

## GS04 1253 -- Principles in Genetics & Epigenetics

### Syllabus - Spring 2022

**In-person Class** (based on current announcements by MD Anderson and UTHealth)

**Tuesday & Thursday, 10:30 am – 12:00 noon**

**BSRB S3. Large Classroom**

Date, Day	Lecture Topic	Lecturer
January 11, Tu	<i>The structure of the genome</i>	Sen
January 13, Th	<i>Chromosomes and aneuploidy</i>	Cole
January 18, Tu	<i>Genetic screens</i>	Mattox
January 20, Th	<i>RNA interference</i>	Arur
January 25, Tu	<i>Transgenic animals</i>	Behringer
January 27, Th	<i>Conditional genetic manipulations</i>	Wang
February 1, Tu	<i>Molecular basis of disease phenotype-genotype</i>	Hixson
February 3, Th	<i>Next generation DNA sequencing</i>	Fornage/Krahe
February 8, Tu	<i>Current human genetic approaches to gene discovery for multifactorial disorders</i>	Fornage
February 10, Th	<i>Applications of genetic information to health outcomes in multifactorial disorders</i>	Fornage
February 15, Tu	<i>Medical genetics services &amp; clinical risk assessment</i>	Singletary
February 17, Th	<i>Genetic basis of cancer</i>	Huff/Krahe
February 22, Tu	<i>Case study: Cancer genetics</i>	Huff/Krahe
February 24, Th	<i>Functional validation of Variants in Disease Candidate Genes</i>	Karras
March 1, Tu	<i>RNA-Seq Workshop</i>	Liu
March 3, Th	<i>RNA-Seq Workshop</i>	Liu
March 8, Tu	<i>RNA-Seq Workshop</i>	Liu
March 10, Th	<i>RNA-Seq Workshop</i>	Liu
<b>March 14-18</b>	<b>Spring Break – No class</b>	
March 22, Tu	<i>Gene precision therapies and stem cell therapeutics</i>	McDonnell
March 24, Th	<i>The microbiome in human disease</i>	Hanis
March 29, Tu	<i>Epigenetics &amp; expression of the genome</i>	Cheng
March 31, Th	<i>Epigenetics techniques: bench skills</i>	Jain
April 5, Tu	<i>Histone code (writers &amp; erasers)</i>	Lee
April 7, Th	<i>Histone code (readers)</i>	Bedford
April 12, Tu	<i>DNA methylation</i>	Huang
April 14, Th	<i>Imprinting &amp; X inactivation</i>	Chen
April 19, Tu	<i>Histone variants</i>	Bartholomew
April 21, Th	<i>ATP-dependent chromatin remodelers</i>	Bartholomew
April 26, Tu	<i>Non-coding RNAs</i>	Calin
April 28, Th	<i>Epigenetics and cancer therapeutics</i>	Santos
<b>May 2-6</b>	<b>Final Exams</b>	

## Course Description

The course is organized into three general sections: 1. Experimental Genetics, 2. Human Genetics, and 3. Epigenetics. **There will also be a hands-on bioinformatics workshop to learn how to process and analyze RNA-seq data.**

This course fulfills a requirement of the Genetics & Epigenetics Graduate Program.

## RNA-Seq Workshop

This hands-on workshop will teach you how to process and analyze sequence data to assess and compare transcriptomes. You can use your own sequence data, use datasets in public repositories, or we will provide sequence datasets.

## Course Directors

### Krahe, Ralf

Dept. of Genetics  
UTMDACC  
Office: S13.8316b  
Phone: 713-834-6345  
Email: [rkrahe@mdanderson.org](mailto:rkrahe@mdanderson.org)

### Kapoor, Ashish

Institute of Molecular Medicine  
Center for Human Genetics  
University of Texas Health Science Center  
at Houston  
Office: SRB 530C  
Phone: 713-500-2439  
Email: [ashish.kapoor@uth.tmc.edu](mailto:ashish.kapoor@uth.tmc.edu)

### Almeida Santos, Margarida

Dept. of Epigenetics & Molecular  
Carcinogenesis  
UTMDACC  
Office:  
Phone: 713-834-6262  
Email: [MIAlmeidaSantos@mdanderson.org](mailto:MIAlmeidaSantos@mdanderson.org)

## Lecturers

### Arur, Swathi

Dept. of Genetics  
UTMDACC  
Office: S11.8116a  
Phone: 713- 745-8424  
Email: [sarur@mdanderson.org](mailto:sarur@mdanderson.org)

### Bartholomew, Blaine

Dept. of Epigenetics & Molecular  
Carcinogenesis  
UTMDACC  
Office: Science Park  
Phone: 512-237-9324  
Email: [bbartholomew@mdanderson.org](mailto:bbartholomew@mdanderson.org)

### Bedford, Mark

Dept. of Epigenetics & Molecular  
Carcinogenesis  
UTMDACC  
Office: Science Park  
Phone: 512-237-9539  
Email: [mtbedford@mdanderson.org](mailto:mtbedford@mdanderson.org)

