sciences, including issues on genetic variability in biochemistry and physiology of drug action, drug uptake and metabolism; the opportunities for discovery and design of new therapeutic agents.

SCI 6110 Advanced Pharmacogenomics and Precision Medicine (KGI)
The majority of current treatment protocols for various medications are still in the "one-size-fits-all" model. However, with rapid advances in the field of pharmacogenomics filed, the implementation of pharmacogenomics tests into clinical practice has become a reality for some therapeutic areas. The goal of this course is to review the basics of pharmacogenomics and to learn how they can be combined with disease-specific applications.

SCI 6300 Advanced Pharmaceutical Discovery (KGI)
This course should provide students with a deeper knowledge of drug pharmacokinetics and pharmacodynamics, as well as with a deeper understanding of how pharmaceutical and biotechnology companies discover new drugs, and how larger companies manage their drug discovery portfolios.

SCI 6301 Advanced Pharmaceutical Discovery Lab (KGI)
The goal of this course is to solidify knowledge of drug pharmacokinetics and pharmacodynamics obtained in the Advanced Pharmaceutical Discovery course through a laboratory drug screen project. The drug screen project will involve a laboratory drug discovery screening against microbes, and description of obtained results in the form of group presentation and written report. This is a science/technical course that will freely intersperse business and regulatory issues into the workshops and assignments.

SCI 6400 Fundamental Papers in Applied Medicine (KGI)
This course delves into a few ground-breaking original research papers that have shaped the concepts and technologies of modern biomedical research, with a special focus on cancer. The goal is to understand the logic and principles of doing biological experiments: the importance of models and hypotheses, testable versus untestable hypotheses, controls, the limits of interpretation dictated by the results, how changing paradigms influence the progress of science.

SCI 6400 and SCI 6410 Fundamental Papers in Applied Medicine (KGI)
This course delves into a few ground-breaking original research papers that have shaped the concepts and technologies of modern biomedical research, with a special focus on cancer. The goal is to understand the logic and principles of doing biological experiments: the importance of models and hypotheses, testable versus untestable hypotheses, controls, the limits of interpretation dictated by the results, how changing paradigms influence the progress of science.

MATH 5000 Applications of Statistics (KGI)
This course offers an introduction to the terms, concepts and applications of statistical analysis, and re-enforces the necessary algebraic skills. Topics covered include data types, single variable regression, normal distributions, and significance tests. Students will apply concepts to practical examples in the life sciences using MS Excel software and gain proficiency in the visual interpretation and communication of data.

MATH 5020 Clinical Biostatistics (KGI)
This course provides a basic primer in statistical methods commonly used in the design of clinical trials. Topics covered are expected to include data reporting and descriptive statistics, probability, estimation, hypothesis testing (parametric, non-parametric, and categorical), multisample inference, regression and correlation. Sample size and power estimation methods will be developed for various hypothesis testing scenarios.

PDEV 5220 Bioindustry Ethics and Society (KGI)
This course explores the ethical challenges for commerce in healthcare systems and biosciences industry as it will be increasingly important for healthcare and bioscience leaders to consider the ethical ramifications of their work. The class will focus more on the practical application of ethical principles through real-world case studies, rather than emphasizing theories.

PDEV 5300 Business/Science Communication (KGI)
This course is designed around four broad themes: effective writing, oral communication, teamwork and leadership. Classes will be a blend of interactive lectures from faculty and industry executives, and workshops. Students will participate in faculty and peer reviews to help each other improve professional skills.

PDEV 5300 Business/Science Communication (KGI)
This course is designed around four broad themes: effective writing, oral communication, teamwork and leadership. Classes will be a blend of interactive lectures from faculty and industry executives, and workshops. Students will participate in faculty and peer reviews to help each other improve professional skills.

PDEV 5100 Professional Development (KGI)
In two four-hour intensive workshops and a selection of modules, students learn how to build their professional presence, gain insight into the process and timing of finding employment, learn skills that will improve their competitiveness, and develop expertise at showcasing their accomplishments.

RES 6000 Independent Research (City of Hope)
The goal of this course is to enable students to gain a comprehensive understanding of the recent biomedical research advances and Phase I clinical studies at City of Hope through roundtable discussions with the City of Hope faculty, laboratory experiences and City of Hope Phase I/Early

Therapeutic Disease Team meetings. Students will also have the opportunity to shadow clinicians through our clinical mentorship program to gain a better understanding for how to link research at bench side to bedside. Furthermore, students will also go through rigorous hands-on training on how to use various instruments and computational technologies within City of Hope Share Resource Facilities and apply these technologies to their thesis studies. By the end of the course, students are expected to identify thesis research topic and thesis mentor.

RES 6220 Master's Research Thesis (City of Hope)

The goal of this course is to enable students to conduct rigorous primary research leading to the completion of a master's thesis in a research laboratory at City of Hope. Students must complete ALS 493 Independent Research prior to this course. Please see section on MSTM Research Thesis for more information about the Master's Research Thesis.

MSTM ACADEMIC CALENDAR AT CITY OF HOPE

August 2022	
1	**Year 2 Students**: RES 6220 MSTM Research Thesis • MSTM Thesis Contract (see RES 6220 syllabus) **due** to City of Hope's Registrar via email and KGI Canvas
15-16	**Year 1 Students:** City of Hope's Student Orientation (A separate MSTM student Orientation is held at KGI. Please refer to KGI Academic Calendar for more information)
September 2022	
1st Sunday of the Semester	**Year 2 Students**: RES 6220 MSTM Research Thesis **due** to KGI Canvas • MSTM Thesis Contract • Thesis Milestones Checklist • Laboratory Safety Training certificates of completion • Training in Responsible Conduct of Research (RCR) certificate of completion
2	**Year 1 Students**: RES 6000 Independent Research (Fridays, 9:00 am to 5:00pm) begins
5	Labor Day
November 2022	
24-25	Thanksgiving Holiday
December 2022	
1	**Year 2 Students:** RES 6220 MSTM Research Thesis • Preliminary Thesis **due** to thesis committee and KGI Canvas
7	**Year 2 Students:** RES 6220 MSTM Research Thesis • Presentation of Preliminary Thesis to thesis committee **due** • Preliminary Thesis Evaluation Form and Rubric (see ALS 496 syllabus) **due** to City of Hope's Registrar and KGI Canvas
16	**Year 1 Students**: RES 6000 Independent Research (Fridays, 9:00 am to 5:00pm) ends
25	Christmas Holiday
January 2023	
1	New Year Holiday
6	**Year 1 Students**: RES 6000 Independent Research (Fridays, 9:00 am to 5:00 pm) begins
16	Martin Luther King Jr Day
February 2023	

