

Major Assignments and Rubrics, BIOL4125 Spring 2018

Around the tree. Each day two students will give an individual three minute (max!) presentation on a microorganism from The List, below. You will turn in written summary, including any images you would like to use, all properly cited, in **a single .pdf document**. You will also submit a summary tweet with a link to a relevant publication and #biol4125. Describe the following and/or use diagrams/pictures:

1. Scientific name, including strain
2. Etiology of the name
3. Current classification on the Tree of Life (Domain, Phylum, etc...), and placement on our trees
4. Any previous/more current classifications
5. How it was isolated/by whom
6. Size
7. Shape
8. Membrane
9. Motility
10. Metabolism (see Metabolism in A Nutshell)
11. List of e- acceptors
12. List of e- donors
13. Growth optima (temp/pH/salinity/pressure)
14. Genome size
15. GC content
16. Number of genes/protein coding genes
17. Habitat (location, free-living/host-associated)
18. Pathogenic?
19. If so, how do we treat it?
20. Who gives a damn (why should we care about this bug/why do you think it's on The List, below)?

Grading will be as follows: one point each for 1-19, 3 points for 20 (comprehensiveness), 3 points for your presentation (clear, organized, within the 3 minute time frame). You must cite primary literature in your presentation and written summary. To help you find appropriate sources, the following resources may be helpful:

- Primary literature (naming papers, discovery papers, genome sequencing papers)
- Bergey's Manual of Systematic Microbiology (see Moodle and the library)
- The Prokaryotes (see Moodle and the library)
- IMG (<http://img.jgi.doe.gov/cgi-bin/w/main.cgi>)
- Wikipedia, Microbewiki
- Brock Biology of Microorganisms
- LPSN (<http://www.bacterio.net>)

The List (of some important Bacteria and Archaea):

1. *Candidatus Pelagibacter ubique* HTCC1062
2. *Shewanella oneidensis* MR-1
3. *Magnetospirillum magnetotacticum* MS-1
4. *Deinococcus radiodurans* ATCC BAA-816
5. *Geobacter metallireducens* GS-15
6. *Desulfovibrio vulgaris* Hildenborough
7. *Methanocaldococcus jannaschii* DSM 2661
8. *Yersinia pestis* KIM 10
9. *Trichodesmium erythraeum* IMS101
10. *Myxococcus xanthus* DK 1622
11. *Nitrosopumilus maritimus* SCM1
12. *Nanoarchaea equitans* Kin4-M
13. *Thermatoga maritima* MSB8
14. *Thermococcus barophilus* MP
15. *Halobacterium salinarum* R1
16. *Escherichia coli* K12
17. *Cenarchaeum symbiosum* A
18. *Staphylococcus aureus* ST1:USA400
19. *Borrelia burgdorferi* B31
20. *Haemophilus influenzae* Rd
21. *Desulfobulbus* spp. "Cable bacteria"
22. *Ralstonia eutropha* H16
23. Division TM7 strain TM7x
24. *Candidatus Sulcia muelleri*
25. *Liberibacter crescens* BT-1
26. *Chlorobium limicola*
27. *Chloroflexus aurantiacus*
28. *Dictyoglomus turgidum* DSM 6724
29. *Thermaerovibrio acidaminovorans* Su883
30. *Candidatus Entotheonella* sp. TSY1
31. *Cloacibacillus evryensis* 158
32. *Thermodesulfobacterium commune*
33. *Parcubacteria bacterium* SCGC AAA255-P19
34. *Nitrospina gracilis* 3/211
35. *Microgenomates bacterium* SCGC AAA011-E14
36. *Candidatus Korarchaeum cryptofilum* OPF8
37. *Candidatus Nitrospira nitrosa*
38. *Candidatus Fonsibacter ubiquis*
39. *Candidatus Omninitrophus fodinae* SCGC AAA011-A17
40. *Mycoplasma genitalium* G37
41. *Mycobacterium tuberculosis* H37Rv
42. *Rickettsia prowazekii* Madrid E
43. *Aquifex aeolicus* VF5
44. *Acidobacterium capsulatum* ATCC 51196
45. *Alivibrio fischeri* ES114
46. *Vibrio cholerae* O1 bv El Tor
47. *Candidatus Methylospirillum oxyfera*
48. *Bacteroides vulgatus* ATCC 8482
49. *Chlamydia trachomatis* serovar D
50. *Thermus aquaticus*
51. *Lentisphaera araneosa* HTCC2155
52. *Candidatus Kuenenia stuttgartiensis*

