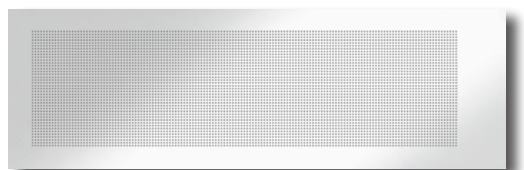


## Prospector™ High-Throughput Microbial Isolation, Cultivation and Screening System

The Prospector system enables microbiome analysis at unprecedented scale. The core of the system is a unique highly dense array of nanoscale cultivation chambers that can grow thousands of microcolonies in parallel. A bench-top system automates the isolation and cultivation workflow through software-driven imaging, picking and transfer of single isolates into standard multiwell plates for downstream analysis

### PROSPECTOR ARRAY

The Prospector array can capture individual bacteria and culture them in isolation from other strains. Arrays contain over 6000 nanoscale microwells, each of which represents a 3 nanoliter isolation and cultivation chamber. Loading an array with a complex but appropriately diluted microbiome sample



results in microwells containing a single bacterium. Clonal cultures can then be grown across thousands of microwells simultaneously, providing ready access to a large and diverse library of isolates, including rare and slow-growing isolates that cannot be outcompeted in the array microwell, at a throughput not possible with classical workflows.

### PROSPECTOR BENCHTOP INSTRUMENT

The instrument's integrated optics enable automated fluorescent or colorimetric detection of array microwells with living isolates via growth indicators. The instrument then automatically picks and transfers those isolates to a standard multiwell plate. The system fits in an anaerobic chamber enabling high-throughput cultivation of isolates under anoxic conditions.



### EASY 3-STEP WORKFLOW WITH MINIMAL HANDS-ON TIME

1

Prepare microbial suspension

Complex raw sample



Microbial cell preparation



2

Cultivate microbes on array

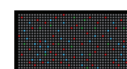
Dilute sample, load on array and incubate



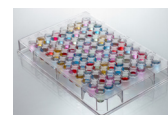
3

Identify and recover isolates

Automated imaging to identify targets



Automated transfer of isolates to 96-well plate



The workflow begins with preparation of a microbial suspension, followed by cultivation in the array's nanoscale microwells, then automated imaging and recovery of target isolates. Prospector's miniaturization together with the automated workflow offers significant reductions in hands-on processing time.

Comparisons of Prospector platform and standard approaches show up to 80% reduction in hands-on time associated with

doing a cultivation experiment, or about a day and a half worth of work per week. The hands-on time being eliminated is a very tedious, mundane set of activities, enabling scientists to gain back valuable time to do research. In addition, the system reduces the amount of space used in the lab, enabling scientists to do more experiments in parallel.

### ISOLATION, CULTIVATION AND IDENTIFICATION OF MICROBES FROM A COMPLEX SAMPLE

The Prospector system was used to isolate and cultivate microbial strains from an urban soil sample. A total of 1423 isolates were retrieved of which 1251 were identified taxonomically using 16S rRNA sequences. A large prevalence of *Pseudomonas*, *Microbacterium*, *Dyella*, *Burkholderia* and *Bradyrhizobium* were observed in the isolates. Organisms at lower abundance (<0.3%, inset image) were dominated by *Xanthomonadaceae*, *Phyllobacterium*, *Pelomonas*, *Moraxellaceae*, *Micrococcus* and *Inquilinus*. This demonstrates the power of the Prospector to isolate and culture a large and diverse collection of microbes from a complex sample.