1	**Year 2 Students:** PhD TM application **due** to PhD TM Admissions Committee • Cover Letter • MSTM transcript including grades from Fall semester of Year 2 • Supporting letter from the PhD TM mentor • PETITION for SELECTION of PhD TM MENTOR for DISSERTATION RESEARCH form (**APPENDIX A)**
5	**Year 2 Students:** Announcement of the PhD TM Admissions decisions
March 2023	
31	**Year 2 Students (PhD TM track):** RES 6220 MSTM Research Thesis • MSTM Thesis Seminar **due** at City of Hope **Year 2 Students (PhD TM track):** BIOSC 550 FSR begins
April 2023	
7	**Year 2 Students (all):** RES 6220 MSTM Research Thesis • MS/MSTM Research Symposium – Thesis Oral Defense at KGI
30	**Year 2 Students (non-PhD TM track):** RES 6220 MSTM Research Thesis • MSTM Thesis Seminar **due** at City of Hope
May 2023	
1	**Year 2 Students (all):** RES 6220 MSTM Research Thesis **due** to the Registrar at City of Hope and to the KGI Canvas • MSTM Thesis Cover Sheet • MSTM Final Thesis • MSTM Oral Defense Committee Report • Final Thesis Rubric (see RES 6220 syllabus)
12	**Year 1 Students**: RES 6000 Independent Research (Fridays, 9:00 am to 5:00 pm) ends
29	Memorial Day
30	**Year 1 Students**: RES 6220 MSTM Research Thesis • Formulate hypothesis and aims • Select thesis committee members
June 2023	
2	**Year 2 Students (PhD TM track):** BIOSC 550 FSR ends
5	**Year 2 Students (PhD TM track):** BIOSC 565 FSR Practicum begins
9	**Year 2 Students:** GRADUATION in the Rose Garden at 4:00 pm
30	**Year 2 Students (PhD TM track):** BIOSC 565 FSR Practicum ends
July 2023	
4	Independence Day

11	**Year 2 Students (PhD TM track):** PhD TM Trimester begins
15	**Year 1 Students**: RES 6220 MSTM Research Thesis • Hypothesis/Goal and Aims document due to the thesis committee for approval

MSTM RESEARCH THESIS

Please refer to RES 6220 MSTM Research Thesis Syllabus for additional details on milestones, deadlines and forms.

THESIS COMMITTEE

Toward the end of the first year, students are required to select the laboratory for their thesis research. The student and their research mentor (e.g. advisor) jointly choose the research topic and two faculty members, one of which has to be a COH faculty, as the voting members for their thesis committee. A second voting member can be a faculty from either COH or KGI. The committee members should be familiar with the research area that encompasses the student's thesis project. The thesis committee is chaired by a member other than the student's research mentor. The student's research mentor will participate as a non-voting member. They will serve primarily as an advisor to the thesis committee and to facilitate discussion. The MSTM co-Directors may review the committee membership, as necessary. The thesis committee membership may be reconstituted whenever the student's thesis topic is significantly modified. It is highly encouraged that the student meets with their committee members on a regular basis. Committee vacancies will be filled promptly.

The written thesis must be presented by the student for examination by the thesis committee. The thesis must be orally defended, and completion of the requirement will be finalized by approval of the document by thesis committee. Each member of the committee is expected to review the thesis and attend a public seminar in which the degree candidate presents the thesis research findings. Immediately thereafter, the thesis committee will meet privately with the student to review any aspect of the thesis including the research methodology, findings, and conclusions.

THESIS DOCUMENT FORMAT

The dissertation must be written in English, at a professional level of expression and presentation. In addition, thesis document should follow the following format:

- Double-spaced, Arial Font type 11, 0.6 in margins
- Each Figure should be placed on an individual page at the point that it is referenced in the thesis (*i.e.* figures cannot be all at the end).
- Figure legends can be on this page and/or a separate page.

THESIS FINAL DRAFT

A final thesis draft must be submitted to the MSTM thesis committee for a critical review **two weeks prior to** the Thesis Oral Defense. The thesis must include the following elements:

1. Cover pages
    - Cover page with name, date, thesis mentor, thesis title
    - Table of Contents that list the sections and page numbers
    - List of Figures with title and page numbers

2. Hypothesis/Goal and Aims (2 pages)
    - Describe the Hypothesis/Goal tested by the research project
    - Provide the rationale for the Hypothesis/Goal (foundation from the current literature)
    - Describe how the Hypothesis/Goal will be tested in one or two aims

3. Background and Significance (6-8 pages)
    - Comprehensive introduction to the biological question addressed by the project
    - Describe the significance of the question to the field of study and human health

4. Results (no page number suggestion, but should be comprehensive)
    - Describe the findings of the research project
    - Encouraged, but not required, to include details of experiments that did not technically succeed, and what was learned from the experiment

5. Discussion (5-7 pages)
    - Describe the importance of the findings in the context of the literature
    - Describe future directions of the research

6. Methods (no page number suggestion, but should be comprehensive)
    - Describe the methodology, including protocols, reagents, and statistical analysis

7. Bibliography (List all references, using the Cell output style)

LABORATORY NOTEBOOK

A lab notebook is a complete record of procedures followed and the observations a scientist makes while conducting research. It should contain any necessary background, references, information on how the experiments were performed and the experimental results. The lab notebook is a legal document should the conducted research contribute to the issuing of a patent and the lab's scientific legacy.

- The entries in the lab notebook must be in English, detailed, clear and legible
- Identified with an entry or experiment's date
- Each entry should contain a summary of a finding and possibly a plan of future experiments
- The lab notebook can be either hard copy, or an electronic notebook

GRADING SYSTEM

Students will receive letter grades for their course work. Students must receive a grade of 70 percent or above (C- or better) in all course work to continue in the program. Non-graded courses receive a Pass or Fail.

Letter Grade	Percentage	
A+	97% - 100%	Pass
A	93% - 96%	Pass
A-	90% - 92%	Pass
B+	87% - 89%	Pass
B	83% - 86%	Pass
B-	80% - 82%	Pass
C+	77% - 79%	Pass
C	73% - 76%	Pass
C-	70% - 72%	Pass
D+	67% - 69%	Fail
D	63%-66%	Fail
D-	60% - 62%	Fail
F	0% - 59%	Fail

GRADE CHANGE POLICY

Evaluating student work and maintaining academic standards are the responsibility of the faculty, and faculty decisions about grades will only be overruled in cases where there is clear evidence of arbitrary and/or inconsistent grading. If a student wishes to challenge a grade for RES 6000 or RES 6220, the student should discuss the grade with the course coordinator. If the matter cannot be resolved at this level, the student should make a request to the Dean to appoint a three person Grade Change Committee, which will include the course coordinator, and two faculty actively involved in teaching and/or curriculum, but excluding the Dean, Vice Dean or Directors. The Dean will also appoint one member as the Chair (not the course coordinator), who will work to find consensus, but the final decision will be made by committee majority vote. This committee will consider the grading issue separate from any potential consequences of the grade for the student's academic standing, which is covered under a separate policy (see Academic Standards section).

