Acinetobacter baylyi, a gram-negative soil bacterium, is highly competent for natural transformation and exhibits twitching motility, a motile movement across a surface. A. baylyi is non-pathogenic and easily cultured, making it an ideal bacterium for study. The purpose of the study was to explore the effects of DNase, DNA, and degraded DNA (DNA+DNase) on twitching motility.

LB broth was inoculated with ADP1 Wild Type Cultures. Petri dishes with LB and LBK agar were inoculated with each of: 2µL Sterile Water Control, 1µL Sterile water+1µL DNase, 1µLSterile Water+1µL DNA, 1µLDNase+1µL DNA. Two cultures were tested to improve reliability of results. DNA, DNase, and both DNA and DNase were added to WT cells and cultured on LB and LBK soft agars. Petri dishes with 10 mL, 15 mL, and 20 mL of agar were tested. Two cultures were tested to increase the reliability of results. Inoculums were pipetted onto the agar and incubated for 5½-6 hours at 37°C. Two perpendicular diameters were measured and averaged. Statistics were performed to determine the significance of the data.

The hypothesis that degraded DNA would have the greatest impact on twitching in A. baylyi was unsupported. DNA, DNase, and DNA+DNase all significantly reduced twitching (p<0.01). This response to degraded DNA and DNA suggests that A. baylyi can react to DNA, suggesting that A. baylyi may have chemotaxis capabilities. The results also suggest that competence and twitching may share a common mechanism.