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 9-10:45 AM. Journal club meetings will be held in Fisher-Bennett Hall from 10:55-11:55 AM. Lab will be held in Leidy Labs and Levin Labs at 1:30 PM and will run until approximately 4:30 PM.

**Director and Lecturer:**  
Kieran Dilks, PhD  
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Teacher, Haddonfield Memorial High School

**Executive Director and Lab Coordinator:**  
Ryan Dilks  
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Teacher, Cherokee High School

**Assistant Lab Coordinator:**  
Svetlana Kozik

**Journal Club Leaders:**  
Romie Azor  
Roseanne Davila-Rivera  
Christine Faunce  
Connor Hennessey  
Adam Jabak  
Mariela Lopez Valencia  
Molly Nelson  
Sarah Offley  
Adriana Stephenson  
Eliana Von Krusenstiern

**Labs:**

**Lab Section A:**  
Levin L11  
**Lab Instructor:** Raegan Petch  
**Lab Assistant:** Sarah Dysinger

**Lab Section B:**  
Levin L12  
**Lab Instructor:** Katie Vazquez  
**Lab Assistant:** Adriana Stephenson

**Lab Section C:**  
Leidy 114  
**Lab Instructor:** Caela Long  
**Lab Assistant:** Eva Agostino

**Lab Section D:**  
Leidy 115  
**Lab Instructor:** Jordan McKinney  
**Lab Assistant:** Maxime Zamba-Campero

**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.** A short-sleeved shirt is acceptable. No part of your abdomen should be visible.
Schedule of Class Topics, Guest Talks and Laboratories

Monday, July 8th
9-10 AM: Orientation to Program
10-11 AM: Introductory Lesson – Nucleic Acids and the Bead Game

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

Tuesday, July 9th
9-10 AM: Introductory Lesson Part 2 - The Biological Divorce of Information Storage and Activity
10-11 AM: Guest Research Talk – TBD

**Lab:** Experiment 2 (Bradford Protein Assay)

Wednesday, July 10th
9-10 AM: Guest Research Talk – TBD
10-11 AM: Guest Research Talk – TBD

**Lab:** Experiment 3 (ELISA Assay and Epidemiology)

Thursday, July 11th
9-10 AM: Fundamentals of Biomedical Research
10-11AM: Guest Research Talk – TBD

**Lab:** Experiment 1 (Recombinant DNA): Part 2: GGA cloning with ordered oligos, paper activity, Restriction enzyme challenge activity

Friday, July 12th
9-10 AM: Analyzing Nucleic Acids: Diagnostics and Discovery
10-11 AM: Guest Research Talk - TBD

Lab: Experiment 1 (Recombinant DNA): Part 3: Transformations, transformation exercise

Monday, July 15th
9-10 AM: Biomedical Research Techniques
10-11 AM: Guest Research Talk – TBD

**Lab:** Experiment 1 (Recombinant DNA): Part 4: Pick colonies for cultures, Colony PCR, Phenotype analysis (Image J), Estimation of Transformation Efficiency
Tuesday, July 16th
9-10 AM: Antibiotic Resistance: Time to Panic?
10-11 AM: Going from Experiment to Model

**Lab:** Experiment 1 (Recombinant DNA): Part 5: Clean up PCR, submit for sequencing, Compare ImageJ results and color intensity in cultures versus promoter sequences, Experiment 1 Results and Preliminary Conclusions

Wednesday, July 17th
9-10 AM: Molecular Talk - Viruses Making “Informed” Biological Decisions
10-11 AM: Guest Research Talk – TBD

**Lab:** Experiment 1 (Recombinant DNA): Part 6: Align sequences, Experiment 1 Results and Conclusions

Thursday, July 18th
9-10AM: Gene Expression Regulation and Disease
10-11 AM: Guest Research Talk – TBD

**Lab:** Experiment 3 (Blood Typing): Part 1: Introduction to Module 3; Isolate cheek cell DNA, set up PCRs (Exon 6, Exon 7, Rh factor)

Friday, July 19th
9-10 AM: CRISPR-Cas-9: A Historical Perspective
10-11 AM: Guest Research Talk - TBD

**Lab:** Experiment 3 (Blood Typing): Part 2: Set up restriction digests of Exon 6 and Exon 7 PCRs, Rh factor gel electrophoresis; PCR exercises

Monday, July 22nd
9-10 AM: The Birth and Maturation of the Molecular Dogma
10-11 AM: Guest Research Talk – TBD

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

Tuesday, July 23rd
9-10 AM: The Microbiome as an Ecosystem
10-11 AM: Guest Research Talk – TBD

**Lab:** Experiment 3 (Blood Typing): Part 4: Exon 7 gel electrophoresis, Analysis of Results from Exon 6 gels, Genetics of Blood Type Worksheet
**Wednesday, July 24th**
9-10 AM: Biomedical Research Ethics  
10-11 AM: Guest Research Talk – TBD

**Lab:** Experiment 3 (Blood Typing): Part 5 Blood Typing Results and Conclusions

**Thursday, July 25th**
9-11 AM STUDENT JOURNAL CLUB PRESENTATIONS*  
1-3 PM STUDENT JOURNAL CLUB PRESENTATIONS

**Friday, July 26th**
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.