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A novel microarray platform for monitoring the expression of bacteriophage tRNAs during host infection

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Transfer RNAs (tRNAs) are small non-coding RNAs expressed in all living organisms. They are essential components of the translation machinery and are responsible for the synthesis of proteins from messenger RNAs. Viruses are obligate parasites that evolved to minimize the size of their genome. As a result, they typically don’t encode any elements of the translation machinery and hijack the host’s tRNAs and ribosomes for the synthesis of viral proteins. D29 is one of many bacteriophages that infect *Mycobacterium smegmatis*, a nonpathogenic bacterium often used as a model organism to study tuberculosis. Interestingly, D29 encodes five unique tRNA genes specific to Asn, Trp, Gln, Glu and Tyr amino acids. We suspect that these viral tRNAs are expressed during infection to complement the cellular machinery and boost the expression of viral proteins. To monitor bacterial and viral tRNAs expression, we designed and implemented a novel microarray platform. Our approach comprises three steps. First, *M. smegmatis* cultures, infected with D29, are spiked with radioactive orthophosphate; second, labeled total RNAs are trizol-extracted; third, RNA samples are hybridized on in-house printed microarrays and spot signals, the proxy for tRNA levels, are quantified by phosphorimaging. We will present here our tool to measure tRNA expression and discuss preliminary results.