

## **GCB/CAMB 752 – Seminar in Genomics**

Spring 2025: Tuesday 3:30-6:30pm  
BRB II/III Room 253

### **COURSE DIRECTORS:**

**Ingo Helbig, MD**

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**Marijana Vujković, PhD**

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### **TEACHING ASSISTANT:**

**Alexis Garófalo (GCB752 Spring 2024 Class)**

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**COURSE GOALS:** The GCB/CAMB 752 – Seminar in Genomics course is a journal club series with prominent researchers of the Penn faculty and has three separate goals.

First, this course aims to provide exposure to seminal and current omics approaches and applications (including genomics, epigenomics, transcriptomics and proteomics). A second goal is to provide a forum to further develop students' critical thinking skills through literature review and class discussions. A third goal is to develop the skills necessary to search the literature on a given topic and provide a clear and concise review of the research area and to improve scientific writing, an essential step toward identifying gaps in knowledge that may serve as foundations for new research ideas and grant proposals. These goals will be achieved through instructor presentations, readings, class discussions, and a writing assignment. Prerequisite: GCB 531/534 Intro to Genomics, BIOM 550 Genome Regulation or equivalent, or permission of instructor.

**COURSE DESCRIPTION:** The class will meet once a week for a 3-hour period. Each class will involve a faculty member providing an introduction from an experimental and/or computational standpoint of the literature that assumes basic knowledge of the subject. There are two course directors and at least one of them will attend every session. During each class, a faculty member will provide an introduction lasting 15-30 minutes followed by a discussion of 2-3 research papers provided by the lecturer. Typically, two students will be responsible for presenting each paper in a “journal club style” with the lecturer and course directors moderating. This will include an overview of the paper and focusing the paper discussion on the question assigned by the faculty member regarding the paper. All students not presenting are required to post a question or comment on each paper in Canvas under “Discussions”. Each presenter should plan for a 30-minute presentation to allow for discussion.

In addition, as part of participating in the class, two students will be assigned to provide “Omics updates” each class, highlighting recent discoveries or “hot topics” in genomics within a 3-5 min presentation at the beginning and end of the class.

**READING ASSIGNMENTS:** At least one week prior to their session, the lecturer will assign 2-3 primary research papers. The lecturer may also elect to provide a review article that provides relevant background. The lecturer will also assign a discussion question for each paper to guide student reading, critical thinking, and discussion. Students are responsible for reading these materials before each session. Each student is also required to post on CANVAS a question that

they would like student leaders or faculty lecturers to answer during the paper discussion. The students presenting the papers during class will summarize the questions during their presentation.

**WRITING ASSIGNMENT:** There will be one major writing assignment in the format of a Review Article or News and Views. Early in the course, students will propose a topic and set of recent papers on a particular area of genomics. They will be asked to write a review article synthesizing the key ideas in the papers and explaining their significance. Proposed topics/papers will be due on February 10th. Proposed topics will be reviewed and approved by the course directors. Additional details will be provided in class. NOTE: It is highly recommended that BGS students preparing for the preliminary exam utilize this as an opportunity to review the literature pertinent to their exam proposal topic.

**CANVAS:** The course directors will post assigned papers, and questions provided by specific faculty instructors at least one week prior to each class. The students are required to post their questions for each assigned paper by 5 pm the day before the breakout session.

**COURSE GRADE:** The course grade will be based on: 50% writing assignment, 20% paper presentation, and 30% on participation as judged by submitting questions on CANVAS and by presenting Omics updates.

**SYLLABUS (First week is lecture only, paper discussions start Week 2):**

<b>Week 1</b>	21-Jan	Genomics/Genetics: Lecture & Journal Club How-to	Ingo Helbig & Marijana Vujković
<b>Week 2</b>	28-Jan	Rare Variants - Neurogenetics *JC Begins	Ingo Helbig
<b>Week 3</b>	4-Feb	GWAS – Type 2 Diabetes	Marijana Vujković
<b>Week 4</b>	11-Feb	Cancer Genomics	Kara Maxwell
<b>Week 5</b>	18-Feb	Use of Omics in Model Organism	John Murray
<b>Week 6</b>	25-Feb	Transcriptomics and Single Cell RNA Sequencing	Pablo Gonzalez-Camara & Yoseph Barasch
<b>Week 7</b>	4-Mar	Single Cell Omics	Derek Oldridge
<b>Week 8</b>	11-Mar	Spring Break	
<b>Week 9</b>	18-Mar	Pharmacogenomics	Marylyn Ritchie
<b>Week 10</b>	25-Mar	Machine Learning / AI / Phenomics	Danielle Mowery
<b>Week 11</b>	1-Apr	Epigenomics	Wanding Zhou
<b>Week 12</b>	8-Apr	Multi-omics approaches to studying kidney disease	Katalin Susztak
<b>Week 13</b>	15-Apr	No Class	
<b>Week 14</b>	22-Apr	Spatial and Functional Genomics	Allesandra Chesi
<b>Week 15</b>	29-Apr	Neurodevelopmental Disorder Genomics and Models	Maja Bucan & Tom Jongens