

## Harvard Summer Program Immunology Project Resource Information Form

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| <b>Title</b>                 | <b>Immunology Concept Map: Making Connections</b>  |
| <b>Resource Type</b>         | Activity   |
| <b>Description</b>           | Making connections is a way to evaluate the degree to which we understand. Immunology involves both three dimensional structures as well as motion, which are probably best explained through analysis of animations and images. Use the PowerPoint template to produce a “website” which links the basic concept map contents contained therein to the images that best augment them.   |
| <b>Author(s)</b>             | John S. Wemple   |
| <b>Author Institution(s)</b> | Moses Brown School   |
| <b>Objective</b>             | To associate detailed images/animations with the correct step in the immune response   |
| <b>Key Concepts</b>          | Cellular Immunity<br>Humoral Immunity  |
| <b>Student Prep</b>          | An overview of specific immunity and allergies is required before performing this activity. In addition, familiarity with PowerPoint/Text Boxes/Hyperlink is also necessary  |
| <b>Electronic Materials</b>  | Teacher PowerPoint Template – TeacherImmunologyProject.ppt (An example of the finished product)<br>Student PowerPoint Template – StudentTemplate.ppt (The unlinked but already structured PowerPoint Presentation)<br>WebSite Links List – ConnectionsAssignment.doc   |
| <b>Grade level(s)</b>        | 11 + 12 AP Biology or Anatomy/Physiology   |
| <b>Teacher Prep Time</b>     | None, if you are already able to create text boxes and hyperlinks from those text boxes in PowerPoint. Otherwise, 20 minutes are all that are needed to become comfortable with that particular computer skill   |
| <b>Class Time</b>            | 4 Days   |
| <b>National Standards</b>    | <b>UNIFYING CONCEPTS AND PROCESSES STANDARD</b><br>Evidence, models, and explanation<br>Form and function.<br><b>SCIENCE AS INQUIRY STANDARDS</b><br>An appreciation of "how we know" what we know in science.<br><b>SCIENCE AND TECHNOLOGY STANDARDS</b><br>The science and technology standards in Table 6.5 establish connections between the natural and designed worlds and provide students with opportunities to develop decision-making abilities. They are not standards for technology education; rather, these standards emphasize abilities associated with the process of design and fundamental understandings about the enterprise of science and its various linkages with technology. |

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|   | <p><b>ASSESSMENT STANDARD B:</b><br/>The ability to communicate effectively about science.</p>   |
| <p>State Standards for Rhode Island</p> | <p><b>Heredity</b><br/><i>Some new gene combinations make little difference, some can produce organisms with new and perhaps enhanced capabilities, and some can be deleterious.</i></p> <p><b>Cells</b><br/><i>Every cell is covered by a membrane that controls what can enter and leave the cell. In all but quite primitive cells, a complex network of proteins provides organization and shape and, for animal cells, movement.</i></p> <p><b>Cells</b><br/><i>The work of the cell is carried out by the many different types of molecules it assembles, mostly proteins. Protein molecules are long, usually folded chains made from 20 different kinds of amino-acid molecules. The function of each protein molecule depends on its specific sequence of amino acids and the shape the chain takes is a consequence of attractions between the amino acids in the chain.</i></p> <p><b>Physical Health</b><br/><i>Some viral diseases, such as AIDS, destroy critical cells of the immune system, leaving the body unable to deal with multiple infection agents and cancerous cells.</i></p>  |
| <p>Sources</p>                          | <p>None, completely original</p>   |
| <p>References</p>                       | <p><a href="http://www.slic2.wsu.edu:82/hurlbert/micro101/images/Em10a.gif">http://www.slic2.wsu.edu:82/hurlbert/micro101/images/Em10a.gif</a><br/> <a href="http://www.slic2.wsu.edu:82/hurlbert/micro101/images/101PhageLife.gif">http://www.slic2.wsu.edu:82/hurlbert/micro101/images/101PhageLife.gif</a><br/> <a href="http://gslc.genetics.utah.edu/units/basics/transcribe/">http://gslc.genetics.utah.edu/units/basics/transcribe/</a><br/> <a href="http://www.slic2.wsu.edu:82/hurlbert/micro101/images/101VirusBudding.gif">http://www.slic2.wsu.edu:82/hurlbert/micro101/images/101VirusBudding.gif</a><br/> <a href="http://www.nature.com/nrm/journal/v2/n3/animation/nrm0301_179a.swf">http://www.nature.com/nrm/journal/v2/n3/animation/nrm0301_179a.swf</a> MEDIA1.htm<br/> <a href="http://www.dukecancervaccines.org/latestflash.htm">http://www.dukecancervaccines.org/latestflash.htm</a><br/> <a href="http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/C/ClassIpath.gif">http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/C/ClassIpath.gif</a><br/> <a href="http://science.nhmccd.edu/biol/inflam.html">http://science.nhmccd.edu/biol/inflam.html</a><br/> <a href="http://www.humphath.com/IMG/jpg/perforin_action.jpg">http://www.humphath.com/IMG/jpg/perforin_action.jpg</a><br/> <a href="http://www.cat.cc.md.us/courses/bio141/lecguide/unit3/viruses/ctlapop.html">http://www.cat.cc.md.us/courses/bio141/lecguide/unit3/viruses/ctlapop.html</a><br/> <a href="http://www.cat.cc.md.us/courses/bio141/lecguide/unit3/intro/t8cell/apcs/apc.html">http://www.cat.cc.md.us/courses/bio141/lecguide/unit3/intro/t8cell/apcs/apc.html</a><br/> <a href="http://www.cellsalive.com/qtmovs/mac_mov.htm">http://www.cellsalive.com/qtmovs/mac_mov.htm</a><br/> <a href="http://www.bio.davidson.edu/courses/Immunology/Flash/MHCII.html">http://www.bio.davidson.edu/courses/Immunology/Flash/MHCII.html</a><br/> <a href="http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/C/ClassIIpath.gif">http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/C/ClassIIpath.gif</a><br/> <a href="http://science.nhmccd.edu/biol/inflam.html">http://science.nhmccd.edu/biol/inflam.html</a><br/> <a href="http://www.people.virginia.edu/~rjh9u/abrsp1.html">http://www.people.virginia.edu/~rjh9u/abrsp1.html</a><br/> <a href="http://www.whfreeman.com/kuby/content/anm/kb06an01.htm">http://www.whfreeman.com/kuby/content/anm/kb06an01.htm</a><br/> <a href="http://www.accessexcellence.org/AB/GG/antiBInfect.html">http://www.accessexcellence.org/AB/GG/antiBInfect.html</a><br/> <a href="http://www.cat.cc.md.us/courses/bio141/lecguide/unit2/innate/antibody/phagsum.html">http://www.cat.cc.md.us/courses/bio141/lecguide/unit2/innate/antibody/phagsum.html</a><br/> <a href="http://www-biology.ucsd.edu/classes/bimm124/fixation.mov">http://www-biology.ucsd.edu/classes/bimm124/fixation.mov</a></p> |
| <p>Assessment</p>                       | <p>This activity is an assessment. Correct linkage between the various segments of the immune system and the corresponding image/animation</p>   |

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