### Behringer, Richard

Dept. of Genetics  
UTMDACC  
Office: S11.8136A  
Phone: 713-834-6327  
Email: [rrb@mdanderson.org](mailto:rrb@mdanderson.org)

### Calin, George

Dept. of Epigenetics & Molecular  
Carcinogenesis  
UTMDACC  
Office: 3SCR4.3424  
Phone: 713-792-5461  
Email: [gcalin@mdanderson.org](mailto:gcalin@mdanderson.org)

**Chen, Taiping**

Dept. of Epigenetics & Molecular  
Carcinogenesis  
UTMDACC  
Office: Science Park  
Phone: 512-237-9479  
Email: [tchen2@mdanderson.org](mailto:tchen2@mdanderson.org)

**Cheng, Xiaodong**

Department of Molecular & Cellular  
Oncology  
UTMDACC  
Office: S9.8336C  
Phone: 713-834-6274  
Email: [xcheng5@mdanderson.org](mailto:xcheng5@mdanderson.org)

**Cole, Francesca**

Dept. of Epigenetics & Molecular  
Carcinogenesis  
UTMDACC  
Office: Science Park  
Phone: 512-237-9464  
Email: [fcollection@mdanderson.org](mailto:fcollection@mdanderson.org)

**Daiger, Stephen**

Dept. of Epidemiology, Human Genetics  
and Environmental Sciences  
University of Texas Health Science Center  
at Houston  
Office: RAS W-522  
Phone: 713-500-9829  
Email: [stephen.p.daiger@uth.tmc.edu](mailto:stephen.p.daiger@uth.tmc.edu)

**Fornage, Myriam**

Institute of Molecular Medicine  
University of Texas Health Science Center  
at Houston  
Office: SRB 530F  
Phone: 713-500-2463  
Email: [Myriam.Fornage@uth.tmc.edu](mailto:Myriam.Fornage@uth.tmc.edu)

**Hanis, Craig**

Dept. of Epidemiology, Human Genetics  
and Environmental Sciences  
University of Texas Health Science Center  
at Houston  
Office: RAS E-423  
Phone: 713-500-9807  
Email: [craig.l.hanis@uth.tmc.edu](mailto:craig.l.hanis@uth.tmc.edu)

**Hixson, James**

Dept. of Epidemiology, Human Genetics  
and Environmental Sciences  
University of Texas Health Science Center  
at Houston  
Office: RAS W-422  
Phone: 713-500-9834  
Email: [james.e.hixson@uth.tmc.edu](mailto:james.e.hixson@uth.tmc.edu)

**Huff, Vicki**

Dept. of Genetics  
UTMDACC  
Office: S15.8316a  
Phone: 713-834-6384  
Email: [vhuff@mdanderson.org](mailto:vhuff@mdanderson.org)

**Jain, Abhinav**

Dept. of Epigenetics & Molecular  
Carcinogenesis  
UTMDACC  
Office: S9.8136b  
Phone: 713-794-6366  
Email: [ajain@mdanderson.org](mailto:ajain@mdanderson.org)

**Karras, Georgios**

Dept. of Genetics  
UTMDACC  
Office: S12.8136  
Phone: 713-834-6352  
Email: [GKarras@mdanderson.org](mailto:GKarras@mdanderson.org)

**Lee, Min-Gyu**

Dept. of Molecular and Cellular Oncology  
UTMDACC  
Office: Y7.6028  
Phone: 713-792-3678  
Email: [mglee@mdanderson.org](mailto:mglee@mdanderson.org)

**Liu, Bin**

Dept. of Epigenetics & Molecular  
Carcinogenesis  
UTMDACC  
Office: Science Park  
Phone: 512-237-9437  
Email: [bliu1@mdanderson.org](mailto:bliu1@mdanderson.org)

**Mattox, William**

GSBS  
Phone 713-745-4866  
Office: BSRB S3.8447  
Email: [William.Mattox@uth.tmc.edu](mailto:William.Mattox@uth.tmc.edu)

**McDonnell, Timothy**

Dept. of Hematopathology  
UTMDACC

Office: Y5.6006a

Phone: 713-792-8925

Email: [tmcdonne@mdanderson.org](mailto:tmcdonne@mdanderson.org)

**Sen, Subrata**

Dept. of Translational Molecular Pathology  
UTMDACC

Office: LSP9.4013

Phone: 713-834-6040

Email: [ssen@mdanderson.org](mailto:ssen@mdanderson.org)

**Singletary, Claire**

Departments of Pediatrics and Obstetrics,  
Gynecology, & Reproductive Sciences  
University of Texas Health Science Center at  
Houston

Office: UPB Suite 1217

Phone: 713-486-2294

Email: [claire.n.singletary@uth.tmc.edu](mailto:claire.n.singletary@uth.tmc.edu)

**Wang, Jun**

Dept of Pediatrics, MCG MS  
University of Texas Health Science Center at  
Houston

Office: MSB 3.236B

Phone: 713.500.5723

Email: [jun.wang@uth.tmc.edu](mailto:jun.wang@uth.tmc.edu)