Application and Admissions to PhD in Translational Medicine (PhD TM)

The strategic goals of the City of Hope support education as one of the major efforts of the institution. Areas of translational and precision medicine are critical for development of treatment strategies, drug development, and disease prevention. The PhD in Translational Medicine program permits students graduated from Master of Science in Translational Medicine who have discovered that they are interested in furthering their career in research and developing research at the level of a PhD to continue at the Irell & Manella Graduate School of Biological Sciences.

To be eligible for engagement in the PhD in Translational Medicine, students must have demonstrated the foundational experience for success in study at the PhD level. Validation of requisite skills and ability are satisfied with:

- Successful completion of the MSTM program by the start date of enrollment to the IMGS as a PhD student;
- A cumulative GPA of 3.4 from the MSTM program; and
- Support from the MSTM thesis mentor and/or future PhD thesis mentor by the beginning spring semester of the MSTM program.

Application and Admissions Process

A complete application package, which consists of the following documents, should be submitted to the Dean, Vice Dean and Director of PhD Administration, by February 1:

- Cover letter from the student to indicate the student's interest and commitment to the PhD TM program
- Unofficial MSTM transcript that includes grades from Year 1 and Fall Semester of Year 2.
- Signed PETITION for SELECTION of PhD TM MENTOR for DISSERTATION RESEARCH form (Graduate School Intranet - Find in Graduate Student Documents).
- A letter of support to confirm mentor's commitment to continue training the student at PhD level and to support the student's PhD stipend starting July 1 of Year 1 on the PhD TM program. The letter should be sent directly from the mentor to the Dean, Vice Dean and Director of PhD Administration.

Admissions decisions will be communicated to the applicants and their proposed PhD TM mentors by February 5.

POLICIES AND PROCEDURES

ATTENDANCE

Students are required to be in attendance full time for both instructional and research activities. The student commitment is full time, subject to any rights to time off under applicable law and with reasonable consideration for holidays, illness, and leaves of absence as described below. Students are expected to make steady progress on their dissertation topic because the outcome of their research impacts their mentors, colleagues in the lab, and the entire institute. Students are expected to advise the Graduate School Office before beginning any employment, so that City of Hope and the student may determine that the employment does not pose a conflict of interest. Additionally, any student holding employment will be expected to meet all expectations of the MSTM Program.

Leaves of absence

The student's advisor and the Graduate School Office must be informed when a student is not available to conduct their laboratory research or attend classes at City of Hope. At City of Hope, students are provided ten sick days per year. If a student has a serious illness, personal emergency, pregnancy, military deployment or other event that requires more than ten days, they may request a leave of absence from their mentor and the Graduate School Office by submitting the Absence Request Form (Graduate School Intranet - Find in Graduate Student Documents). Students should be aware that more than six months on leave will cause many student loans to go into repayment. Before requesting a leave, students who receive financial aid should meet with a financial aid counselor at KGI for more information on how their loans may be affected by a leave of absence. International students should meet with the International Student Advisor at KGI for more information on how the leave will affect their ability to stay in the United States. A leave of absence may be approved only if the request is consistent with the policies at both City of Hope and KGI. Tuition for a semester may be waived only if a student is on leave (1) for military deployment and (2) for a significant part of the semester.

Holidays

The Irell & Manella Graduate School of Biological Sciences observes the same seven holidays observed by City of Hope [New Year's Day, Martin Luther King Jr. Day, Memorial Day, July 4th, Labor Day, Thanksgiving, and Christmas]. For standard holidays, an Absence Request Form is not required. Additionally, the Graduate School encourages students to take additional days off (e.g. 10 per year) as part of maintaining balance. Sixteen days (including observed holidays) is the amount of time the Graduate School believes is reasonable for students to be absent for non-illness related reasons and still be able to meet the program commitments. However, given the program commitments, students must receive approval from their mentor before taking time off. To obtain approval, students should:

1. Consult with their mentor.

2. Complete an Absence Request Form and submit the form to the student's mentor, the Graduate School Registrar and the mentor's Business Manager.

Students should contact the Registrar with any questions about attendance or requests for time off. Form is located at (Graduate School Intranet - Find in Graduate Student Documents).

International Students: Attendance and Traveling

When traveling internationally ensure your I-20 document has been signed by a designated school official at KGI. To maintain their immigration status, international students on F-1 visa must maintain full course of study at all times. International students seeking to take leave or drop below full course of study must first obtain approval from the school's Designated School Officials (DSOs) at KGI. Requests may be approved for the following reasons (8 CFR 214.2(f)(6)(i) and (iii)):

1. Initial academic difficulties;
2. A temporary illness or medical condition (with medical documentation from a licensed medical doctor, doctor of osteopathy, or licensed clinical psychologist but not to exceed an aggregate of 12 months); or
3. Need fewer courses than a full course load in their last term to complete the program of study.

MANDATORY COMPLIANCE TRAINING

All students must comply with yearly mandatory compliance, harassment training and submit annual health paperwork (in the month of birth). If students fail to complete these requirements by the due date, they will be suspended from the graduate school until all requirements are completed.

TRANSCRIPT REQUEST FEE

Official academic transcripts can be ordered from through KGI's Registrar Office.

REPLACEMENT DIPLOMAS FEE

Replacement Diplomas can request if the original has been lost or destroyed, or to request a re-issue after a graduate's legal name change. Documentation of your legal name change is required. Examples of documentation are court order, a new passport, driver's license, marriage certificate or other government issued identification. A fee of $50 will be charged per request payable by personal check. Checks should be made payable to "Keck Graduate Institute". Please mail form and check to The Office of the Registrar, 535 Watson Dr., Claremont, CA 91711. Please allow about 6–8 weeks for processing.

LAPTOPS

The Irell & Manella Graduate School of Biological Sciences provides each MSTM student with a laptop during orientation. It is each student's responsibility to maintain the laptop in good working order and utilize it appropriately (see the Graduate Student Laptop Policy – (Graduate School Intranet - Find in Graduate Student Documents). Should the laptop be damaged, it is the student's responsibility to contact the City of Hope IT department to arrange for repairs at the student's expense. The student shall return the laptop and all peripheral equipment to the registrar within 15 days of when the student completes/exits the program. If laptops are not returned the school will be unable to provide transcripts upon request or degree diplomas. Also, students run the risk of being personally responsible for full repair or replacement cost of the computer.

WELLNESS

The Graduate School Administration (Dean, Vice Dean, Directors, Co-Directors, Associate Directors, Assistant Directors and Office Staff) are here to assist if a graduate student needs help. There are resources that may not be listed. If the student reaches out we can connect them accordingly. Please feel free to email or come into the Graduate School if additional assistance is needed.

