The biomedical program has three components—class, journal clubs, and lab. Class will meet in the Levin Auditorium, will begin at 9:00 AM and will run until 11:00 AM. Journal club meetings will be scheduled by the journal club leaders between the hours of 11:15 AM and 1:15 PM. Each journal club will meet for one hour during this time period. Lab begins at 1:30 PM and will usually run until 4:30 PM.

**Executive Director and Lab Coordinator:** Linda Robinson, PhD, Adjunct Assistant Professor
Instructional Laboratory Coordinator
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**Director and Lecturer:** Kieran Dilks, PhD, Penn Biology PhD
High School Teacher, Haddonfield Memorial High School (NJ)
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**Teaching Assistant:**
Jessica Ardis
jardis@sas.upenn.edu

**Journal Club Leaders:** (12)
Ismail Ahmed
Jessica Ardis
Amita Bansal
Sanika Khare
Ruth-Anne Langan
Aurora MacRae-Crerar
Vinayak Mathur
Leon Morales
Son Nguyen
Matt Paul
Timothy Stanek
John Wagner

**Assist. Lab Coordinator:** Svetlana Kozik

**Labs:**

**Lab Section A: Levin L11**
Lab Instructor: Lori Spindler
Lab Assistant: Vinayak Mathur

**Lab Section B: Levin L12**
Lab Instructor: John Wagner
Lab Assistant: Renee Hastings

**Lab Section C: Leidy 114**
Lab Instructor: Aurora MacRae-Crerar
Lab Assistant: Run Jin

**Lab Section D: Leidy 115**
Lab Instructor: Maurice Baynard
Lab Assistant: Jessica Ardis
Course Materials:

Students will receive lab manuals and copies of assigned journal club articles. Each student should also have a notebook, folder, pens/pencils, and calculator, and should bring a laptop computer if you have one. Closed-toed shoes must be worn for afternoon laboratories.

Schedule of Class, Readings, Guest Talks and Laboratories

Monday, July 2nd
9-10 AM: Orientation to Program
10 -11 AM: Introductory Lesson – What is Biomedical Research?

Lab: Module 1 (Pipetting): Introduction, Safety, Pipetting (bring laptops)

Tuesday, July 3rd
9-10 AM: Biomedical Research Ethics
10-11 AM: Guest Research Talk - Dr. Doris Wagner

Lab: Module 2 (Recombinant DNA): Introduction to Module 2, GGA cloning, Paper activity

Wednesday, July 4th
University holiday - no class, journal club or lab!

Thursday, July 5th
9-10 AM: Biomedical Research Techniques
10-11AM: Guest Research Talk - Dr. Nancy Bonini

Lab: Module 2 (Recombinant DNA): Transformations, Transformation exercise (bring laptops)

Friday, July 6th
9-10 AM: Going from Experiment to Model
10-11 AM: Guest Research Talk - Dr. Timothy Linksvayer

Lab: Module 3 (Blood Typing): Introduction to Module 3; Isolate cheek cell DNA, Set up Exon 6 and Exon 7 PCRs
Monday, July 9th
9-10 AM: Guest Research Talk – Dr. Nancy Spinner
10-11 AM: The Birth and Maturation of the Molecular Dogma

Lab: Module 2 (Recombinant DNA): Phenotype analysis (Image J) (bring laptops and camera phones), Pick colonies for cultures, Colony PCR, PCR exercises

Tuesday, July 10th
9-10 AM: Analyzing Nucleic Acids: Diagnostics and Discovery
10-11 AM: Guest Research Talk – Dr. Brian Gregory

Lab: Module 2 (Recombinant DNA): Clean up PCR, Submit for sequencing
Module 3 (Blood Typing): Set up restriction digests of Exon 6 and 7 PCRs, Restriction enzyme and electrophoresis exercises (bring laptops)

Wednesday, July 11th
9-10 AM: Antibiotic Resistance: Time to Panic?
10-11 AM: Guest Research Talk – Dr. Mark Goulian

Lab: Module 2 (Recombinant DNA): Measure expression from cultures
Module 3 (Blood Typing): Exon 6 gel electrophoresis, Restriction Analysis challenge exercises (bring laptops)

Thursday, July 12th
9-10 AM: Molecular Talk Among Viruses Allow Them to Make “Informed” Biological Decisions
10-11 AM: Cancer: Three Rights Make a Left

Lab: Module 3 (Blood Typing): Exon 7 gel electrophoresis, Practice data analysis, Genetics exercise

Friday, July 13th
9-10 AM: The Microbiome as an Ecosystem
10-11 AM: Guest Research Talk - Dr. Brian Keith

Lab: Module 3 (Blood Typing): Analysis of Exon 7 results; Analysis of Module 3 Results and Conclusions
Monday, July 16th
9-10 AM: CRISPR: The Bioengineering Game Changer
10-11 AM: Guest Research Talk – Dr. Michael Lampson

**Lab:** Module 2 (Recombinant DNA): Align sequence (bring laptops), Module 2 Results and Conclusions

Tuesday, July 17th
9-10 AM: It all Begins with Diagnostics
10-11 AM: Guest Research Talk – Dr. Dominic Sisti

**Lab:** Module 4 (Disease Tracking ELISA): ELISA

Wednesday, July 18th
9-10 AM: Biology Psychology
10-11 AM: Guest Research Talk – Dr. Andrew Binns

**Lab:** Module 4 (Disease Tracking ELISA): Disease tracking, Discussion, Evaluations (bring laptops)

Thursday, July 19th
STUDENT JOURNAL CLUB PRESENTATIONS

Friday, July 20st
STUDENT JOURNAL CLUB PRESENTATIONS

Evaluation

**Class**
Students will be evaluated based on performance on in-class questions (via clickers).

**Lab**
Students will be evaluated on lab performance. They will also turn in portions of their lab manuals to their Lab Instructors.

**Journal Clubs**
Students will be evaluated on participation in a small group journal club where they will read and discuss primary scientific literature and then use this information to prepare a group presentation at the end of the program.