53. *Verrucomicrobium spinosum* DSM 4136
54. *Fusobacterium nucleatum* ATCC 25586
55. *Dechloromonas aromatica* RCB
56. *Lactobacillus acidophilus* NCFM
57. *Bacillus subtilis subtilis* 168
58. *Prochlorococcus marinus* CCMP-1375

59. *Gemmatimonas aurantiaca* T-27T
60. *Rhizobium leguminosarum* bv trifolii WSM23
61. *Burkholderia pseudomallei*
62. *Lokiarchaeum* sp. GC14_75

Wikipedia Project. During the course of the semester, you will have a major project that involves building a Wikipedia Page from scratch detailing a microorganism that does not already have an entry. First, you will write a proposal that details your planned Wikipedia page and allows you to generate a plan of attack. Then you will move into creating the Wikipedia Page proper. You will be assigned to groups of 3-4 that incorporate as much diversity and gender balance as possible. I am assigning groups, instead of letting you pick your own, to provide you with the opportunity to practice the most valuable skills in any private sector, academic, governmental, or service job: communication, teamwork, and conflict resolution. Get to know each other, stay positive and solution-minded, and pull your weight. The project is designed to be too work-intensive to be completed alone, so you will be responsible for overcoming any difficulties that arise within your group as a key training aspect of the project. Since for many of you this is the last semester before beginning post-graduate education and/or the workforce, this is an excellent time to practice executing large team-oriented work that you will commonly face.

Wikipedia Proposal. As a group, you will prepare a proposal for your Wikipedia Page on a specific bacterial or archaeal species for which either no entry currently exists (including Microbewiki), or exists only as a “stub.” Your group will be responsible for scouring the internets using at least Wikipedia AND Google to determine this. Examples of stub entries for prokaryotes can be found by searching “Category:bacteria stubs” or “Category:archaea stubs” in the search box on Wikipedia. NOTE, your organism needs to also have been cultivated, with some physiological description AND a sequenced genome. Look at the requirements for your Wikipedia page (see rubric below the proposal rubric) and **make sure to pick an organism that will allow you to complete the Wikipedia page as required.** The proposal will be peer-reviewed according to the rubric below. Submit a maximum of three text pages (single-spaced, 10pt Times New Roman font, all margins 1”) with one additional page for references. After you receive your reviews, you will be responsible for editing your proposals to address these concerns and turning in final versions according to the schedule. Only the final versions will count towards your grade, and points will be awarded for completing peer review as well. IMPORTANT- if you fail to turn in a first draft, you will be ineligible to participate in peer review and therefore forfeit those points.

First draft due: **February 20th**

Final draft due: **March 15th**

Wikipedia proposal rubric- total points available: 150 (15% of your grade)

Criterion	Non existent	Beginning	Emerging	Exemplary
Taxonomic and phylogenetic description of the organism	Information not included in proposal. (0 points)	Incomplete taxonomic details with little or no phylogenetic information. (4 points)	Statement of taxonomic details without complete description of phylogenetic relationship between taxa. (7 points)	Complete taxonomic details for the organism, including relevant phylogenetic information regarding near neighbors (10 points)
Describe the discovery of the organism- by whom, how, and when?	Information not included in proposal. (0 points)	Incomplete or partially missing description of the required elements (10 points)	Complete description of one or two, but not all, elements (15 points)	Complete description of the discovery process, including the researchers, their methods, and timing. (20 points)
Preliminary characterization	Information not included in	Cursory or incomplete description of all	Partial description of the required elements,	Preliminary description of what is currently known about