- Rideshare Program: Benefits include free shuttle from Baldwin Park station, reserved carpool spaces, bike lockers, bike racks, and a public transportation subsidy for a Metrolink/Metro Pass depending monetary amount depends on the type of pass. You can view these at cityofhope.commuterportal.com with the access code: climate.

- Lyra Health Program – Students are eligible to participate in this program which helps with a variety of personal life matters including stress management, legal/financial services, childcare/elder care referrals, parenting skills, grieving, managing relationships or balancing work and life. There is online help as well as access to Dr. Martinez, our onsite counselor. Register for these services at coh.lyrahealth.com. For additional assistance you can use the toll-free number 877-672-1266.

- Wellness Program: Students can earn points towards $350.00 in gift cards for daily activities such as tracking healthy habits, reading about healthy habits, walking, and for getting an annual biometric screening or flu shot. Plus, you will receive an additional $25.00 credit toward purchasing a step-tracking device. You can join this program by visiting join.VirginPulse.com/CityofHope then download the Virgin Pulse app.

ACADEMIC STANDARDS

The Faculty and Staff of the Irell & Manella Graduate School of Biological Sciences value high academic standards and believe that they are critical to ensure the overall quality of the Graduate School. The program Co-Directors, in consultation with the Dean and Vice Dean of the Irell & Manella Graduate School of Biological Sciences at City of Hope and the Dean of the Henry E. Riggs

School of Applied Life Sciences at KGI, shall oversee the academic standards of the MSTM program including verification of fulfillment of academic and graduation requirements.

ACADEMIC STANDING

Students are expected to make satisfactory academic and professional progress throughout their academic program.

Satisfactory Academic Progress

All enrolled students are required to demonstrate good academic standing and satisfactory progress toward their degree. Students with particular questions concerning satisfactory progress should contact the registrars or program co-Directors. The following policy statements describe the general parameters for satisfactory academic progress at the Irell & Manella Graduate School of Biological Sciences at City of Hope.

Satisfactory Academic Progress and good academic standing are generally defined as:

- Meeting the professional and academic expectations as defined in the degree requirements section in the Student/Faculty Handbook
- Behaving consistently with professional and ethical standards as outlined in the Ethical Principles and Practices in the Student/Faculty Handbook
- Completing academic and educational projects, reports, and programs by deadlines

Unsatisfactory Progress

The following are grounds for determining that satisfactory progress in the academic program is not being made:

- Failure to maintain a minimum of C- in every course
- Failure to adhere to all Dissertation guidelines, meetings, and deadlines as defined in the Student/Faculty Handbook
- Receipt of a “Fail” grade in a course or required activity
- Violation of professional or ethical conduct policies
- Little or no progress on the dissertation, as determined by dissertation mentor and/or committee meetings
- Failure to comply with school and/or City of Hope rules and procedures
- Evidence of personal factors (interpersonal or intrapersonal) that may hinder the student’s professional and academic competence
- Violation of Student/Faculty Handbook policies and procedures
- Violation of City of Hope policies and procedures

FAILURE TO MEET ACADEMIC STANDARDS

At the close of each semester the academic status of every student will be audited. All students who have met standards for academic progress will be deemed to be in "Good Standing". Any student who has failed to meet the standards described above will have their file reviewed by the program Co-Directors.

The following sanctions will apply to any student not in Good Standing:

- A registration hold may be placed on the student record which will prohibit registration for courses. This also includes auditing a course.
- The student may not apply for travel funding, institutional fellowships, or other Graduate School funding.
- The student may not submit to or collect business requests from the registrar's office. This may include certifications, loan deferrals, proof of student status, academic audits, diploma requests, official or unofficial transcripts, and grade requests.

EXCEPTIONS TO ACADEMIC REGULATIONS

A request for an exception to a published Graduate School academic policy or a request for any special academic privilege must be made in writing to the IMGS registrar and COH Co-Director.. All documentary evidence in support of each application for academic exception or academic privilege should be submitted with the written request. Each case will be decided on its own merits. All exceptions, waivers and special privileges are subject to review by a Dean and/or the program Co-Directors for a final decision. Students are encouraged to maintain their own personal copies of all paperwork submitted.

SANCTIONS

When a MSTM student does not meet the standards for adequate academic progress, the following procedures will be used to determine whether the student is failing to make satisfactory progress and/or whether an ethical or behavioral problem exists.

The program Co-Directors will review all student cases of students who are not in Good Standing and for cases which result in a finding of insufficient academic performance or progress, professional practice field training unsuitability, or unethical or inappropriate behavior the following actions may be recommended to the Deans of the Irell & Manella Graduate School of Biological Sciences at City of Hope and the Henry E. Riggs School of Applied Life Sciences at KGI.

Warning

Warning Status, with or without a remediation plan, can be recommended when a student's academic work or professional development falls below the Graduate School's standards but the nature of the difficulty or infraction does not require more serious or more immediate action.

Probation

Probationary status is recommended when a student's academic progress or professional development has been inconsistent with the Graduate School's requirements. A student is given a specific amount of time (usually one term) in which to remediate the cause(s) of probation or will otherwise face dismissal from the program.

Mandatory Leave of Absence

A student is recommended for Mandatory Leave of Absence in those cases in which the academic work or professional development, in the opinion of the Deans of the Irell & Manella Graduate School of Biological Sciences at City of Hope and the Henry E. Riggs School of Applied Life Sciences at KGI, and taking into consideration the program co-Directors' recommendations, requires serious remediation that necessitates withdrawal from the Graduate School in order to complete the required remediation.

Termination

A student may be terminated from the academic program when conditions are judged to be of a serious nature and are not judged to be remediable, insufficient grade point average and/or multiple Fail grades occurs, when a serious violation of the Graduate School's standards of conducts and ethics occurs or when a student has failed to remediate previously identified deficiencies within the specified time.

DISMISSAL AND SUSPENSION POLICIES

Students may be suspended or dismissed as a result of unsatisfactory performance as judged by their advisor or dissertation committee.

The grounds for dismissal are:

- Twice failing a required course;
- Unsatisfactory performance as judged by the thesis committee;
- Unethical performance - scientific misconduct, plagiarism, cheating;
- Unexcused failure to meet graduate school requirements;
- Prolonged, unexcused absence;
- Violation of applicable laws and policies, including but not limited to those set forth herein, or other inappropriate misconduct, as may be determined by the Dean of the Graduate School;
- Unauthorized leaves of absence or failure to return from an approved leave.

One of the consequences of unsatisfactory academic performance is that it inevitably slows a student's progress toward the Master's degree. Another consequence of unsatisfactory academic performance is that a student is not eligible for travel grants and merit fellowships.

