

## Translational Science Selectives (TSELS)

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This Guide will cover the following information about Translational Science (Tsel) Selectives:

1. Translational Science Selectives Listing
2. How They Work
3. The Rules
4. Guidelines for the Papers

### 1. Translational Science Selectives - Listing

The Translational Science Selectives (aka T sels) are designed to re-acquaint you with some of the important science underlying your clinical practice and to give you practice in reading and discussing that literature prior to residency. We assume that most of you will choose a selective related to the field you are going into (although you are not required to do this) and we think these selectives will help you stand out among your residency classmates.

The current list of electives that will fulfill the requirement, divided by department, is listed below. Please note that Clinical Toxicology is the only EM rotation that fulfills this requirement.

ANES T4012	Pain Management
DERM T4022	Dermatology
EMED T4029	Clinical Toxicology (only offered in January)
MEDI T4151	Allergy-Immunology
MEDI T4102	Cardiology
MEDI T4225	EKG reading (2 weeks, classroom)
MEDI T4120	Gastroenterology (Digestive Diseases)
MEDI T4141	Hematology/Oncology
MEDI T4172	Nephrology
MEDI T4184	Pulmonary Medicine
NERU 4208	Tsel Neuroscience pathway selective (completely asynchronous, 2 wks credit)
NERU 4207	Tsel Epilepsy (2 weeks)
NERU T4211	Neuro-psych epidemiology (classroom course, 2 wks credit)
OBGY T4315	Reproductive Endocrinology (science aspect requires approval from course director)
OBGY T4319	Urogynecology
OTOL T4358	Otolaryngology (2 wk Adult)

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OTOL T4481	PEDS Otolaryngology (2 wk PEDS, not 4 wk)
OPHTH T4350	Ophthalmology
PATH T4369	Human Immunology (2 wks, mostly classroom)
PATH T4376	Neuropathology
PATH T4378	UHB Path Elective
PEDS T4422	Pediatric GI
PEDS T4421	Pediatric Endocrinology (Staten Island)
PEDS T4434	PEDS HEM/ONC
PEDS T4441	Peds Immuno & Allergy
PEDS T4448	Adolescent HIV
PSYH T4505	Chemical dependency
PSYH T4525	Geriatric Psychiatry
RADI T4567	Musculoskeletal radiology (currently has the required radiology course as prerequisite)
RONC T4563	Radiation oncology

**Additional options may be added as we go forward.**

### 2. How They Work

You will attend the elective you've chosen, participate in the clinical or other work, attend the conferences and didactic activities as usual, and receive a grade (H, HP, P, F) from your clinical supervisor for that portion of the elective. **In addition**, you will meet with a designated science supervisor at the beginning of the rotation, choose a topic to study (generally from an approved list), and **produce a scholarly product**, either a paper or less commonly a presentation, by a deadline toward the end of the rotation. The supervising faculty member will give you feedback on your paper or presentation. The scholarly aspect of the selective will be graded pass/fail.

There are a few exceptions to this model:

- **Clinical Neuroscience**, Course Director and contact person – Lisa Merlin  
270-3957

Asynchronous. Students will participate in the Department of Neurology Mystery Case of the Month. A case is posted at the beginning of the month (September through May) and a written case analysis (approximately one page) is due by the end of the month.

For students already participating in the Clinical Neurosciences Pathway the

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requirements for two weeks selective credit in addition to Pathway completion are eight cases completed during fourth year and submission of three original cases with the suggested optimal case analysis.

For students who have not participated in the Pathway, the requirement for two weeks of selective credit is eight cases completed and submission of one original case with its suggested optimal analysis.

This selective does not require any classroom time or block time commitment, nor is there any clinical work.

**Neuro epidemiology**, Course director and contact person – Deborah Gustafson 270-1581      2 wks

NeuroEpidemiology is the study of the occurrence of neurological disorders in human populations. We will overview risk and protective factors for common neurological disorders such as dementia and Alzheimer's disease, stroke, epilepsy, Parkinson's Disease, movement disorders, multiple sclerosis, peripheral neuropathies, traumatic brain injury and migraine/headache. Understanding the epidemiology of neurological disorders requires knowledge of general epidemiology, study design, and biostatistics. In addition, a number of subdisciplines of Epidemiology, such as Molecular and Genetic, Nutritional, Chronic Disease, Infectious Disease and Pharmaco Epidemiology are important. Major challenges to Neuroepidemiology studies include fluctuating neurological and psychiatric symptoms and signs over time, the episodic occurrence of some disorders, and progressive courses that may be modified by co-morbid conditions and events. Thus, some neurological disorders are difficult to track in populations and may vary among populations. Physician versus algorithm-based assessments and diagnoses will be discussed. In addition, both central and peripheral metabolism, genetic susceptibility, cultural variations, and how they interact in neurological health, are keys to understanding etiology of brain-based disorders. Finally, the ultimate goal of Epidemiology and Public Health is disease prevention. Ideas for prevention, especially within the local community, will be discussed.

