

## Immunology Laboratory, Fall 2020

Lab Manual: Major portions of the Introduction; Exercises 1, 2, 4, 6, and 9, and the Appendix from Experimental Immunology, A Guidebook by Francis J. DeToma and A. Bruce MacDonald, portions of Exercise 3 from Jill Manske (University of St. Thomas). Available for downloading in Canvas.

### A. Grading and other valuable information

There are six labs to be done over the semester; all of which must be written up. Laboratory reports are due on the dates shown. The reports should be according to the instructions on pages 1-3 in your lab manual and may be written individually or as a pair. It will be assumed that if a report is submitted by a pair, both individuals worked equally on the report and deserve to receive the same grade (evidence against this assumption will result in a significant grade reduction). The class presentations of December 2<sup>nd</sup> and 9<sup>th</sup> will be done as a lab pair. It is worth 12 points. Each pair will present a recent paper from the literature that is a recent clinical trial in **humans** involving immunotherapy of an **autoimmune disease** or the immunotherapy of **cancer**. Each student must present two portions of the paper orally - for example, one person can do the introduction and the materials and methods; the second the results and, the discussion. The final 10 points will be given based on effort from your work throughout the semester. Twenty-five percent of the laboratory grade will be added to 75% of the average of the exam grades to arrive at the final grade in the course.

### B. Learning outcomes

Upon completion of this laboratory, students will:

1. Participate in the execution of the six required laboratories within a group of four students. They include:
  - a) Salting out of proteins and anion exchange chromatography, UV spectrophotometry to determine protein content
  - b) Immunodiffusion and Immunoelectrophoresis
  - c) Immunoprecipitation
  - d) Immunophenotyping
  - e) Passive Hemagglutination
  - f) Enzyme Immunoassay
2. Produce an abstract and written reports of laboratory exercises describing and discussing the results of the six labs
3. Gain experience with several modern immunological techniques and equipment.
4. Locate, summarize, and present the results of a published clinical trial using immunotherapy to treat human cancer or a human autoimmune disease.

C. Plagiarism (copying another student's lab report (**present or from previous years**) or copying published literature without citing it is a violation of College policy and will be reported.

D. Accommodations: SUNY Geneseo will make reasonable accommodations for persons with documented physical, emotional, or cognitive disabilities. Accommodations will be made for medical conditions related to pregnancy or parenting. Requests for accommodations including letters or review of existing accommodations should be directed to the Office of Disability Services in Erwin 22 (Ms. Amy Fisk in the Office of Disability Services ([disabilityservices@geneseo.edu](mailto:disabilityservices@geneseo.edu) or 585-245-5112)). Students with accommodation letters should contact their faculty members as early as possible in the semester to discuss specific arrangements. More information on the Office of Disability Services is available at [www.geneseo.edu/dean\\_office/disability\\_services](http://www.geneseo.edu/dean_office/disability_services).

<b>E. LABORATORY SCHEDULE</b>		
<b>Week #</b>	<b>Dates</b>	<b>Exercise</b>
1	September 2 (A then B)	Exercise 1 - Isolation of IgG from Rabbit Serum, Parts I and II
*2	September 9 (A then B)	Exercise 1 - Isolation of IgG from Rabbit Serum, Parts III and IV
*3	September 16 (A then B)	Exercise 4 - Analysis of Antigens by Immunodiffusion and Immunoelectrophoresis, requires returns at 24 and 48 hours; all samples can be soaked and finished on September 23
	<b>September 16</b>	<b>Lab Exercise 1 report due</b>
*4	September 23 (A then B)	Exercise 4 - finish staining and analyze Exercise 2 - The Quantitative Precipitation Assay, Part I
*5	September 30	No Lab, Rejuvenation Day
	<b>October 1</b>	<b>Lab Exercise 4 report due in class</b>
*6	October 7 (A then B)	Exercise 2, Part II
	<b>October 14</b>	<b>Lab Exercise 2 report due</b>
*7	October 14 (Groups 1 and 2)	Exercise 3, Immunophenotyping, sample preparation and running on the flow cytometer (Groups 1 and 2, Groups 3 and 4 case study)
*8	October 21 (Groups 3 and 4)	Exercise 3, Immunophenotyping, sample preparation and running on the flow cytometer (Groups 3 and 4, Groups 1 and 2 case study)
*9	October 28 (Groups 1 -4)	Exercise 3, Immunophenotyping, flow cytometry analysis Exercise 9- Enzyme Immunoassays, Part 1
*10	November 4 Groups 1 and 2	Exercise 9- Enzyme Immunoassays, Part 2 Groups 3 and 4 are off
	<b>November 4</b>	<b>Lab Exercise 3 report due</b>
*11	November 11 (Groups 3 and 4))	Exercise 9- Enzyme Immunoassays, Part 2 Groups 1 and 2 are off
	<b>November 18</b>	<b>Lab Exercise 9 report due</b>
12	November 18 (A then B)	Exercise 6- Passive Hemagglutination, Parts I-V, (Requires a return at 24 hours)
	<b>November 24</b>	<b>Lab Exercise 6 report due in class</b>
13	November 25	No Labs this week, Thanksgiving break
14	December 2	Class Presentation: Autoimmune diseases (Pair A) (all syn online)
15	December 9	Class Presentation: Cancer Immunotherapy (Pair B) (all syn online)

\*Search for a recent paper for the final presentations in the area of autoimmune diseases (pair A) and cancer immunotherapy (pair B), selection due by Nov. 11th