ETHICAL PRINCIPLES AND PRACTICES

Any academic violation, such as fabrication, plagiarism, and cheating, shall be dealt with firmly. When a violation by any MSTM student is reported on the City of Hope campus, the Dean of the Irell & Manella Graduate School of Biological Sciences will appoint three faculty to form an *ad hoc* investigation committee. The program Co-Directors from both City of Hope and KGI will be notified and will participate in the committee as *ex officios*. The findings of the investigation committee will be transmitted to the Dean, and the Dean, in consultation with the program Co-Directors, shall determine what, if any, disciplinary action shall be taken. Appeals should be addressed to the Dean of the Irell & Manella Graduate School of Biological Sciences. If the violation is committed on the KGI campus, the program Co-Director from City of Hope will be notified by KGI and will participate in the investigation according to KGI's Honor Code Procedures.

USE OF ALCOHOL / ILLEGAL SUBSTANCES

Use of alcohol or drugs that violates applicable laws is strictly prohibited. In addition, students must comply with rules regarding campus activities involving the legal use of such substances.

The illegal or abusive use of alcohol and/or other drugs by students impacts educational outcomes. Students needing assistance in addressing issues involving drug or alcohol use are encouraged to seek help through the Horizon Health assistance plan offered to students, which may be accessed by calling (888) 293-6948 / TTD (866) 846-5949. This service is available 24 hours a day, 365 days a year.

Alcohol

Expectations regarding alcohol use includes for on and off campus events, but are not limited to, the following:

1. The purchase, possession, or consumption of any alcoholic beverages (including beer and wine) by any person under the age of 21 is prohibited.
2. Alcoholic beverages will not be provided to individuals under 21 years of age.
3. The selling, either directly or indirectly, of alcoholic beverages (including beer and wine) except under the authority of a California Alcoholic Beverage Control Board license is prohibited. This includes selling cups, mixes, ice, tickets for admission, required donations, etc.
4. The serving of alcohol to an intoxicated person or to the point of intoxication is prohibited.
5. The act(s) of being drunk and disorderly in public view, including on campus and public sidewalks and walkways surrounding the campus, is prohibited.
6. Behavior that is disruptive or abusive to others as a result of using intoxicants is strictly prohibited.

Individuals planning to serve alcohol at any on-campus function must get prior approval. Contact the Academic Programs Specialist for additional information. Approval must be obtained for all events on campus.

Drug Policy

The Graduate School expects all students and student groups to comply with all local, state and federal laws regarding the use, possession, sale or consumption of illegal drugs. It is the responsibility of each individual to be aware of, and abide by, all federal, state and local ordinances and graduate school regulations regarding the same. Current laws provide for severe penalties for violations which may result in criminal records.

Tobacco Policy

The use of all tobacco products, including E-Cigarettes, is prohibited inside and on all City of Hope premises, including in student housing and vehicles parked on City of Hope premises.

GRIEVANCE PROCEDURE

A grievance is any alleged unauthorized or unjustified act or decision by a member of the faculty, staff, and/or management employee that adversely impacts the status, rights, or privileges of a student. This process should be used to settle grievances that are not considered in the Handbook with respect to specific policies or investigations. Members of the grievance committee and the participants in the process must respect confidentially for students and faculty and conform to FERPA regulations.

If an alleged unauthorized or unjustified act or decision is made by a member of the faculty, staff, and/or management employee at City of Hope, student appeals and grievances should be addressed to the Dean of the Irell & Manella Graduate School of Biological Sciences within thirty days of the date of the action notice. Students will be entitled to a hearing, if an appropriate, timely request is made, as determined by the Dean. The request for a hearing should include the student's reasons for requesting the meeting and name parties, if any, who the student believes are pertinent to the grievance.

Within thirty days, the Dean will constitute an *ad hoc* grievance committee, which consists of three faculty members. The grievance committee shall interview parties as they see fit, including those suggested by the student, and gather all materials from the Graduate School that allow them to make a fair and unbiased decision which they should submit to the Dean within thirty days after constitution of the committee.

The Dean shall inform the student of the committee's decision within fifteen days of receipt of the decision and indicate if the Dean supports the committee's decision. If the Dean does not support the committee's decision, the Dean shall indicate the reason in writing.

TITLE IX EQUAL EDUCATION OPPORTUNITIES

The Graduate School wants its students to be fully informed about Title IX of the Education Amendments of 1972, 20 U.S.C. § 1681 et seq. (1988), which prohibits sex discrimination in federally assisted education programs.

This law states in part:

No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance.

The Title IX coordinator for City of Hope's Irell & Manella Graduate School of Biological Sciences is Joline Treanor, Chief Human Resource Officer, email: jtreanor@coh.org. The purpose of the Title IX coordinator is to coordinate the Graduate School's efforts to comply with and carry out its responsibilities under Title IX. The graduate school has adopted grievance procedures to govern the resolution of complaints alleging any action prohibited by Title IX. These procedures are attached **Appendix A**: Federal Compliance to the student handbook disseminated annually to students and are also available from the Title IX coordinator.

Harassment / Discrimination

The Graduate School is committed to providing an environment that is free from discrimination and harassment. No one may be discriminated against because of national or ethnic origin, sex, sexual orientation, marital status, race, color, religious creed (including religious dress and religious grooming), national origin, citizenship, ancestry, age, physical disability, mental disability, medical condition, genetic information, legally protected family care or medical leave status, marital status, sexual orientation, domestic partner status, military status, veteran status, military caregiver status, gender, gender identity, gender expression, sex (including pregnancy, perceived pregnancy, childbirth, breastfeeding, or related medical conditions), or any other basis protected by local, state or federal laws. Harassment in any form is prohibited, including verbal, physical and visual sexual harassment. Any student who believes they have been harassed by a fellow student, staff member, mentor, or representative of the institution should promptly report the incident to Title IX Coordinator, Joline Treanor, Chief Human Resource Officer, email: jtreanor@coh.org. The Graduate School follows the same policy set forth in the Enterprise EEO Policy.

Reasonable Accommodation

The Graduate School complies with the Rehabilitation Act (Section 504) and the Americans with Disabilities Act (ADA), and has adopted a policy that assures continued reasonable accommodation will be provided for students with disabilities, so they can participate fully in the educational program and activities.

The general definition of a student with a disability is any person who has "a physical or mental impairment which substantially limits one or more of such person's major life activities," and any person who has "a history of, or is regarded as having, such an impairment." The Graduate School

is not required by law to change the "fundamental nature or essential curricular components of its programs in order to accommodate the needs of disabled students," but it must provide reasonable academic accommodation.

Students with learning disabilities as well as physical disabilities may register for accommodations with Mark Briskie, Senior Disability Administrator, 4920 Rivergrade (extension 85367). The Graduate School follows the same policy set forth in the Enterprise EEO Policy.

