IMPORTANT: This syllabus form should be submitted to OAA (gsbs_academic_affairs@uth.tmc.edu) a week before the start of each semester.

NOTE to STUDENTS: If you need any accommodations related to attending/enrolling in this course, please contact one of the Graduate School's 504 Coordinators, Cheryl Spitzenberger or Natalie Sirisaengtaksin. We ask that you notify GSBS in advance (preferably at least 3 days before the start of the semester) so we can make appropriate arrangements.

Term and Year: **Fall 2023**

Course Number and Course Title:
GS14 1183: Biology of Neurological Diseases

Credit Hours: 3

Meeting Location: **UT MDACC**

Building/Room#: **BSRB S3.8112**
(GSBS Computer Lab)

WebEx/Zoom Link:
https://mdacc.zoom.us/j/86893866500?pwd=WjdtZWZrOWt1d2d6enpQaFRTYkFCdz09
Meeting ID: **868 9386 6500**
Password: **232610**

Program Required Course: **No**

Approval Code: **No**

Audit Permitted: **Yes**

Classes Begin: **August 29, 2023**

Classes End: **December 15, 2023**

Final Exam Week: **No final exam**

Class Meeting Schedule

Day	Time
Tuesday (Lecture)	**1:00-3:00 PM**
Thursday (Review & JC Discussion)	**1:00-2:00 PM**

Course Director

Name and Degree: **Sheng Zhang, PhD**
Title: **Associate Professor**
Department: I**MM & NBA**
Institution: ***UTH***
Email Address: Sheng.Zhang@uth.tmc.edu
Contact Number: (713) 500-3493

Course Co-Director/s:

Name and Degree: **Jian Hu, PhD**
Title: Associate Professor
Department: Cancer Biology
Institution: *MDACC*
Email Address: jhu3@mdanderson.org
Contact Number: 713-794-5238

Instructor/s

1. **Sheng Zhang, PhD**
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   Institute of Molecular Medicine
   Department of Neurobiology and Anatomy
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   Sheng.Zhang@uth.tmc.edu

2. **Jian Hu, PhD**
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   Cancer Biology
   The University of Texas MD Anderson Cancer Center
   jhu3@mdanderson.org

3. **Wei Cao, PhD**
   Professor, Center for Periopertive Medicince
   Dept. of Anesthesiology
   UTHealth Houston| McGovern Medical School
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NOTE: Office hours are available by request. Please email me to arrange a time to meet.

Teaching Assistant:

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4. **Andrey Tsvetkov, PhD**
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5. **Consuelo (Chelo) Walss-Bass, PhD**
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6. **Myriam Fornage, PhD, FAHAD**
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7. **Edgar T. Walters, PhD**
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Fondren Chair in Cellular Signaling
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8. **Jason R Thonhoff, MD, PhD**
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9. **Rodrigo F. Morales, PhD**
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10. **Yon Son Betty Kim, MD, PhD**
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11. **Wen Jiang, MD, PhD**
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12. **Kartik Venkatachalam, PhD**
Associate Professor
Department of Integrative Biology and Pharmacology
UTHealth Houston| McGovern Medical School
Kartik.Venkatachalam@uth.tmc.edu

Course Description:
This course will focus on the etiologies underlying major neural diseases. Led by GSBS faculty with related expertise, the course will review representative neural diseases and discuss seminal research papers in the respective fields, with emphasis on the current understanding of these diseases at molecular, cellular, and system levels. By completing this course, students should grasp the knowledge of the fundamental biology of major neural diseases, appreciate the common and distinctive mechanisms underlying these diseases, learn the existing hypotheses and experimental paradigms as well as outstanding questions and main challenges in the field, and hone the ability to develop novel strategies for scientific and translational discoveries for this unique group of diseases.

Textbook/Supplemental Reading Materials (if any)

- No textbook
- List of reading materials will be provided weekly by lecturing instructors

Course Objective/s:

Upon successful completion of this course, students will have a broad understanding of the basic biology, existing hypotheses, experimental paradigms and major challenges related to major neural diseases, and learn to develop new hypotheses and strategies to tackle these unique diseases.

***Specific Learning Objectives*:**

1. Learn the basics of neuropathology of major neural diseases,.nderstand the shared and distinct pathologic and molecular features associated with the diseases
2. Gain knowledge on the genetic, molecular and cellular basis of major neural diseases, understand the existing hypotheses and major controversies regarding the molecular and cellular mechanisms of these diseases.
3. Learn the methods and model systems used to study these diseases, their strength, and shortcomings.

4. Distill scientific literature into key elements and findings, identify shortcomings and propose future directions.
5. Apply the knowledge learned to develop new hypotheses and experiments to test them.

Student responsibilities and expectations:

Enrolled students are expected to complete the following activities:

1. Read 1-2 review papers relating to the week's topics assigned by the lecturers
2. Read 1-2 primary research articles assigned by the week's lecturer
3. Write one 1-2 page literature synopses for one of the assigned research articles (see Course Grading for more detail)
4. Present and lead a discussion on research papers in the weekly review and journal club (JC) session
5. Participate in and contribute to course discussions during lecture and JC review sessions

Students are expected to complete all assigned reading material (reviews and research papers) prior to class. You are encouraged to work and discuss all course materials and assignments in groups, but all writing assignments must be your own.

Grading System: Letter Grade (A-F)

Student Assessment and Grading Criteria: A total of 520 points is available during the course. Grade (A-F) based on % of points you earned) will be determined by the following items.