	proposal. (0 points)	required elements. (10 points)	or full description of some with certain key elements left out. (15 points)	the metabolism, genomics, and ecology of the organism (20 points)
Vetting process to determine organism is not documented elsewhere	Information not included in proposal (0 points)	Few search terms (< 3), only completed using one search engine, poor documentation (4 points)	Good number of search terms (≥ 3), two search engines, partially documented (7 points)	Table documenting results from ≥ 5 search terms with ≥ 3 search engines (10 points)
List of sections for your final page, personnel assignments, and timeline	Information not included in proposal (0 points)	Missing more than 2 elements (4 points)	Missing 1-2 elements, such as sections, people assigned, or timing. (7 points)	A list of sections you will have in your entry, along with a timeline showing who will be responsible for what parts of the project and when each section will be completed. (10 points)
WGAD?!!	Information not included in proposal. (0 points)	Poorly or unclearly stated argument for outside interest. (10 points)	Clearly stated but insufficiently justified argument for outside interest. (15 points)	Clearly stated and well- justified argument for why people outside of the field should care about this organism. (20 points)
Correct spelling and grammar	More than ten spelling and/or grammar mistakes. (0 points)	Seven to ten spelling and/or grammar mistakes. (10 points)	Between three and six spelling and/or grammar mistakes. (15 points)	Two or fewer spelling and/or grammar mistakes. (20 points)
Organized and logically structured.	Verbal vomit. (0 points)	Poorly organized, little or no use of topic sentences and transitions. (4 points)	Inconsistent use of topic sentences and transition statements, but clearly organized. (7 points)	Topic sentences for each paragraph, logical order among the paragraphs, transition statements, and informative subheadings. (10 points)
Fully referenced using primary literature	No primary literature references. (0 points)	More than five instances of missing or inappropriate references (e.g., a wikipedia page). (10 points)	One to five instances of missing or inappropriate references (e.g., a wikipedia page). (15 points)	All statements of fact or even previously stated opinions are recognized and accurately reported citing relevant primary literature. (20 points)
All topic-specific terms defined	More than ten instances of undefined jargon, acronyms, or unusual terms. (0 points)	Six to ten instances of undefined jargon, acronyms, or unusual terms. (4 points).	One to five instances of undefined jargon, acronyms, or unusual terms. (7 points)	Jargon is avoided, all topic- specific, unusual terms and acronyms are well-defined. (10 points)

Wikipedia Page. You will be building your Wikipedia page in the same groups organized for your proposal. The Page involves many of the same elements in your proposal, but requires much more extensive development of content. You will need to divide and conquer. You will meet with Dr. Becky Carmichael, the LSU Wikipedia Ambassador, on how to correctly build Wikipedia entries, including how to handle stubs vs. novel entries, and proper use of the "Sandbox." Your entry will also be subjected to a draft-feedback-revision cycle, with your final product will be graded according to the rubric below. After final revisions, you will be approved to make the page live, and this final product will be presented to the class during the final week of the course. Work on the Wikipedia site, **including in your sandbox**, is subject to strict anti-plagiarism rules. Volunteer editors (Wikipedians) routinely patrol all entries to identify malpractice. If at any time you fail to adhere to these rules, you will be disqualified from completing the assignment and receive a zero. For guidance, see <https://www.youtube.com/watch?v=Kb11rqRVq7c>.

First draft due: **April 10th**
Final draft due: **April 24th**

Wikipedia page rubric- total points available: 250 (25% of your grade)

