### It's in the Water: Waterborne Infections
**University Honors Course (BIOL3081)**  
Fall Semester, 2014  
**TENTATIVE SYLLABUS**


<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>W27</td>
<td>Symbiosis (phoresis, commensalism, mutualism, parasitism); reproductive strategies (“r” “k”). [Kaneshiro]</td>
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<td>F29</td>
<td>Epidemics/epidemiology – definitions (outbreak, epidemic, pandemic; prevalence, incidence, virulence); Basic reproductive ratio ($R_0$; multiplier of disease; spread of epidemic); herd immunity. [Kaneshiro]</td>
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<td>Sept M1</td>
<td>Epidemiology – social media for detecting possible gastrointestinal infection Outbreaks; organization, instructions (geotags, who, what where, when, why, how), how data will be verified for quality and exclude hoaxes. How to compare what students are finding with CDC reports (check to see if all students know how to check CDC website) – [Keely] Updates/progress on how this project is progressing will be discussed at several subsequent sessions.</td>
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| W 3   | Hydrologic cycle: Where is this water coming from?  
|       | Individual environmental water sampling (tapwater, shower, other “gray water”, cisterns, roof catchments, wells, etc.)  
|       | Students collect water samples on their own (we will provide standard collection containers and instructions on collection protocols, recording data and storage– [Buffam, Keely] |
| F 5   | What determines the quality of water? Water chemistry – nutrient contamination levels. [Buffam]                                                                                                     |
| M 8   | Water analysis – chemical, biological – [Buffam, Keely, Villegas]                                                                                                                                       |
| W 10  | ORSANCO, Confluence Regional Water Technical Development effort Safe water; clean water acts) [Ball, Vicory]                                                                                          |
| F 12  | Field Trip – ORSANCO – kits to analyze water collected by individual students [Tennant]                                                                                                                 |
M15 Viruses – Biology of viruses; what viruses are in water- [Jiang, Quigley]

Reports on individual samples taken by each student results on water chemistry performed in the lab and results of analyses performed at ORSANCO due.

W17 Noroviruses (epidemiology) [Jiang, Quigley]
Update, reports by students on epidemiology via social media or other personal communications methods if any possible outbreaks detected and potential actions. More contacts/questionaire needed? Are we detecting what CDC is reporting [Keely]

F19 Viruses – vaccines – [Jiang, Quigley]

M22 Viruses – lab procedures; demonstrations–[Jiang, Quigley]

W24 Viruses - hepatitis A and E. [Shata]

F26 Field Trip - GCWW Miller Plant – [Swertfeger]

M29 Update, reports and discussion by students on epidemiology via social media or other personal communications methods if any possible outbreaks detected and potential actions. [Keely]

Oct W 1 Bacteria – Organize research groups on the history of the Cincinnati cholera epidemic (Europe/Ireland potato famine, Great Lakes, St. Lawrence River, Ohio River, Sandusky, OH); who, how many became ill, died; buried in Spring Grove Cemetery and Sandusky cholera cemetery; Mt Pleasant/Mt Healthy) - each group will prepare a comprehensive report and groups will make a class presentation of different parts or aspects of the epidemic. [Kaneshiro]

F3 Cincinnati Cholera Epidemic – Field trip to Spring Grove Cemetery [Kaneshiro]

M6 FALL READING DAY???

W 8 Students organize Cincinnati Cholera Epidemic reports – assignments into groups according to topics

F10 Bacteria – fecal coliforms – [Villegas]

M13 Bacteria – coliforms: instructions, analyses Enterics lab procedures – [Villegas; Stacey]

W15 Bacteria – enterics lab procedures, analytical results and interpretations; discussions [Villegas, Stacey]
F17  Field Trip – Metropolitan Sewer District, Dalton Street – [Swertfeger]
M 20  Immune System [Villegas]
W22  Immune System [Villegas]
F24  Host response to gastrointestinal pathogens [Villegas]
M27  Midterm Exam
W29  Bacterial Pathogens in Water and their detection by state-of-art approaches [Villegas].
Ecological methods for detecting bacteria and viruses in water: exposure to nextgen sequencing [Keely]
Update, reports by students on epidemiology via social media or other personal communications methods if any possible outbreaks detected and potential actions. [Keely]
F31  Eukaryotic Pathogens: Giardia, Cryptosporidium [Villegas, Kaneshiro]

Nov  M  3  USEPA detection of Cryptosporidium & Giardia – Method 1623: lab – [Villegas, Stacy]
W5   Follow up on Method 1623 immunofluorescence results and discussion [Villegas]
F7   Naegleria, Acanthamoeba and Legionella [Kaneshiro, Villegas]
M10  Toxoplasma and transmission to otters, behavioral changes of hosts [Villegas]
W12  Reports on Cincinnati Cholera Epidemic Research due – one full report from each group with presentations of different aspects by different study groups (oral with power point illustrations) [Kaneshiro]
F14  Algae (Microcystis/microcystin toxin; odor, taste) [Shann]
M17  Marine toxins [Otten]
W19  Follow up on communications methods if any possible outbreaks detected and potential actions [Keely]
F21  Field Trip to GCWW – Bolton Plant: groundwater from the Miami Aquifer [Swertfeger]
M 24  Field trip – USEPA – What is done at this federal agency about water safety? [Villegas] Next-gen sequencing [Keely]

W26  Prepare, organize final collection of data on epidemiology via social media. [Keely]

F28  Thanksgiving Holiday - UC closed

Dec  M 1  Student Groups Work on final reports of epidemiology study via social Networking [Keely]

W3  Class presentations on epidemiology by social networking [Keely]

F5  Organize final report on epidemiology project – [Keely, Villegas, Kaneshiro]

Final Exam week: 2nd Midterm – (material since 1st midterm exam: eukaryotic pathogens)

- For hands-on classes: meet in one of the 6th floor microbiology teaching labs (Julie Stacey in charge)
Fall 2014 Honors Course: “It’s in the Water: Waterborne Diseases”
Contact information: Partial List of Proposed Participants

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