# Fundamentals of Translational Science
# ANAT6182 - Fall 2019
# Meeting time: M, T, W 10:00 AM – 12:00 Noon
# Ross Hall 529

**Course Director:**
Alex Tzatsos: 800 22nd St NW SEH 8850, atzatsos@gwu.edu, t: 202-994-9104

**Course Description**
In this course, students will attain knowledge about the fundamentals of organ development and study how molecular defects during development could lead to disease. In Part I, students are introduced to development of several organs (liver, lung, pancreas, skin) and the hematopoietic system, and will study how deregulation of these processes subverts cell fate decisions to cause cancer. Part II focuses on neural and craniofacial development and will highlight how defects in these processes could cause hereditary diseases. The students will also be familiar with additional concepts such as how tissue structure relates to tissue function, how injury leads to dysfunction and its clinical symptoms, and how knowledge of molecular defects could be exploited for therapeutic purposes.

**Course Format:**
Monday: basic science lecture
Tuesday: related clinical science lecture
Wednesday: class discussion of assigned papers and quizzes

**Learning Outcomes**
As a result of completing this course, students will be able to:
1. Comprehend the molecular mechanisms of organ development and be familiar with the progenitor populations.
2. Understand how defects in developmental processes alter cell fate decisions to cause hereditary disease and predispose to cancer.
3. Critically read and evaluate peer-reviewed papers linked to organ development and disease.

## Part I: Weeks 1-4. Organ development and Cancer

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| **Oct. 14** | Development of gut accessory organs (liver, pancreas, gallbladder) | Tzatsos |
| **Oct. 15** | Pancreatic and hepatobiliary malignancies | Tzatsos |
| **Oct. 16** | Paper discussion for homework #1 | Tzatsos |
| **Oct. 21** | Hematopoietic development | Tzatsos |
| **Oct. 22** | Hematopoietic malignancies | Tzatsos |
| **Oct. 23** | Paper discussion for homework #2 | Tzatsos |

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| **Oct. 28** | **Exam #1 (8:15 am to 9:45 am)**<br>Skin Development | **In Class**<br>Efimova |
| **Oct. 29** | Skin Cancer | Efimova |
| **Oct. 30** | Paper discussion for homework #3 | Efimova |
| **Nov. 4** | Lung Development | Zheng |
| **Nov. 5** | Lung Cancer | Zheng |
| **Nov. 6** | Paper discussion for homework #4 | Zheng |

## Part II: Weeks 5-8 Organ development and hereditary abnormalities

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| **Nov. 11** | **Exam #2 (8:15 am to 9:45 am)**<br>Cranial placode development | **In Class**<br>Moody |
| **Nov. 12** | Branchio-oto-renal syndrome | Moody |
| **Nov. 13** | Paper discussion for homework #5 | Moody |
| **Nov. 18** | Palate/cranial nerve development | Maynard |
| **Nov. 19** | 22Q11 syndrome and<br>Paper discussion for homework #6 | Maynard |
| **Nov. 20** | **No Class** | **No Class** |

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| **Nov. 25** | **Exam #3 (8:15 am to 9:45 am)**<br>Mitochondrial medicine and its implications for mitochondrial neurodegenerative disorders | **In Class**<br>Chiaramello |
| **Nov. 26** | Mitochondrial medicine and its implications for mitochondrial neurodegenerative disorders | Chiaramello |
| **Nov. 27** | Paper discussion for homework #7 | Chiaramello |
| **Dec. 2** | Corneal development and wound repair | Stepp |
| **Dec. 3** | Corneal development and wound repair | Stepp |
| **Dec. 4** | Paper discussion for homework #8 | Stepp |
| **Dec. 9** | **Exam #4 (8:15 am to 9:45 am)** | **In Class** |

**In accordance with university policy, the final exam will be given during the final exam period and not the last week of the semester. For details and complete policy, see: provost.gwu.edu/administration-final-examinations-during-examination-period**

**Required textbooks, materials, and recommended readings:**
There are no required textbooks. Students will be provided handouts of all lectures, which will also be posted on Blackboard together with any relevant review articles.
Recommended textbooks as references include: Developmental Biology, Tenth Edition by Scott F. Gilbert (Sinauer Associates, Inc.), 2013 **&** Netter's Essential Physiology, by Susan Mulroney & Adam Myers, Saunders 2009.

