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To Whom It May Concern:

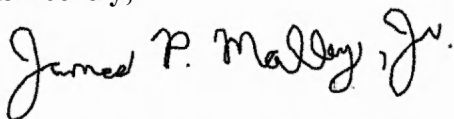
This letter is to verify that Ed Neister in conjunction with the UNH Environmental Research Group did perform irradiation tests using the MS-2 bacteriophage virus in our laboratory. The MS-2 bacteriophage virus has been used in our laboratory for over ten years as an indicator organism for ultraviolet (UV) disinfection equipment validation studies. The draft USEPA UV Disinfection Guidance Manual also refers to the use of MS-2 as an approved surrogate. MS-2 is a relatively UV resistant virus requiring a UV dose of approximately 20 mJ/cm² for one log inactivation of MS-2. MS-2 is more resistant than all the human enteric viruses commonly studied with the exception of Adenovirus.

Three different lamps, including our standard 253.7 nm low pressure mercury lamp, were used to irradiate samples to determine the log inactivation (kill) of MS-2 for each lamp. Testing was batch, bench scale work using a collimated beam (or quasi-parallel-bundle) UV device. Dose was cross checked using intensity and time at the sample and total energy measured by a radiometer positioned on the opposite side of the lamp. Sufficient samples and controls were used to ensure data accuracy.

I have reviewed the data and the figures displaying the outcome of these tests and they are an accurate recording of the results. These data suggest that the Far-UV Sterilray™ lamps tested due to their emission spectrum (energy) and the action spectrum of MS-2 are significantly more germicidal than the standard 253.7 nm mercury vapor lamp under the conditions tested in our laboratory. Consideration of several additional factors including lamp efficiency, lamp life and matrix effects (such as the absorbance spectra of clean tap water), needs to be included in any commercial scale application of these promising Far-UV Sterilray™ lamps but that was not within the scope of the tests performed at UNH.

If there are specific questions about these UNH data do not hesitate to contact me.

Sincerely,



James P. Malley, Jr., PhD