FERPA-FAMILY EDUCATIONAL RIGHTS AND PRIVACY ACT

The Family Educational Rights and Privacy Act of 1974, commonly referred to as FERPA, is designed to protect the privacy of student education records. It affords eligible students certain rights with respect to their education records and describes circumstances under which the institution may disclose education records. These rights include:

- The right to inspect and review their educational records
- The right to request an amendment of their education records
- The right to consent to the disclosure of their education records
- The right to file a complaint with the US Department of Education

ANTI-BULLYING ENVIRONMENT

The Graduate School will not in any instance tolerate abusive, disrespectful, or bullying behavior (referred to in this policy as "bullying behavior") by or towards any person, including but not limited to, students, staff, leadership, chairs, faculty and visitors. Any bullying behavior, regardless of intent, is unacceptable. The Graduate School defines bullying as severe and/or repeated mistreatment of one or more people by one or more perpetrators. Bullying generally includes abusive conduct such as:

- Threatening, humiliating or intimidating behaviors.
- Work interference/sabotage that prevents work from getting done (or attempts to prevent work from getting done).
- Verbal abuse.

Bullying conduct does not need to be based upon any aspect of an individual's identity that is protected by law in order to constitute a violation of this policy.

Although it is not possible to identify every type of conduct that may violate this policy, the Graduate School considers the following types of behavior to be examples of bullying:

- Verbal bullying: Slandering, ridiculing or maligning a person or their appearance, lifestyle, family, or culture; persistent name-calling that is hurtful, insulting or

humiliating; using a person as the butt of jokes or pranks; abusive and offensive remarks; or spreading rumors.
- Physical bullying: Pushing, shoving, kicking, poking, tripping, assault or threat of physical assault; or damage to a person's work area or property.
- Gesture bullying: Nonverbal gestures that can convey threatening messages.
- Exclusion: Socially or physically excluding or disregarding a person in work-related activities.
- Sabotage: Subverting, obstructing, or disrupting another person's work performance.

Cyberbullying refers to bullying, as defined above, that occurs using a computer, cell phone, smartphone, tablet, pager, or other device that transmits electronic information, regardless of whether the device is owned by or connected to City of Hope's network. Cyberbullying is also prohibited.

There is a difference between bullying and appropriate supervision. Examples of reasonable supervisory actions, when carried out in an appropriate manner, include:

- Providing performance appraisals, where applicable;
- Coaching or providing constructive feedback;
- Monitoring or restricting access to sensitive information for legitimate business reasons;
- Scheduling ongoing meetings to address performance issues;
- Setting aggressive performance goals to help meet departmental goals; and
- Counseling or disciplining for misconduct.

This policy in no way prohibits students from engaging in any activities that are protected under applicable state and federal laws, including but not limited to any activity that is protected under Section 7 of the National Labor Relations Act, which includes the right of employees to speak, raise concerns and/or debate about their wages, hours and working conditions.

All personnel are strongly encouraged to report any bullying conduct they experience or witness as soon as possible to an Associate Director/Director, the Dean, or the Vice Provost; or to Human Resources so that the concerns can be addressed. Individuals may also report any issues and concerns on a completely confidential basis by completing a TIPS form or by contacting Corporate Compliance.

Anyone in a management or leadership capacity who becomes aware of or receives a complaint of bullying, through any channel, must immediately inform Human Resources. The Graduate School will conduct a fair and timely investigation whenever it receives an allegation of bullying. Complaints and investigations will be kept confidential to the extent possible.

If the Graduate School concludes that a violation of this policy has occurred, prompt and effective remedial action will be taken. The Graduate School may also report to law enforcement, if appropriate. Retaliation is strictly prohibited, and no action will be taken against any person for reporting possible violations of this policy in good faith.

PREGNANCY AND/OR PARENTAL LEAVES OF ABSENCE

City of Hope neither requires nor prohibits a Pregnancy or Parental Leave of Absence. Non-birth parents may request a Parental Leave of Absence. Non-birth parents may include:

- Spouses/partners anticipating or recently experiencing the birth of a child;
- Adoptive parents; or
- Parents through surrogacy.

Pregnancy anti-discrimination policy

City of Hope prohibits discrimination on the basis of any protected characteristic, including discrimination on the basis of pregnancy, in the administration of its graduate programs. To that end, City of Hope will neither require nor prohibit leaves of absence for pregnancy or childbirth. In addition, City of Hope will reasonably accommodate its graduate students, including pregnant graduate students, so that they may continue to make progress toward the completion of their graduate degree.

Any student who believes that they have not been treated equitably under the provisions of this policy should promptly report the incident to Kety Duran, Chief Human Resource Officer, located in Human Resources, Needleman 2nd Floor, Room 204A; email: kdurin@coh.org (extension 80545).

Childbirth Accommodation

City of Hope offers expecting and new parents with a Childbirth Accommodation during the period of time around the birth of a child that allows the graduate student to enroll full-time and maintain active student status throughout the period so that graduate student rights and privileges are not impacted. Under a Childbirth Accommodation, a parent (either birth or nonbirth) is eligible for a twelve (12) week accommodation period during which the parent can work with their mentor and department to reschedule assignments, examinations, and other academic requirements. The Childbirth Accommodation period is not a Leave of Absence from City of Hope. Rather, graduate students on a Childbirth Accommodation are expected to remain actively engaged in classwork and research, and if applicable, clinical activities, even if at a reduced level.

Support for Expecting and New Parents

City of Hope understands that welcoming a new child to one's family can be an exciting and demanding time in one's life and provides several options to support its graduate students throughout this period. Students who are in late stages of pregnancy, childbirth, taking care of a newborn, or adopting a child should reach out to their mentor to discuss whether an

accommodation or leave of absence may be a better option. Except as specified below, all provisions of the Leaves of Absence policy defined above will apply in the case of Pregnancy and Parental Leaves of Absences.

RESPECTFUL TREATMENT OF OTHERS

The Graduate School is a multicultural community of people from diverse racial, ethnic and class backgrounds, national origins, religious and political beliefs, physical abilities, and sexual orientations. Our interactions are enriched by our acceptance of one another, and we strive to learn from each other in an atmosphere of positive engagement and mutual respect. Students are expected to take responsibility for awareness of racism, sexism, ageism, xenophobia, homophobia, and other forms of oppression.

Discrimination will not be tolerated in our community. This includes, but is not limited to, verbal or written abuse, threats, harassment, intimidation, or violence against person or property. In this context, we do not accept alcohol or substance abuse as an excuse, reason, or rationale for such abuse, harassment, intimidation, or violence. Such inappropriate behavior will subject a student to discipline.

GRADUATE STUDENT TRAVEL GRANT

MSTM students may apply to graduate student travel grant for attending national and international scientific meetings. Students planning to attend meetings are expected to apply to the meeting organizers for student assistance funds. In addition, as funding permits, the School will grant up to $2000 of support to graduate students who wish to present their work at scientific meetings to offset the costs of registration, travel, lodging, and food. Students will be reimbursed for expenses after submitting their receipts to their departmental business manager. To qualify, students must be in good academic standing and presenting their research at the conference.

