

Course Title: Scientific Reasoning

Course Number: G310

Credits: 1

Course Directors: Mary Baylies, PhD

Course Prerequisites: Open to first year Cancer Biology and Engineering PhD students only

Grading Policy: Pass/Fail

Course Description and Learning Objectives

Scientific reasoning prepares students to think about science deeply and dissect primary literature. During this course you will also learn to present your research and deliver a seminar on your first rotation. Finally, we will use this class to lay a foundation for future courses including framing the mission of MSK and implementing essential computational tools.

Course Structure

The course meets daily from 4-5 hours a day for one week. Changes to that schedule are posted to MOODLE and communicated to students via email.

Assignments and Methods for Assessing Student Achievement

This course is graded on a pass/fail basis; delivering your rotation seminar and class participation will form the basis of the grading.

Course Evaluation

Students are expected to complete surveys regarding the lectures and overall course via Survey Monkey. This feedback will be used to evaluate the effectiveness and relevance of the topics and provide direction for the subsequent iterations of the course.

Academic Dishonesty, Plagiarism and Artificial Intelligence

The Policy can be found in the [Student and Faculty Handbook](#) linked on the GSK Website.

Course Schedule

The course schedule can be found on Moodle, and on the following pages.

Monday, September 7, 2026

Labor Day – No Class

Tuesday, September 8, 2026

8:30 am – 10:30 am – Tours of the Animal Facility – Pat Zanzonico

Students should meet in Z 138 – tours will go in groups of 7/8 as follows:

Group 1 – Meet at 8:15 in Z 138

Group 2 – Meet at 9:00 in Z 138

Group 3 – Meet at 9:45 in Z 138

Group 1:

Adelstein, Anna
Artzi, Dorin
Bui, Hien
Davis, Samantha
Deng, Yiran
Donahue, Rebecca
Hodo, Yuki

Group 2:

Hodson, Isabella
Kapadia, Naviya
Kenum, Carson
Kroepfl, Gabrielle
Lin, William
Parikh, Julie
Patwari, Korey
White, Christian

Group 3:

Pryor, Nora
Schlau, Steven
Tavakoli, Nassim
Uwayesu, Rosine
Xing, Kristi
Xu, Shengze
Yuan, Eric
Zaroogian, Zachary

11:00 am – 1:00 pm – Signal not Noise: How to Give a Scientific Talk – Dr. Mary Baylies – Z668

2:30 pm - 4:30 pm – How to Read and Understand a Scientific Paper – Tal Nawy - Z668

Paper for discussion:

Please let the students know that they should read it and then reflect on how they approached the process. The paper is long and complex; they don't need to understand it all, nor go through every supplementary figure or methods section - we'll be going through parts of it together in the second half of the class.

Reyes J, Del Priore I, Chaikovsky AC, Pasnuri N, Elhossiny AM, Park J, Weiler P, Krause T, Moorman A, Snopkowski C, Takizawa M, Burdziak C, Ratnayeke N, Masilionis I, Ho YJ, Chaligné R, Romesser PB, Filliol A, Nawy T, Morris JP 4th, Zhao Z, Pasca Di Magliano M, Alonso-Curbelo D, Pe'er D, Lowe SW. Oncogenic and tumor-suppressive forces converge on a progenitor niche at the benign-to-malignant transition. *Cell*. 2026 May 14;189(10):2875-2897.e53. doi: 10.1016/j.cell.2026.03.032. Epub 2026 Apr 15. PMID: 41990751; PMCID: PMC13173668.

Wednesday, September 9, 2026

9:00 am – 10:30 am – The Impact of Research on the Mission of MSK - Lecture by Dr. Selwyn Vickers (Breakfast provided 8:45 am); Z668

11:00 am -12:30 pm – Setting up Python and R environments

 Z 668 – Python – CE Students – Tejiri Agbamu

 Z 138 – R – CB Students – Jacob Gutierrez, Sahil Sahn

(Lunch Vouchers provided)

1:00 pm – 4:00 pm - PyMol Training – Joshua Peter – Z668; 3-button mice will be provided. Please see MOODLE site for coursework materials.