**Average minimum amount of out-of-class or independent learning expected per week:**
For this course students are expected to spend a minimum of 6 hours of out-of-class study per week on topics and reading assigned during the class.

| Date | Topic(s) and readings | Assignment(s) Due |
|---|---|---|
| Weeks 1-8 | 8 papers (one peer-reviewed paper per week pertinent to the topic covered in the class). Students should thoroughly study the experimental methods and conclusions of the paper. Minimum 6 hours of out-of-class study per week. | Peer-review papers will be assigned every Wednesday pertinent to topics discussed in the class. Questions will be given at the end of the lecture. Answers should be turned in by Sunday for grading. |
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**Assignments**

| Assignment | Description | Total Points |
|---|---|---|
| One peer-review manuscript linked to the topic covered by the instructor. | Students should critically read the paper and answer questions for homework. | Each assignment will be 2.5% of the final grade. Total 8 papers |
| | Total Possible Points | 20% of the final grade |

**Grading**

The final grade will be based on four exams:

- Exam 1 (20%) will be on the material covered in weeks 1-2 and will consist of 24 multiple choice questions; it will be in class exam on **October 29, 2019**;
- Exam 2 (20%) will be on the material covered in weeks 3-4 and will consist of 24 multiple choice questions; it will be in class exam on **November 12**, **2018.**
- Exam 3 (20%) will be on the material covered in weeks 5-6 and will consist of 24 multiple choice questions; it will be in class exam on **November 26, 2018**;
- Exam 4 (20%) will be on the material covered in weeks 7-8 and will consist of 24 multiple choice questions; it will be in class exam on **December 10, 2018**.
- Paper assignments (20%). Every week students will be assigned a peer-reviewed paper. Students should critically read the paper and answer questions for homework.

**University policy on observance of religious holidays**

In accordance with University policy, students should notify faculty during the first week of the semester of their intention to be absent from class on their day(s) of religious observance. For details and policy, see: students.gwu.edu/accommodations-religious-holidays.

**Class Policies**

Class attendance is mandatory. A sign-in sheet will be passed around at the beginning of each class and the attendance list will be maintained by the IBS office. Students with three or more unexcused absences will lose a letter grade in the course. Religious holidays will be observed according to general GWU policy. http://www.gwu.edu/~academic/Teaching/main.htm

Make-up exams will not be given except under exceptional circumstances; i.e., a documented medical emergency.

**Academic Integrity**

We personally support the GW Code of Academic Integrity. It states: “Academic dishonesty is defined as cheating of any kind, including misrepresenting one's own work, taking credit for the work of others without crediting them and without appropriate authorization, and the fabrication of information.” For the remainder of the code, see: http://www.gwu.edu/~ntegrity/code.html

**Safety and security**

In the case of an emergency, if at all possible, the class should shelter in place. If the building that the class is in is affected, follow the evacuation procedures for the building. After evacuation, seek shelter at a predetermined rendezvous location.

**Support for students outside the classroom**

**Disability Support Services (DSS)**

Any student who may need an accommodation based on the potential impact of a disability should contact the Disability Support Services office at 202-994-8250 in the Rome Hall, Suite 102, to establish eligibility and to coordinate reasonable accommodations. For additional information see: disabilitysupport.gwu.edu/

**Mental Health Services 202-994-5300**

The University's Mental Health Services offers 24/7 assistance and referral to address students'

personal, social, career, and study skills problems. Services for students include: crisis and emergency mental health consultations confidential assessment, counseling services (individual and small group), and referrals. For additional information see: counselingcenter.gwu.edu/

## Fundamentals of Translational Science
## ANAT6182 - Fall 2018 - Faculty

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