

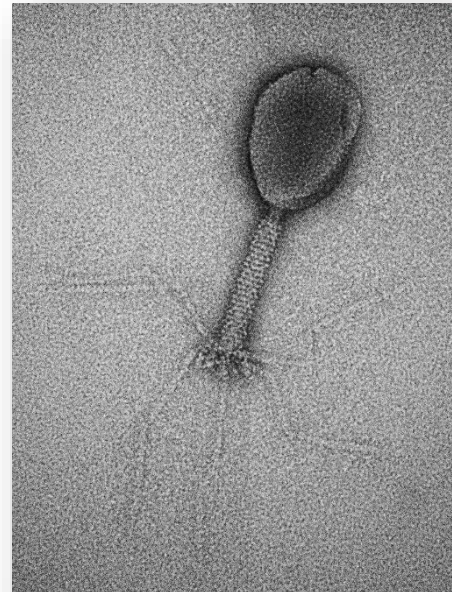
For FALL 2021: Biology 498. 1 cr

. TEM Workshop: "Using Transmission Electron Microscopy to Image Viruses & Bacteria."

In-Person class sessions: Friday-Sunday, 15-17 October 2021



UWSP's Hitachi H-7500 Transmission Electron Microscope



A T2 bacteriophage, with viral DNA still in its capsid, at 300,000X magnification, showing sheath protein subunits and tail fibers.

Instructor: Sol Sepsenwol, Ph.D., Emeritus Professor of Biology, CBB326, ext. 4394. **Format:** Online: Friday-Thursday, October 8-14. Videos (asynchronous) on techniques and microscope basics. In-person (all class): Friday-Saturday, October 15-16. Preparation of samples, class tutorial on operation of microscope. In-person tutorials (1/student): scheduled in 4-hour blocks during Sunday-Thursday, October 17-21. One evening ZOOM class presentation of slides, scheduled sometime during week of November 1-5. Limit: 6 students*. Prerequisites: Biology 160 & 130 or 110 & 111 and one other upper-level science course with a lab; students with Biol 333 (Microbiology), Biol 319 (Molecular Biology), Biol 314 (Cell Biology), Biol 428 (SEM Workshop) or Chem 365 (Biochemistry) will be given preference. Consent of instructor (ssepsenw@uwsp.edu)

Description: Our Hitachi H-7500 transmission electron microscope (TEM) was installed at the UWSP in 2018. It can create clear images at over 600,000X magnification. This is more than 400 times higher than the best light microscope -- good enough to see individual molecular structures in viruses and bacteria. In this Workshop, students will learn how to prepare viruses and bacteria for TEM using a rapid technique called *negative staining*. Students will learn how to use the TEM and its digital camera system to look at their own preparations, as well as plastic-embedded sections of mouse tissues prepared by the instructor. Following training sessions, the class will break up into 2-person tutorial teams to practice their TEM and camera skills on their own preparations. After this Workshop, students will have the option of using their training to pursue research projects with other Biology faculty members.

* May be increased to 10 depending on Covid conditions.

TENTATIVE WORKSHOP SCHEDULE

Online (asynchronous) : Friday-Thursday, October 8-14: short videos on transmission electron microscope "anatomy", glow-discharging grids, negative staining of viruses and bacteria, basic scope operation. **In-person, EM lab, CBB326: Friday, October 15 @ 1-6 pm and Saturday, October 16 @ 9am - 5 pm:** glow-discharging carbon-coated grids for the TEM; negative staining of viral and bacterial suspensions. Demo of tissue ultra-thin sectioning for TEM. Class training in the alignment and use of the Hitachi TEM, training in the use of the AMT digital capture system. Creating **Photo Albums** in PowerPoint of TEM images for class presentation; creating explanatory slides. Sign-ups for tutorials; scheduling the class presentation. **In-person, EM lab, CBB326: Sunday -Thursday, October 17-21:** 4-hour team tutorials (2 students, 2 hrs ea student) with student-prepared material and sectioned material. **In-Person or synchronous Zoom class presentation (depending on prevailing Covid conditions):** TBS during the week of November 1-5: one evening presentation by Workshop students. Afterwards, some Biology faculty may offer brief descriptions of their research projects that involve TEM that students might be interested in. **Covid precautions (masks, gloves & sanitation) will be observed.**