Thursday, September 10, 2026

10:00 am - 12:00 pm – Logic and Critical Analysis Session 1 – Dr. Lydia Finley, Z668

Paper for Group 1: Sullivan LB, Gui DY, Hosios AM, Bush LN, Freinkman E, Vander Heiden MG. Supporting Aspartate Biosynthesis Is an Essential Function of Respiration in Proliferating Cells. Cell. 2015 Jul 30;162(3):552-63. doi: 10.1016/j.cell.2015.07.017. PMID: 26232225; PMCID: PMC4522278.

Paper for Group 2: Birsoy K, Wang T, Chen WW, Freinkman E, Abu-Remaileh M, Sabatini DM. An Essential Role of the Mitochondrial Electron Transport Chain in Cell Proliferation Is to Enable Aspartate Synthesis. Cell. 2015 Jul 30;162(3):540-51. doi: 10.1016/j.cell.2015.07.016. PMID: 26232224; PMCID: PMC4522279.

Group 1

Artzi, Dorin – **Student Presenter**

Deng, Yiran

Hodson, Isabella

Kapadia, Naviya

Kroepfl, Gabrielle

Lin, William

Patwari, Korey

Pryor, Nora

Schlau, Steven

Uwayesu, Rosine

Yuan, Eric

Pizza Lunch Provided

Group 2

Adelstein, Anna – **Student Presenter**

Bui, Hien

Davis, Samantha

Donahue, Rebecca

Hodo, Yuki

Kenun, Carson

Parikh, Julie

Tavakoli, Nassim

White, Christian

Xing, Kristi

Xu, Shengze

Zaroogian, Zachary

1:00 pm - 3:00 pm – Rotation Symposium 1 – Z668

Order of Presentation:

Adelstein, Anna
Kapadia, Naviya
Artzi, Dorin
Bui, Hien
Xing, Kristi
Hodson, Isabella
Kroepfl, Gabrielle
Tavakoli, Nassim
Patwari, Korey

Friday, September 11, 2026

10:00 am - 12:00 pm – Logic and Critical Analysis Session 2 – Dr. Agnel Sfeir, Z668

Group A:

Davis, Samantha
Deng, Yiran
Hodo, Yuki
Kapadia, Naviya
Kenum, Carson
Kroepfl, Gabrielle
Schlau, Steven
Tavakoli, Nassim
Uwayesu, Rosine
Xing, Kristi
Xu, Shengze
Zaroogian, Zachary

Group B:

Adelstein, Anna
Artzi, Dorin
Bui, Hien
Donahue, Rebecca
Hodson, Isabella
Lin, William
Parikh, Julie
Patwari, Korey
Pryor, Nora
White, Christian
Yuan, Eric

Discussion Papers Group A (Classic Papers – 3):

Prusiner SB. Prions (Nobel Lecture). Proc. Natl. Acad. Sci. 1998; Nov (95)13363-13383.

Sparrer et al., Evidence for the prion hypothesis: induction of the yeast [PSI⁺] factor by in vitro-converted Sup35 protein. Science. 2000 Jul 28;289(5479):595-9.

Prusiner SB. Novel proteinaceous infectious particles cause scrapie. Science. 1982; Apr9;216(4542):136-44.

Discussion Paper Group B (Contemporary Paper):

EN Neumann et al. Science 2024 Jun 28;384(6703). Brainwide silencing of prion protein by AAV-mediated delivery of an engineered compact epigenetic editor. PMID: 38935715

Pizza Lunch Provided

1:00 pm - 3:00 pm – Rotation Symposium 2 – Z 668

Order of Presentation:

Davis, Samantha

Deng, Yiran

Donahue, Rebecca

Hodo, Yuki

Kenum, Carson

Pryor, Nora

Schlau, Steven

Parikh, Julie

Uwayesu, Rosine