Students must apply before the meeting. Applications should be submitted to the Registrar by these Deadlines:

- January 1st, for conferences that will be held in March, April, May, June and July
- May 1st, for conferences that will be held in July, August, September, October and November
- September 1st, for conferences that will be held in November, December, January, February and March

The application must follow the Graduate Student Travel Grant Program Overview Graduate School Intranet - Find in Graduate Student Documents.

MSTM TUITION, FEES AND FINANCIAL AID

MSTM tuition is billed and payable through KGI Financial Aid Office. All students are required to pay tuition and fees at the current year's rate. IMGS and KGI reserve the right to change tuition and fees at any time. Please refer the student accounts at KGI website: https://www.kgi.edu/student-life/student-accounts/

The current tuition and fees are:

- Full Year Tuition - $ 41,800
- Application Fee - $ 75
- Enrollment Fee - $ 400
- Late Payment Fee** – The greater of 1% of the past due Student Account Balance or $ 50
- Late Registration Fee - $50

** Late Payment Fees are accrued on a weekly basis beginning with the first business day following the payment deadline

For information on MSTM fellowships, student loans and bill and payments:

Fellowships:
KGI Admission Office
Email: Admissions@kgi.edu

Student Loans:
Financial Aid Office
Email: Financial_Aid@kgi.edu

Bill and Payments:
Student Account Office
Email: Student_Accounts@kgi.edu

APPENDIX A: FEDERAL COMPLIANCE

TITLE IX COMPLAINT PROCEDURES

I. Introduction

Irell & Manella Graduate School of Biological Sciences at City of Hope (the "School") has developed the following procedures to provide prompt and equitable resolution of complaints alleging any action prohibited by Title IX of the Education Amendments Act of 1972 ("Title IX"). Title IX prohibits sex discrimination in federally assisted education programs. This law states in part:

No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance…

Use of these procedures does not affect other rights and remedies that may be available to a complainant under federal and state statutes prohibiting discrimination. These procedures are available to anyone who, at the time of an alleged violation, is enrolled at or employed by the School.

II. Definitions

Complainant: person filing the complaint of discrimination (including harassment) on the basis of sex.

Respondent: person alleged to have discriminated (including harassment) on the basis of sex.

Title IX Coordinator: means the employee designated to coordinate the School's efforts to comply with and carry out its responsibilities under Title IX and the Title IX implementing regulations.

III. Procedures

A. Any person enrolled at or employed by the School and claiming to have been discriminated against by the School in its education programs or activities on the basis of sex may use these procedures. All complaints of sex discrimination will be promptly investigated by the Title IX Coordinator or their designee.

1. Complaints should be addressed to: Title IX Coordinator, Joline Treanor, Chief Human Resource Officer, email: jtreanor@coh.org.

   Joline Treanor, Title IX Coordinator
   City of Hope Human Resources
   1500 E. Duarte Road, Duarte, CA 91010
   jtreanor@coh.org

2. Complaints against the Title IX Coordinator will be processed in accordance with these procedures except that all responsibilities of the Title IX Coordinator will be fulfilled by the Corporate Compliance Officer of City of Hope or their designee. Under these circumstances, complaints should be addressed to:

   Chief Compliance Officer
   CorporateCompliance@coh.org (ext.88084)

B. Informal Resolution

1. Any person subject to this policy may seek advice or information on matters relating to discrimination or harassment without having to lodge a formal complaint. However, a person subject to this policy is not required to pursue informal resolution before making a formal complaint.

2. The Title IX Coordinator or the Corporate Compliance Officer, if the matter relates to the Title IX Coordinator, may be able to mediate the conflict by discussing the allegation informally with relevant parties in an attempt to end the alleged discrimination or harassment and resolve the issue. If there is a resolution acceptable to both parties, the matter will not proceed further.

3. Records will be kept of materials generated by such informal mediation along with an informal written agreement that will be reviewed and signed by both parties and maintained by the Title IX Coordinator.

C. Formal Complaint Procedures

1. In order for a complaint to be formally investigated, the complaint must be filed in writing. The complaint must be filed within one hundred eighty (180) days after the complainant became aware of the alleged violation. Complaints must contain the following information:

   - Name, address and telephone number of the complainant
   - A brief description of the alleged violation, including the location and date of the incident(s) and the names of all participants and known observers of the offensive conduct
   - The relief the complainant seeks
   - The complainant's signature

2. Within ten (10) days of receipt of the complaint, the Title IX Coordinator will determine whether the complaint merits formal review. A formal complaint may be dismissed at this stage if the complaint is deemed

groundless for such reasons as the following: the complaint is not filed in a timely fashion; or the alleged behavior does not constitute a violation of Title IX. The Title IX Coordinator will seek the advice of the Office of General Counsel as needed.

3. If the Title IX Coordinator determines that the complaint merits formal review, the Title IX Coordinator will advise the Dean about the complaint and will, in consultation with the Office of General Counsel, initiate a formal investigation of the complaint. An individual, a committee or an outside party may conduct the investigation. The purpose of the investigation is to determine the facts relating to the complaint. The investigation will include, at a minimum, the following steps:
   - interviews with each of the complainant and the respondent
   - interviews with others identified as witnesses
   - review of any relevant documents submitted to the investigator

   If appropriate, the respondent may be placed on a leave of absence during the investigation.

4. It is expected that the investigation of a complaint will be completed within sixty (60) days of receipt of the complaint. This timeline, however, is subject to change depending on various factors, including but not limited to, the complexity of the investigation.

5. Within thirty (30) days of the conclusion of the investigation, the investigator shall issue to the Title IX Coordinator, and, if appropriate, the Office of General Counsel, a written report of the findings and conclusions of the investigation. The report will provide a determination of the merits of the complaint related to Title IX and, if applicable, options for substantive resolution of the complaint and recommendations for corrective measures. The Title IX Coordinator shall review the written report and submit it to the Dean within five (5) days of receipt of the report.

6. The Dean shall make a decision based on the record and shall notify the complainant and the respondent in writing of the decision and the basis for the decision, including any corrective action to be taken, within fifteen (15) days of receipt of the investigator's report.

7. If a violation of Title IX occurred, sanctions will be imposed and actions will be taken to prevent any further discrimination or harassment. Depending on the severity of the case, possible sanctions include, but are not limited to:

- verbal counseling/training
- a formal written warning placed in respondent's file
- transfer of advisees and/or removal from positions of administrative responsibility
- removal from a supervisory position
- enforced leave of absence/suspension
- termination of employment or permanent dismissal

IV. Appeal

A. If the complainant is not satisfied with the Dean's decision, the complainant may file a written appeal to Corporate Compliance Officer. The written appeal must include a detailed statement of the basis of the appeal. The Corporate Compliance Officer shall notify the complainant of the final decision within thirty (30) days of receipt of the appeal.

