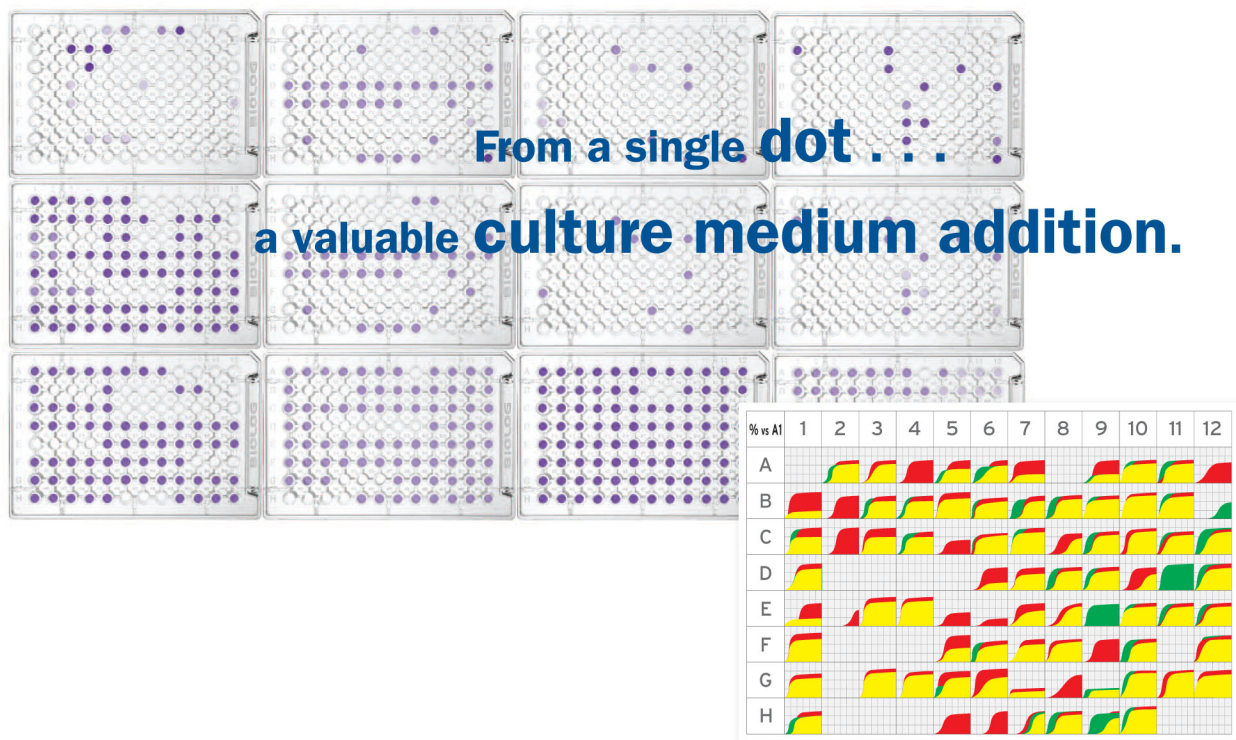


Phenotype MicroArrays

DISCOVERY ■ PROCESS DEVELOPMENT ■ VALIDATION



From a single experiment . . .
a new approach for process development.

