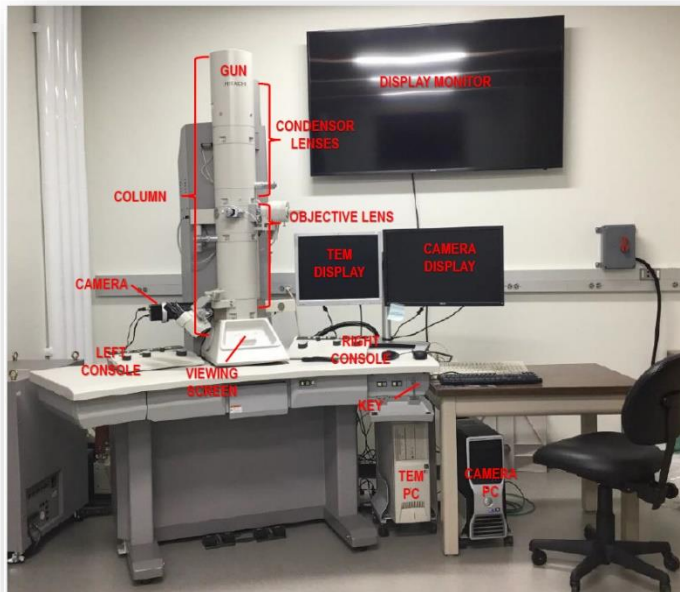
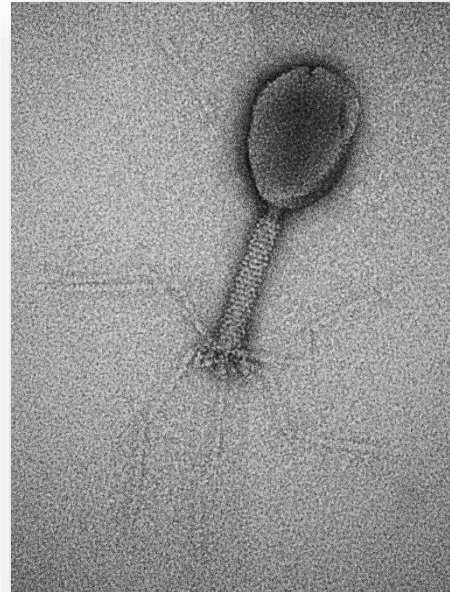


SYLLABUS FOR TEM WORKSHOP
Friday-Saturday, 2-4 APRIL 2021 (In Person)

Title: Biology 498. 1 cr. TEM Workshop: "Using Transmission Electron Microscopy to Image Viruses & Bacteria."



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, March 26- April 1:** videos (asynchronous) on techniques and microscope basics. **In-person (all class): Friday-Saturday, April 2-April 3:** preparation of samples, class tutorial on operation of microscope. **In-person tutorials (1/student):** scheduled in 4-hour blocks during **Sunday-Thursday, 4-8 April. One evening ZOOM class presentation** of slides, scheduled during week of **April 12-16. Limit:** 6 students. **Prerequisites:** Biology 160 & 130 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 mammalian tissue sections 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.

TENTATIVE WORKSHOP SCHEDULE

Online (asynchronous) : Friday-Thursday, March 26- April 1: short videos on transmission electron microscope "anatomy", glow-discharging grids, negative staining of viruses and bacteria, basic scope operation. **In-person: Friday, April 2 @ 1-6 pm:** glow-discharging carbon-coated grids for the TEM; negative staining of viral and bacterial suspensions. Demos of tissue sectioning for TEM. **Saturday, April 3 @ 9am - 5 pm:** 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. **Sunday -Thursday, April 4-8:** 4-hour team tutorials (2 students, 2 hrs ea student) with student-prepared material and sectioned material. **Class presentation:** TBS during the week of April 12-16: 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 strictly observed.**