This course will include lectures, directed readings, an oral presentation, and group assignments to foster critical thinking about the discipline of Neuroepidemiology. Examples from the local community and patient population will be highlighted.

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This selective is entirely in a classroom setting – there is no required clinical work.

### 3. Research Methods in Functional Imaging, 4 weeks, April

Course Director and contact person Randall Barbour 270-1286

**Description:** Functional properties of tissue are time varying and exist on different spatial scales. Investigation of these states can be accomplished using different energy sources that have either external or internal origins. This course will highlight core elements common to the types of investigations feasible by non-invasive functional imaging technologies. Discussed will be elements of technology, experimental design, and data analysis and practical resources needed to accomplish IRB approved clinical investigations.

Students will (1) Generate a peer-reviewable report (7-10 pg) that summarizes the capabilities, challenges and opportunities of a focused area in functional imaging. (2) Present a 'TED' Talk.

Week 1-2:

What tools are available? Magnetic, bioelectric, acoustic, optical, radiotracer

How do things work? Getting under-the-cover

What are interesting tissue targets? Brain, breast, muscle, other

How to ask a meaningful question? The NIH view of scientific research

How to answer interesting questions? Strategies to identify biomarkers

Week 2-3:

Near Infrared Imaging

The hemoglobin signal: Features of neurovascular coupling

Optical methods for measuring brain function

How to perform a brain scan

Week 3-4:

Report Generation

Approval of report outline

Review of 1<sup>st</sup> Draft

Review of Talk outline

Presentation of Talk; Submission of Project Report

This selective does not have any required clinical work.

➤ **Human Immunology, 2 wks**

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Course director and contact person Maya Nowakowski 270-2749

This classroom course teaches the principles, methods, and interpretation of diagnostic immunology tests. Through visits to pertinent labs, students acquire hands on knowledge of diagnostic immunology instrumentation and laboratory assays, e.g. SPEP, flow cytometry, tissue typing, Western blots.

This selective is entirely in a classroom or lab setting – there is no required clinical work.

### **Dr. Oh's elective, 4 weeks**

**Course director and contact person Man Oh 270-**

**This classroom course will include lectures on the following topics:**

1. Two hour interactive lecture on how to learn science and think critically.
2. 3 hour interactive lecture on Free Radicals and Antioxidants.
3. 3 hour interactive lecture on nutrition and vitamins.
4. 3 hour interactive lecture on basic principles of compensation mechanisms.
5. 2 hour interactive lecture on how to write iv fluid orders.
6. 2-4 hour lecture on basic biochemistry of Pathway.
7. One hour lecture on energy (ATP) production mechanism and role of uncoupling .
8. 2 Hour interactive lecture on the principles of transcellular and paracellular transports.
9. Two Hour interactive lecture on the principles of transcellular and paracellular transports.
10. Two hour interactive lecture on G proteins and G-Protein Coupled Receptors.
11. Two hour interactive lectures on eicosanoids (Prostaglandins, Leucotrienes, thromboxanes
12. One hour lecture on energy cost of synthesis and new cell production.
13. 4 hour interactive of interactive lecture on disorders of electrolytes (hyper- and hyponatremia, hyper- and hypokalemia, hyper- and hypocalcemia, hyper- and hyp

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omagnesemia, acid-base disorders).

14. Two interactive hour lecture on immunotherapy.
15. Two hour interactive lecture on basic mechanisms of diseases.
16. .Two hour interactive lecture on hypertension.
17. Two hour interactive lecture on diabetes.
18. Two hour interactive lecture on lipid disorders.
19. Two hour interactive lecture on Exercise physiology.
20. Two hour lecture on a topic of interests selected by the students.

In addition students will choose an area of basic science to focus on and write a standard T sel paper.

There is no required clinical work.

### 3. The Rules

- **Waivers** of this requirement: students enrolled in our MD/PhD program or with a completed PhD in a scientific discipline from another institution do not have to do a science selective. They will do 20 weeks of unrestricted electives instead of 16 weeks of elective and 4 weeks of selective.
- **Due dates:** papers are due on the second Wednesday of a 2-week experience and on the third Thursday of a 4-week experience. Papers must be handed in both to the science supervisor and centrally to the Education office. Presentations, research proposals, and assignments other than papers are due as determined by the course director. These must also be submitted to the Education Office when completed and no later than the last day of the rotation.

