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# Identifying Antimicrobial Resistance Genes with DNA Microarrays

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We developed and tested a glass-based microarray suitable for detecting multiple tetracycline (*tet*) resistance genes. Microarray probes for 17 *tet* genes, the β-lactamase *bla*TEM-1 gene, and a 16S ribosomal DNA gene (*Escherichia coli*) were generated from known controls by PCR. The resulting products (ca. 550 bp) were applied as spots onto epoxy-silane-derivatized, Teflon-masked slides by using a robotic spotter. DNA was extracted from test strains, biotinylated, hybridized overnight to individual microarrays at 65°C, and detected with Tyramide Signal Amplification, Alexa Fluor 546, and a microarray scanner. Using a detection threshold of 3× the standard deviation, we correctly identified *tet* genes carried by 39 test strains. Nine additional strains were not known to harbor any genes represented on the microarray, and these strains were negative for all 17 *tet* probes as expected. We verified that R741a, which was originally thought to carry a novel *tet* gene, *tet*(I), actually harbored a *tet*(G) gene. Microarray technology has the potential for screening a large number of different antibiotic resistance genes by the relatively low-cost methods outlined in this paper.