Criterion	Non existent	Beginning	Emerging	Exemplary
Organization and structure	No subheadings, no taxonomy box. (0 points)	Poorly organized, little or no use of subheadings, and/or no taxonomy box (4 points)	Well organized, including some but not all of: a lede, taxonomy box, and subheadings. (7 points)	Fully structured entry, including a lede, taxonomy box, subheadings, table of contents. (10 points)
Taxonomic and phylogenetic description of the organism	Information not included. (0 points)	Incomplete taxonomic details with little or no phylogenetic information. (4 points)	Statement of taxonomic details without complete description of phylogenetic relationship between taxa. (7 points)	Complete taxonomic details for the organism, including relevant phylogenetic information regarding near neighbors (10 points)
Describe the discovery of the organism- by whom, how, and when?	Information not included. (0 points)	Incomplete or partially missing description of the required elements (10 points)	Complete description of one or two, but not all, elements (15 points)	Complete description of the discovery process, including the researchers, their methods, and timing. (20 points)
Physiological characterization	Information not included. (0 points)	Cursory or incomplete description of all required elements. (10 points)	Partial description of the required elements, or full description of some with certain key elements left out. (20 points)	Comprehensive description of what is currently known about growth rates; temperature, salinity, and pH optima and ranges; other growth conditions, including media, and techniques used to measure these capabilities. (30 points)
Genomics and metabolic reconstruction	Information not included. (0 points)	Cursory or incomplete description of all required elements. (15 points)	Partial description of the required elements, or full description of some with certain key elements left out. (25 points)	Comprehensive description of the genome sequencing methodology, assembly and annotation techniques, genome statistics (size, GC content, # genes, etc.), and a catalog of metabolic potential based on KEGG. (40 points)
Ecology	Information not included. (0 points)	Poor description of both elements, or modest reporting of one and missing of the other. (10 points)	Good description of the distribution or techniques, but poor description of the other element, or partial reporting of both. (20 points)	Comprehensive description of the spatio-temporal distribution of this organism, and a description of how it was measured (16S rRNA gene amplicons, metagenomics, nanoSIMS, etc.) (30 points)
WGAD?!!	Information not included. (0 points)	Poorly or unclearly stated argument for outside interest. (10 points)	Clearly stated but insufficiently justified argument for outside interest. (15 points)	Clearly stated and well-justified argument for why people outside of the field should care about this organism, including involvement in applied science and/or medicine, any other relevant information (20 points)
Respecting the Wikipedia standards	Highly opinionated, argumentative tone, no regard for Wikipedia standards. (0 points)	More than 3 instances of argumentation/opinions without attribution or balance. (4 points)	One to 3 instances of argumentation or opinions without attribution or balance. (7 points)	Article is written from a neutral point of view, balanced description of both sides to any controversy, aimed at a high-school level. (10 points)
Internal and external links	No links included. (0 points)	More than five instances of missing or ineffective links. (10 points)	One to five instances of missing or ineffective links. (15 points)	All possible reference points to outside and other Wikipedia webpages are effectively linked. (20 points)
Fully referenced using primary literature	No primary literature references.	More than five instances of missing or inappropriate	One to five instances of missing or inappropriate	All statements of fact or even previously stated opinions are recognized and accurately

	(0 points)	references. (10 points)	references. (20 points)	reported citing relevant primary literature. (30 points)
Correct spelling and grammar	More than ten spelling and/or grammar mistakes. (0 points)	Seven to ten spelling and/or grammar mistakes. (10 points)	Between three and six spelling and/or grammar mistakes. (15 points)	Two or fewer spelling and/or grammar mistakes. (20 points)
All topic-specific terms defined	More than ten instances of undefined jargon, acronyms, or unusual terms. (0 points)	Six to ten instances of undefined jargon, acronyms, or unusual terms. (4 points)	One to five instances of undefined jargon, acronyms, or unusual terms. (7 points)	Jargon is avoided, all topic-specific, unusual terms and acronyms are well-defined. (10 points)
Legal	Any instances of plagiarism/significant paraphrasing, inappropriate image use WILL RESULT IN AN INCOMPLETE FOR THIS PROJECT and NO CREDIT, as well as ACADEMIC ACTION.			Complete adherence to Wikipedia copyright and plagiarism rules at all times, INCLUDING IN YOUR SANDBOX.

Peer review. Both the Wikipedia proposal and the Wikipedia page will undergo a draft-feedback-revision cycle via peer-review. Each person will peer-review two different proposal and two different Wikipedia entry drafts, and thus each proposal and entry draft will receive two reviews. Peer review will be completed by students only, but I will be grading your peer review efforts according to the rubric below.

Two proposal peer reviews due: **March 6th**
Two Wikipedia page peer reviews due: **April 17th**

Peer review rubric- total points available: 25 x 4 reviews = 100 (10% of your grade)

Criterion	Non existent	Beginning	Emerging	Exemplary
Use of the writing rubric for grading	Doesn't use rubric at all (0 points)	Missing explicit assignment of quality level in more than 2 categories (1 point)	Missing explicit assignment of quality level for 1-2 rubric categories (3 points)	Provides an explicit assignment of quality level for every rubric category (5 points)
Provides specific commentary for elements without full credit	No commentary at all (0 points)	More than 3 instances of no specific commentary for why that credit level was chosen, and/or poor/ambiguous commentary (4 points)	1-3 instances of categories without full credit lacking specific reasoning for why that credit level was chosen (7 points)	Each category without full credit receives specific reasoning for why that credit level was chosen (10 points)
Provides constructive criticism for improving the paper	No constructive criticism (0 points)	Ambiguous or poorly conceived criticism with little logic. (4 points)	Good effort at providing constructive criticism but with specificity lacking (7 points)	Clearly stated, thoughtful, and specific suggestions for how to improve the paper (10 points)