

On November 16th, the Nanotechnology Club at Northwest Vista College toured the DPT Brooks R&D facility at 3300 Research Plaza in San Antonio. The tour started in the facility's conference room where the regulatory affairs director, Ms. Harrell, provided an overview of DPT's activities. The company offers comprehensive research and development services focused on liquid and semi-solid formulations, including aerosols, foams, lotions, creams, gels, and ointments. DPT's services range from the pre-formulation stage, through formulation, regulatory compliance, manufacturing scale-up, and packaging, to post-marketing safety and quality assurance. Since post-graduate job prospects in the San Antonio area are of interest to the club members, Ms. Harrell reported that DPT employs about 800 people in San Antonio in jobs encompassing the entire range of pharmaceutical research and production activities. The company prefers to hire locally, and has offered paid summer internships for students interested in pursuing a career in the pharmaceutical industry.

Following the introduction, safety glasses were handed out, and the group began the laboratory tour at the pre-formulation area. This laboratory deals with the basic level of services such as raw material sourcing, solubility profiling, compatibility testing of active drug ingredients with various inactive ingredients, stability testing, and product characterization. The group was introduced to some of the equipment used for these activities, such as the laser diffraction particle sizing instrument, the optical microscope, the viscometer, and the FTIR spectrometer. The next stop on the tour was the analytical laboratory, which focuses on method development and assessment and validation for small molecules and biomolecules. This laboratory uses wet chemistry in addition to the latest instrumentation for UV-Vis and IR spectroscopy, Franz cell diffusion studies, and gas (GC) and liquid (LC) chromatography and mass spectroscopy (MS), including HPLC, UPLC, and GC/MS. Since many of the products tested in the laboratory are somewhat fragile, HPLC and UPLC account for approximately 90% of the separation activities. The final laboratory the group visited deals with formulation services, where active ingredients are combined with carriers to create finished products such as aerosols, foams, lotions, creams, gels, and ointments. Much of the activity involves milling, mixing, and homogenization in order to get the right particle or droplet sizes and formulation adjustments to insure the correct viscosity, pH, and specific gravity. In

addition to mills, mixers, and homogenizers, this laboratory contains sealed artificial environments to test product stability over a range of temperatures and humidity.

At the conclusion of the tour, the club members expressed interest in DPT's services to the pharmaceutical industry and commented on the orderliness and level of sophistication in the laboratories. The R&D facility appears well equipped and staffed to handle the diversity of activities needed to shepherd a pharmaceutical product from pre-formulation, through regulatory compliance and manufacturing scale-up, to a viable commercial product. Since Northwest Vista's Nanotechnology Program requires internship experience for graduation, and DPT plans to offer paid summer internships, it is likely that Nanotechnology Club members will take advantage of this excellent opportunity to gain real-world experience in transferring cutting-edge nanoscale technology to the flourishing pharmaceutical field.