V. General Considerations

A. Retaliation Prohibited. No person shall be subject to discharge, suspension, discipline, harassment or any form of discrimination for having used or having assisted others in using the grievance process. The Title IX Coordinator will, where warranted, investigate a complaint of alleged retaliation in the same manner as is described herein.

B. Calculation of Time. Saturdays, Sundays and holidays shall be disregarded in calculating time periods specified in these grievance procedures.

C. Respondent Not a Student or Employee. If the respondent is not enrolled at or employed by the School, there may be additional procedures that apply. For example, if a respondent were a member of the City of Hope National Medical Center Medical Staff, the provisions of City of Hope's Harassment Policy addressing harassment by a member of the Medical Staff would be applied.

FERPA-FAMILY EDUCATIONAL RIGHTS AND PRIVACY ACT

The Family Educational Rights and Privacy Act (FERPA) affords eligible students certain rights with respect to their education records. (An "eligible student" under FERPA is a student who is 18 years of age or older or who is attends a postsecondary institution.) These rights include:

1. The right to inspect and review your education records within 45 days after the day IMGS receives a request for access. A student should submit to the

Registrar a written request that identifies the record(s) the student wishes to inspect. The Registrar will make arrangements for access and notify the student of the time and place where the records may be inspected. If the records are not maintained by the Registrar to whom the request was submitted, that Registrar shall advise the student of the correct official to whom the request should be addressed.

2. The right to request an amendment to your student education records that you believe is inaccurate, misleading, or otherwise in violation of the privacy rights under FERPA.

   A student who wishes to ask the IMGS to amend a record should write to the Registrar to identify clearly the part of the record the student wants changed and specify why it should be changed.

   If the IMGS decides not to amend the record as requested, the Registrar will notify the student in writing of the decision and the student's right to a hearing regarding the request for amendment. Additional information regarding the hearing procedures will be provided to the student when notified of the right to a hearing.

3. The right to provide written consent before the graduate school discloses personally identifiable information (PII) from the student's education records, except to the extent that FERPA authorizes disclosure without consent.

   The school discloses education records without a student's prior written consent under the FERPA exception for disclosure to school officials with legitimate educational interests or in the case the information is designated as directory information.

4. The right to file a complaint. An eligible student has the right to file a complaint with the U.S. Department of Education concerning alleged failures by IMGS to comply with the requirements of FERPA. The name and address of the Office that administers FERPA is:

   Family Policy Compliance Office
   U.S. Department of Education
   400 Maryland Avenue, SW
   Washington, DC 20202 FORMATTING

Definitions

Directory Information: Under FERPA directory information is information contained in a student's education record that generally would not be considered harmful or an invasion of privacy if disclosed. Institutions may

disclose designated directory information without written consent at the discretion of the Registrar. The IMGS considers the following to be directory information:

- Name
- Email address
- Program
- Dates of attendance
- Enrollment status
- Degree status
- Major Field of Study
- Awards received including honors, scholarships, fellowships, grants and dean's list Photographic, video or electronic images

If you do not want IMGS to disclose directory information from your education records without written consent, you must notify the Registrar in writing.

Note: Once a student's record has been made confidential, no information can be shared about the individual without the student's written consent. In such a case, problems may occur thereafter when potential employers or other parties make inquiries about the student.

Education Records: An education record is defined as any information or data that is directly related to a student and is maintained by an educational agency, or institution, or by a party acting for the agency or institution. Education records include any information or data recorded in any medium.

Examples of education records include, but are not limited to the following:

- Academic assessments
- General counseling and advising records
- Disciplinary records
- Financial aid records
- Admissions information for students who are accepted and enrolled
- Biographical information (date and place of birth, gender, nationality, race and ethnicity, and identification photographs)
- Course work, schedules or communication that are part of the academic process

Education records DO NOT include (narrowly defined):

- Records in the sole possession of the maker
- Law enforcement records
- Employment records when employment is not contingent on being a student

- Medical or psychological treatment records
- Alumni records

School Official: A school official is a person employed by IMGS in an administrative, managerial, academic, research, or support staff position (including human resources and health staff); a person serving on the board or committee; or a student serving on an official committee, such as a disciplinary or grievance committee. A school official also may include a volunteer or contractor outside IMGS who performs an institutional service of function for which the school would otherwise use its own employees and who is under the direct control of the Graduate School with respect to the use and maintenance of educational records, such as an attorney, auditor, collection agent, a hosted software company or a verification agency.

Legitimate Educational Interest: A school official has a legitimate educational interest when the official needs to review an education record in order to fulfill their responsibility on behalf of the graduate school, such as when the official is performing a task that is specific in their job description, or by a contract agreement, or other official appointment; performing a task related to a student's education; performing a task related to the discipline of a student; or providing a service or benefit relating to the student or student's family, such as health care, counseling, job placement, or financial aid.

The complete regulations and full definitions of terminology are on the U.S. Department of Education site.

Appendix B: Important Contacts

IMGS Direct Line: (877) 715-4723 or extension 60518

Lyra makes it easier to find and receive confidential, personalized, short-term mental health care. Their online platform allows you to sign up in just a few clicks, find the right coach or therapist for your needs, and quickly book an appointment in-person or via live video. You and your spouse or domestic partner, dependents under age 26 and household members are each eligible for up to 12 sessions per year with a Lyra Therapist or coach covered at no cost to you.

- Register at coh.lyrahealth.com
- Complete a brief wellness questionnaire to receive personalized care recommendations
- Review high-quality coaches and therapists matched to your needs.
- Book an appointment in-person or via video as early as the next day or tap into self-care apps.

Learn more at coh.lyrahealth.com; care@lyrahealth.com; 877-672-1266

Work-Life Services
Are also available to help you resolve emergencies, guide you through challenges and help you stay on top of your busy life. Services available to support you include legal and financial consultations, identity theft support and child, elder and pet care resources and referrals. Click here to access the Work-Life Services flier. ***Use access code: Lyra-Coh**.

Employee Health Services
Onsite Support: Dr. Monica Martinez providermartinezrmonica@gmail.com

Security:

Emergency **on Duarte Campus:** Call 55 or 626-218-5555

Emergency **off Campus**: Call 911

If you are uncomfortable walking to your vehicle call security (ext. 84000) and they will take you.

Shuttles: Shuttle Services approximately every ½ hour between the hours of 7:00 am and 4:30 pm. If shuttle is needed before or after those hours call ext. 82006 or 626-218-2006 for assistance.

ITS: Computer Support 84357 or (626) 218-4357

Title IX Coordinator: Joline Treanor, Chief Human Resource Officer, email: jtreanor@coh.org