Department of Biological Sciences

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*Pseudomonas aeruginosa* Phages

*Pseudomonas aeruginosa* is perhaps the most genetically complex prokaryote, as it may contain either or both DNA and RNA viruses and two to four chromosomes. The strain of *P. aeruginosa* designated PAF and two strains isolated by Kathleen Marquis, PAM 9 and PAM 9RF, together with two kinds of bacteriophages, Aeruginosa Marquis 13 and 27C (AM13 and AM27C) were the focus of my summer research studies.

My project examined the relationships between the two bacteriophages and the relationships among the strains of *P. aeruginosa*. Phage typing was used to distinguish the relationships among the phages and host strains. There was no evidence of plaque formation by AM13 on PAM 9, while small, clear plaques were formed on PAF and PAM 9RF. Adsorption studies revealed rapid adsorption of AM13 by PAF and PAM 9RF, but no significant adsorption by PAM 9. Therefore, this suggested that PAM 9 had no receptors for phage AM13. In contrast, when PAF, PAM 9, and PAM 9RF were plated with AM27C, plaques were observed, but in varying visibility. Phage AM27C plated on PAF and PAM 9RF at 40°C formed extremely turbid, difficult to see plaques, while incubation at 30°C resulted in clearer plaques, although still turbid relative to AM27C plaques on PAM 9 at either temperature. Single-step infections revealed AM27C production by all three strains, but far lower yields of virus from strains PAF and PAM 9RF. Such low productivity could explain the relative turbidity of plaques on those two strains.

My experiences as a Howard Hughes Summer Intern provided a valuable foundation in biological research. The internship also provided an opportunity to learn and develop microbiological techniques and skills that will foster my development within this field of research, such as working with bacteriophage, and interpreting, analyzing and presenting scientific data.