

Colony picking in synthetic biology

What is synthetic biology?

Synthetic biology is a broad term that refers to the manipulation of genetic pathways to harness the power of existing biological systems in novel ways (often to manufacture molecules or proteins). Synthetic biology applies principles that are derived from engineering, specifically design-build-test-learn cycles, to biological systems. By leveraging high-throughput workflows, synthetic biologists can accelerate this process.

Benefits of automated colony picking

- Enables higher throughput while minimizing manual labor
- Provides consistent, objective colony picking instead of subjective, manual picking
- Accommodates a broad range of different applications
- Electronic data tracking allows for well-documented data control



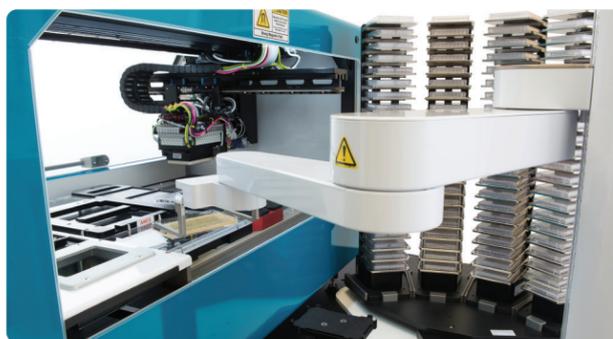
Picking the right colonies

For the synthetic biologist, biological building blocks are often generated from bacteria. The design-build-test process is utilized in order to engineer these building blocks. This often requires screening and picking colonies of interest.

Traditionally, colony picking is performed manually using sterile pipette tips, toothpicks, or inoculation loops, which is a slow, labor-intensive, and time-consuming process. Synthetic biology research can, therefore, benefit greatly from the flexibility and throughput of automated colony pickers. Not only will automated colony pickers make the entire process quicker (picking up to 3,000 clones per hour), but the results are more consistent and reliable, increasing the quality of the data produced.

Microbial colony pickers

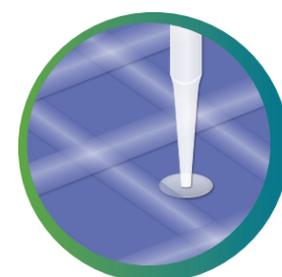
- Pick colonies accurately and efficiently using organism-specific pins that maximize material transfer
- Avoid cross contamination with a reliable pin sterilization process
- Support a range of applications such as high-throughput cloning, library screening, strain engineering, and CRISPR editing



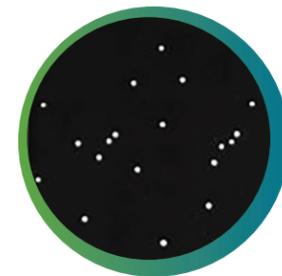
QPix™ 400 Series Microbial Colony Pickers

The QPix picker can be integrated with other lab components such as incubators, liquid handlers, and robotics for a fully automated work cell. Our customization and automation team can tailor QPix colony pickers and deploy the integration, or provide an open API and software support for the integration process.

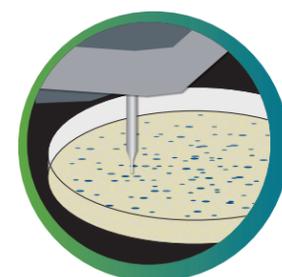
A typical QPix microbial colony picker workflow



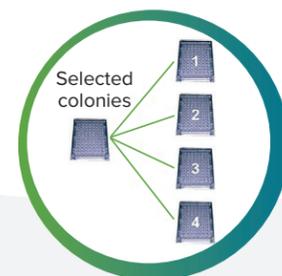
Plating



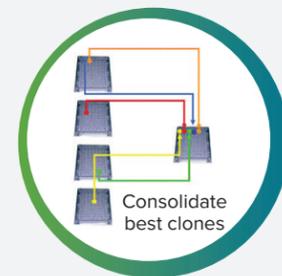
Screening



Picking



Replicating



Re-arranging

Anatomy of a QPix microbial colony picker

Modular integration with **automation and robotics for increased throughput**

Flexible bed setup allows the use of multiple formats of source and destination plates

Barcode reader provides **reliable traceability of data**

Automated plate de-lidding **maintains sterility**

Objective software data analysis and database integration **allow clear and concise record of experimental data**



Acoustic sensors detect agar height, helping high-precision robotics to **pick single colonies gently and accurately**

Organism-specific, interchangeable picking heads offer flexibility to **handle multiple organisms**

Wash baths and halogen heat sterilization **eliminate cross-contamination among pins**