The Biomedical Research Academy has three components—lecture, journal clubs, and lab. Lectures will be held in the Levin Building Auditorium (aka Tedori Family Auditorium) and will run from 9-11 AM. Journal club meetings will be held in Fisher-Bennet Hall at either 11:15 AM or 12:15 PM. Lab will be held in Leidy Labs and Levin Labs at 1:30 PM and will run until approximately 4:30 PM.

Executive Director and Lab Coordinator:
Jessica Ardis  jardis@sas.upenn.edu
Lecturer, Department of Biology, University of Pennsylvania

Director and Lecturer:
Kieran Dilks, PhD  kdilks@sas.upenn.edu
Teacher, Haddonfield Memorial High School

Assistant Lab Coordinator:
Svetlana Kozik

Journal Club Leaders:
Romie Azor
Roseanne Davila-Rivera
Samantha Fallacaro
Adam Jabak
Molly Nelson
Sarah Offley
Michael Scaglione
Alexander Starr
Adriana Stephenson
Eliana Von Krusenstiern
John Wagner
Jianfei Zhao

Labs:
Lab Section A:  Levin L11
Lab Instructor: Kelly Gallagher
Lab Assistant: Mark Bray

Lab Section B:  Levin L12
Lab Instructor: John Wagner
Lab Assistant: Sarah Dysinger

Lab Section C:  Leidy 114
Lab Instructor: Courtney Dresden
Lab Assistant: Adriana Stephenson

Lab Section D:  Leidy 115
Lab Instructor: Katie Vazquez
Lab Assistant: Katharine Hewlett

Course Materials:
Students will access the lab manual and copies of assigned journal club articles via Canvas. Each student should also bring a notebook, pens/pencils, and a laptop computer if possible.

Dress Code for Lab:
Some of the materials that you will be working with are hazardous. Therefore, you must dress appropriately. Long pants only. Shorts of any length are prohibited. Open-toed shoes and sandals are prohibited. No part of your foot should be visible. Shirts must cover shoulders, back, and midriff, and must have sleeves.
short-sleeved shirt is acceptable. No part of your abdomen should be visible.

Schedule of Class Topics, Guest Talks and Laboratories

Monday, July 10th

9-10 AM: Orientation to Program
10 -11 AM: Introductory Lesson – Nucleic Acids and the Bead Game

**Lab:** Module 1 (Recombinant DNA): Introduction, Safety, Introduction to Module 1, Design promoters

Tuesday, July 11th

9-10 AM: Introductory Lesson Part 2 - The Biological Divorce of Information Storage and Activity
10-11 AM: Guest Research Talk – Dr. Brian Gregory

**Lab:** Module 2 (Bradford Protein Assay): Pipetting, Introduction to Module 2, Bradford Protein Assay

Wednesday, July 12th

9-10 AM: Guest Research Talk – Dr. Harald Schmidt
10-11 AM: Guest Research Talk – Dr. Nancy Spinner

**Lab:** Module 3 (Blood Typing): Introduction to Module 3; Isolate cheek cell DNA, set up PCRs (Exon 6, Exon 7, Rh factor)

Thursday, July 13th

9-10 AM: Fundamentals of Biomedical Research
10-11 AM: Guest Research Talk – Dr. Nancy Bonini

**Lab:** Module 3 (Blood Typing): Set up restriction digests of Exon 6 and Exon 7 PCRs, Rh factor gel electrophoresis; PCR exercises

Friday, July 14th

9-10 AM: Analyzing Nucleic Acids: Diagnostics and Discovery
10-11 AM: Guest Research Talk - Valerie Sydnor, PhD Candidate

**Lab:** Module 3 (Blood Typing): Exon 6 gel electrophoresis; Analysis of Results from Rh factor gels; Restriction enzyme + electrophoresis exercise

Monday, July 17th

9-10 AM: Biomedical Research Techniques
10-11 AM: Guest Research Talk – Madhura Nijsure, PhD Candidate
**Lab:** Module 1 (Recombinant DNA): GGA cloning with ordered oligos, paper activity, Restriction enzyme challenge activity

**Tuesday, July 18th**

9-10 AM: Antibiotic Resistance: Time to Panic?
10-11 AM: Going from Experiment to Model

**Lab:** Module 1 (Recombinant DNA): Transformations, transformation exercise

**Wednesday, July 19th**

9-10 AM: Molecular Talk - Viruses Making “Informed” Biological Decisions
10-11 AM: Guest Research Talk – Dr. Mechthild Pohlschroder

**Lab:** Module 3 (Blood Typing): Exon 7 gel electrophoresis, Analysis of Results from Exon 6 gels, Genetics of Blood Type Worksheet

**Thursday, July 20th**

9-10AM: Gene Expression Regulation and Disease
10-11 AM: Guest Research Talk – Dr. Scott Poethig

**Lab:** Module 3 (Blood Typing): Blood Typing Results and Conclusions

**Friday, July 21st**

9-10 AM: CRISPR-Cas-9: A Historical Perspective
10-11 AM: Guest Research Talk - Carter Merestein, PhD Candidate

**Lab:** Module 1 (Recombinant DNA): Pick colonies for cultures, Colony PCR, Phenotype analysis (Image J), Estimation of Transformation Efficiency

**Monday, July 24th**

9-10 AM: The Birth and Maturation of the Molecular Dogma
10-11 AM: Guest Research Talk – Dr. Mark Goulian

**Lab:** Module 1 (Recombinant DNA): Clean up PCR, submit for sequencing, Compare ImageJ results and color intensity in cultures versus promoter sequences, Module 1 Results and Preliminary Conclusions

**Tuesday, July 25th**

9-10 AM: The Microbiome as an Ecosystem
10-11 AM: Guest Research Talk – Dr. Michael Lampson
**Lab:** Module 4: (ELISA) Enzyme-linked Immunosorbent Assay (ELISA) to Track a Simulated Disease Outbreak

**Wednesday, July 26th**

9-10 AM: Biomedical Research Ethics  
10-11 AM: Guest Research Talk – Dr. Nicholas Betley  

**Lab:** Module 1 (Recombinant DNA): Align sequences, Module 1 Results and Conclusions

**Thursday, July 27th**

9-11 AM STUDENT JOURNAL CLUB PRESENTATIONS*  
1-3 PM STUDENT JOURNAL CLUB PRESENTATIONS

**Friday, July 28th**

9-12 PM STUDENT JOURNAL CLUB PRESENTATIONS AND ACADEMY CLOSING

*You are expected to attend all student journal club presentation sessions, not just the one at which your group presents.