No submission to the Education office by the end of the rotation = no credit for the selective, no exceptions

- **Plagiarism:** papers will be run through the SafeAssign software. We will be using a threshold of 20% similarity to published work as our criterion for a satisfactory submission.

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➤ **Late or unsatisfactory work:** For satisfactory completion, written work must be submitted on time and deemed satisfactory by the supervising faculty member.

Late submissions (after the due date but before the end of the rotation) above 20% similarity (if flagged by SafeAssign and confirmed by the preceptor) will result in a grade of Fail.

Late submissions (after the due date but before the end of the rotation) below 20% similarity may be satisfactory if they can reasonably be reviewed with the supervising faculty member before the end of the rotation. Faculty are not obliged to make unreasonable scheduling accommodations (canceling other professional obligations, scheduling outside 10AM - 4PM weekdays the last week of the rotation) nor are they obliged to read anything submitted after the end of the rotation.

On-time but unsatisfactory submissions (e.g. incoherent, inadequate science content) can be re-written if possible within the time constraints. If not possible, as above, you will not receive credit for the selective but will be able to receive credit for the time spent in the clinical elective.

➤ **Meeting with your supervisor:** as soon as you have handed in your paper, make an appointment to meet with your supervisor before the end of the rotation. If you are unable to set an appointment, notify the Office of Education by either the second Thursday (2 week rotations) or the fourth Wednesday (4 week rotations) so we can help you. No meeting with a supervisor = no credit for the selective.

➤ **Grades:** the clinical portion of the selective will be graded as usual, H, HP, P. The Tsel component will be graded pass/fail.

➤ **Dropping the science selective:** if you sign up for a selective and have a change of heart after you start working on your paper, you can withdraw from the science aspect without having to withdraw from the clinical elective aspect so you will not lose the time. You must, of course, sign up for a new selective in a subsequent rotation.

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**Good news:** selectives do not count against your total months within a particular field.

### 4. Guidelines for the Papers

You should meet with the designated science supervisor as soon as possible after starting the rotation. They should have a list of topics for you to choose from or specific papers to give you to write about. We are using this method to save you time. It requires a pretty good knowledge of the literature in a field to choose a topic of just the right scope to allow you to write a paper of the required length without being overwhelmed. **Please note that the topic categories are not necessarily labelled with the names of disciplines that you are working in during the clinical portion of your rotation and your supervisor may not consider his/her work particularly aligned with that discipline.** Regardless of your rotation, the science topics may likely include some variants of the following:

Genetics/genomics  
Membrane biology  
Membrane physiology  
Signaling (intracellular, synaptic, hormonal) and signal transduction  
Cell organization  
Cell biology  
Immunology  
Microbiology  
Biochemistry/metabolism  
Development – cellular aging, senescence, apoptosis  
Cell plasticity  
Pharmacology

For a 2-week experience papers should be about 4-5 pages. For a 4-week experience papers should be about 8-10 pages. Yes, single-spaced, 1 inch margins, and fonts that normal humans are accustomed to using....

Your supervisor may give you very specific directions about your paper - if so, follow them.

If not, read on.....



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A. If your supervisor gives you a specific article on the RANKL/RANK interaction in osteoclasts, for example, the default format should be as follows:

- An explanation of the paper itself
- A review of the background information necessary to understand the significance of the paper (Pretend you are writing to a classmate who doesn't know anything about the subject: the aim is not so much to sound sophisticated as it is to be extremely clear.) This may include both an explanation of the methods used in the paper and a discussion of, for instance, the distribution of RANK and RANKL throughout the body or a discussion of the entire tumor necrosis factor receptor subfamily of molecules and what purposes they serve.
- A brief discussion of the areas of clinical medicine where the phenomenon under discussion may be pertinent.

B. If your supervisor gives you topics like "urinary markers of acute kidney injury", the default format for the paper should be as follows:

- ⊙ A brief summary of the clinical entity or situation the science underlies - no more than a paragraph.
- ⊙ A longer, but still relatively brief overview of the active areas of research in the area.
- ⊙ A detailed discussion and explanation of one or two original articles about pertinent basic or translational science. Explain why the studies were done in the overall context of evolving knowledge, explain how they were done with clear explanation of the methods, explain the findings and discuss any issues with their validity, and finally, explain the relevance of the findings and what they will lead to in further research.

If the subject you are writing about seems impossible to fit into these formats, ask your supervisor for help in deciding on an outline of your paper.