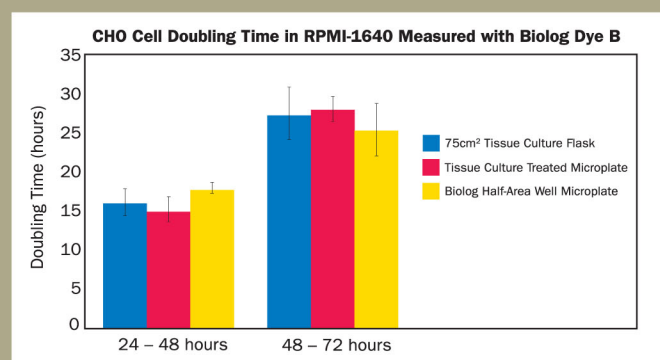
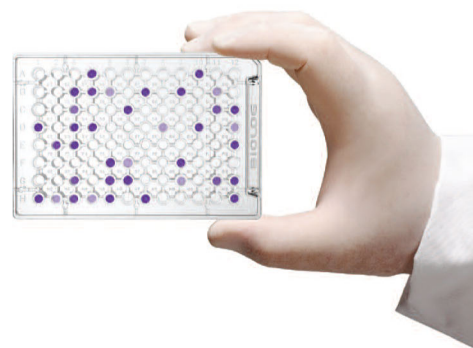
Phenotype MicroArrays™ for mammalian cells are a new process development tool for high-throughput testing of cell culture conditions that affect growth, productivity or cell-based bioassay responses. With Phenotype MicroArrays, every cell line yields a unique metabolic fingerprint that can be used to validate cell line stability and look for factors that may help predict bioreactor productivity. Protocols have been developed to screen for compounds that accelerate growth and productivity of CHO and other cells commonly used for production of biologics. In addition, the effects of complex interactions between culture medium components on cellular metabolism can be readily identified and exploited for cell culture medium development or optimization. Phenotype MicroArrays can also be used for cell-based purity and stability tests of raw materials or bioproducts. Other applications in cell therapy and regenerative medicine are in development.



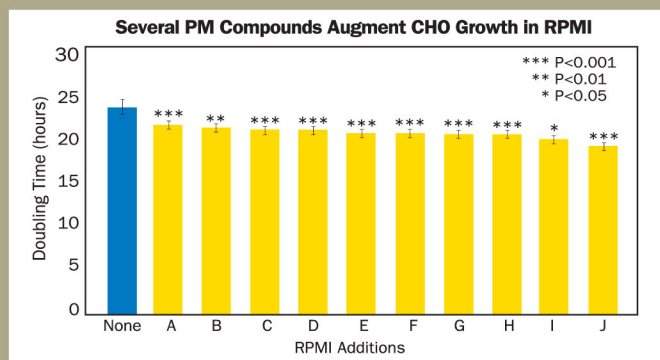
Automated incubation and data collection enable straightforward quantitation of cellular responses with minimal effort.

A comprehensive process development platform for high-throughput testing of cell culture conditions that affect growth, productivity or cell-based bioassay responses.

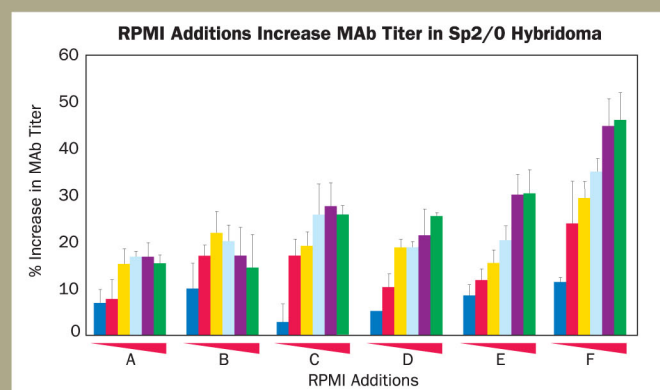
Each Phenotype MicroArray™ is a 96-well microplate where individual wells are pre-filled with different substrates. When cells and Biolog's proprietary redox dye mix are added, the rate at which substrates support or affect growth can be quantified within hours. For high-throughput applications and kinetic analysis, up to 50 Phenotype MicroArrays can be run simultaneously with Biolog's OmniLog® instrumentation and software.



Biolog's redox dyes can be used to measure cell growth rates. CHO-k1 doubling times are equivalent for static cultures grown in T-flasks, tissue-culture treated microplates and Biolog's half-area well microplates.



Doubling times were determined for CHO-k1 cells grown in static cultures using a Biolog Phenotype MicroArray containing 90 metabolic substrates that might augment culture growth in RPMI-1640. None of the compounds that augmented CHO-k1 growth in RPMI-1640 support CHO-k1 growth when substituted for the glucose in RPMI-1640 medium containing 0.3 mM Glutamine and 5% FCS.



Phenotype MicroArrays can be used to optimize the productivity of secreted proteins. Several factors that increase monoclonal antibody (MAb) titer by up to 50% in a dose-dependent fashion are shown. Factors affecting the production of cytokines or the output of any cell-based assay can also be readily identified.