

“Phenotype MicroArrays - a Platform for Phenotypic Characterization of Cells and Species Description”

Phenotypes provide a very useful way to describe the properties of cells and are a useful tool for describing and characterizing new species in great detail. Phenotype MicroArray (PM) technology allows a biologist to test nearly 2,000 phenotypes of a cell and gain a comprehensive overview of pathway functions in a single experiment. The phenotypic assays are designed from a physiological perspective to survey, *in vivo*, the function of diverse pathways including both metabolic and regulatory pathways. Included in the phenotypes are basic cellular nutritional pathways for C, N, P, and S metabolism (800 tests), pH growth range and regulation of pH control (100 tests), sensitivity to NaCl and various other ions (100 tests), and sensitivity to chemical agents that disrupt various biological pathways (1,000 tests). Examples with diverse microbial species will be presented to illustrate the use of the technology in improving genome annotation, discovering new cellular pathways, verifying the accuracy of genetics, analyzing mutants to determine gene function, studying cell metabolism and metabolic regulation, understanding the interplay of environment and metabolism on pathogenicity, studying and optimizing cell culture conditions, and looking at the effects of chemicals on cells.