

Harvard Summer Program Immunology Project Resource Information Form	
Title	What's so great about a little Cell? Relating cell structure to function in the Immune System
Resource Type	<input type="checkbox"/> Lesson Plan <input checked="" type="checkbox"/> Activity <input type="checkbox"/> Lab Activity <input type="checkbox"/> Web-quest
Description	This activity focuses learning on cell structure and function in the immune system. Learning occurs through independent web research. Students will choose a cell in the immune system. After reviewing websites on the immune system, students apply their knowledge and critical thinking to address prompts around cell structure and function. This lesson could be used within a unit on: The cell, Anatomy and Physiology or Immunology
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Author Institution(s)	Francis W. Parker Charter Essential School
Objective	Students will: <ul style="list-style-type: none"> • Use internet resources to understand the way specific cells function in the immune system. • Create an annotated bibliography for resources used. • Apply knowledge to address connections around cell structure and function
Key Concepts	<ul style="list-style-type: none"> • Organelles structure and function • Structure of cell membrane • Diffusion, osmosis, active transport • Connections between cell structure and function • Variation of cells in the immune system
Student Prep	<ul style="list-style-type: none"> • Introduction to cell organelles • Introduction to membrane structure and transport across membranes • Annotated Bibliography format
Materials	Computers with Internet Access LCD computer projection (optional)
Grade level(s)	9 / 10 or Anatomy Physiology Elective

Teacher Prep Time	1-2 Hours
Class Time	Variable 2-5 Hours
National Standards	<p>Life Science CONTENT STANDARD C: As a result of their activities in grades 9-12, all students should develop understanding of * The cell Cells have particular structures that underlie their functions. Every cell is surrounded by a membrane that separates it from the outside world. Inside the cell is a concentrated mixture of thousands of different molecules which form a variety of specialized structures that carry out such cell functions as energy production, transport of molecules, waste disposal, synthesis of new molecules, and the storage of genetic material.</p>
State Standards	<p>CELLULAR: Broad Concept: All living things are composed of cells. Life processes in a cell are based on molecular interactions.</p> <ul style="list-style-type: none"> • Relate cell parts/organelles to their functions. • Differentiate between prokaryotic cells and eukaryotic cells, in terms of their general structures and degrees of complexity. • Explain the role of cell membranes as a highly selective barrier (diffusion, osmosis, and active transport). <p>ANATOMY: Broad Concept: There is a relationship between structure and function in organ systems of humans.</p>
Sources	None
References	Richard A. Goldsby, Thomas J Kindt, Barbara A Osborne, Janis Kuby. Cells of the immune system. In <i>Immunology</i> , 5 th ed., P. 25. WH Freeman and Co., New York
Assessment	<ol style="list-style-type: none"> 1. Immune Response Teams: Students are broken up into collaborative groups. Each student in the group is responsible for one cell type. After completing this activity, students teach their peers about their cell. In groups, or individually, students create story boards, cartoons or books that show their understanding of cell players in the immune system. 2. This lesson as it is can serve as an assessment. 3. Students can demonstrate their understanding by presenting their information in pamphlets, to an audience or integrated into a larger project on disease.