Percentage	Description
Literature Synopses (~80%) (30 points/synopses, 420 points total)	For each week's lecture, students will be assigned 1 review paper and 1-2 primary research papers to read critically. Students will choose one of the assigned papers to write a one-page synopsis that (1) describe the questions, method/experimental design and key findings; (2) identify potential shortcomings in the paper or new questions arising from the paper, and suggest some follow-up studies to address them. The students will have one week to complete each synopses.
Lecture Attendance and Participation (~5 %) (2 point/lecture, 28 points total)	Students are encouraged to be physically present for lecture. Students are encouraged to ask questions and engage in discussion with classmates and instructors during lecture, and to submit written questions or discussion points after class.
Review/JC Attendance and Participation (~5 %) (2 point/JC session, 28 points total)	Students are expected to be physically present and actively engaged in JC discussion.
JC presentation (~8% and higher) (22 point/JC presentation, 44 points total expected, but 10 bonus points can be earned/as leader of each additional JC session).	Students are expected to sign up to lead at least two of the JC sessions during the semester together with the leading faculties of the week. Multiple students can join together to lead each JC session.

CLASS SCHEDULE - Biology of Neurological Diseases -Fall 2023

Week	Date Tuesday 1-3:00pm Thursday 1-2pm	Duration (Hours taught by Lecturer)	Lecture Topic	Instructors
1	**August 29, 2023**	**2**	**1. Course introduction** **2. Overview of neural diseases**	**Sheng Zhang, Ph.D.** **Jian Hu, Ph.D.**
	August 31, 2023	**1**	Review/JC	Sheng Zhang, Ph.D. Jian Hu, Ph.D.
2	**September 5, 2023**	**2**	**Alzheimer's disease**	**Antonio L Teixeira, MD, PhD**
	September 7, 2023	**1**	Review/JC	Antonio L Teixeira, MD, PhD Sheng Zhang, Ph.D. Jian Hu, Ph.D.
3	**September 12, 2023**	**2**	**Tau and tauopathy**	**Sheng Zhang, PhD**
	September 14, 2023	**1**	Review/JC	Sheng Zhang, PhD Jian Hu, PhD
4	**September 19, 2023**	**2**	**Parkinson's diease:** **Dopmaine pathways, mitochondria and membrane dynamics in PD etiology**	**Sheng Zhang, PhD**
	September 21, 2023	**1**	Review/JC	Sheng Zhang, PhD Jian Hu, PhD
5	**September 26, 2023**	**2**	**Amyotrophic lateral sclerosis (ALS) and other Motor neuron diseases (MNDs)**	**Jason R Thonhoff, MD, PhD**
	September 28, 2023	**1**	Review/JC	Jason R Thonhoff, MD, PhD Sheng Zhang, PhD Jian Hu, PhD
6	**October 3, 2023**	**2**	**Prion diseases**	**Rodrigo F. Morales, PhD**
	October 5, 2023	**1**	Review/JC	Rodrigo F. Morales, PhD Sheng Zhang, Ph.D. Jian Hu, Ph.D.
7	**October 10, 2023**	**2**	**Nucleotide repeat diseases and Polyglutamine diseases**	**Andrey Tsvetkov, PhD**
	October 12, 2023	**1**	Review/JC	Andrey Tsvetkov, PhD Sheng Zhang, PhD Jian Hu, PhD
8	**October 17, 2023**	**2**	**Lysosomal storage diseases**	**Kartik Venkatachalam, PhD**

8	**October 19, 2023**	**1**	Review/JC	**Kartik Venkatachalam, PhD** Sheng Zhang, PhD Jian Hu, PhD
9	**October 24, 2023**	**2**	**Mental Health Disorders**	**Consuelo Walss-Bass, PhD**
	October 26, 2023	**1**	Review/JC	Consuelo Walss-Bass, PhD Sheng Zhang, PhD. Jian Hu, PhD
10	**October 31, 2023**	**2**	**Mental Health Disorders**	**Consuelo Walss-Bass, PhD**
	November 2, 2023	**1**	Review/JC	Consuelo Walss-Bass, PhD Sheng Zhang, PhD. Jian Hu, PhD
11	**November 7, 2023**	**2**	**Stroke and Related Diseases**	**Jarek Aronowski, MD, PhD**
	November 9, 2023	**1**	Review/JC	Jarek Aronowski, MD, PhD Sheng Zhang, PhD. Jian Hu, PhD
12	**November 14, 2023**	**2**	**Brain Tumors**	**Yon Son Betty Kim, MD, PhD** **Wen Jiang, MD, PhD**
	November 16, 2023	**1**	Review/JC	Yon Son Betty Kim, MD, PhD Wen Jiang, MD, PhD Sheng Zhang, PhD Jian Hu, PhD
	11/20-24/2023	**Thanksgiving week, no class**		
13	**November 28, 2023**	**2**	**Multiple sclerosis & Demyelinating dieases**	**Jian Hu, PhD**
	November 30, 2023	**1**	Review/JC	Jian Hu, Ph.D Sheng Zhang, Ph.D.
14	**December 5, 2023**	**2**	**Neuropathic pain**	**Edgar T. Walters, Ph.D.**
	December 7, 2023	**1**	Review/JC	Edgar T. Walters, PhD Sheng Zhang, Ph.D. Jian Hu, Ph.D
15	**December 11-15, 2023**	**End of class, individual Q/A sessions with instructors by advanced appointments are welcome.**		