

AccuraCode® - Highly Multiplex RNA Sequencing To Accelerate Drug Screening

High-Throughput, Scalable, Fast and Cost-effective

High-throughput screening is an integral part of drug discovery and development. Uncovering the impact of different compounds and conditions on the transcriptome can help determine the mechanisms of drug interactions or the effect of a perturbation.

AccuraCode® combines accurate cell barcoding technology with bulk RNA-seq to generate RNAseq library of hundreds of samples in one tube, greatly accelerating the speed, efficiency, and reproducibility of transcriptome-based screening. Thousands of compounds or perturbation conditions can be evaluated and comprehensive chemogenomics databases can be built at a fraction of the time and cost.

Highlights

- **AccuraCode® barcoding technology** to multiplex RNAseq library prep of up to 384 samples in one single tube
- **From cells to RNAseq libraries in 6 hours:** no RNA extraction required
- **Consistent and reproducible results**

Accelerate RNA-seq Large Scale Screening With Sample Barcoding

AccuraCode® uses RT primers containing plate-based barcodes to effectively capture and label mRNA from different samples. The captured mRNA can be pooled in one streamlined RNAseq library construction reaction that combines reverse transcription and cDNA amplification, greatly reducing the time and labor required for high throughput RNAseq library construction. Up to 384 RNA-seq libraries can be generated in only 6 hours.

Furthermore, the presence of UMIs on the RT primer enables precise mRNA quantification by correcting possible amplification bias during library preparation (Figure 1).

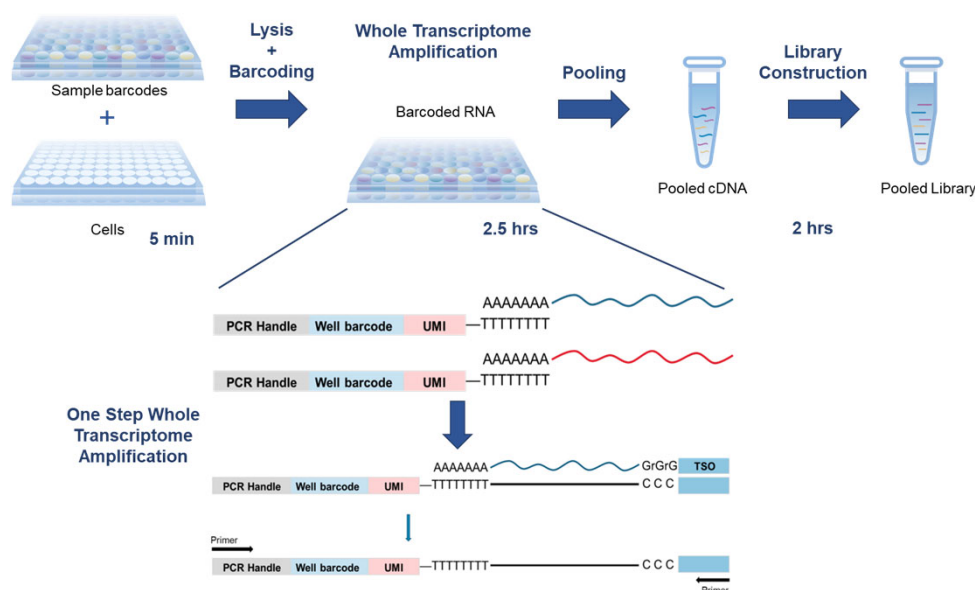


Figure 1. AccuraCode® workflow. The complete protocol of cell lysis, barcoding, whole transcriptome amplification, and library construction of up to 384 samples can be finished in about six hours.

Consistent And High-Quality Results

The AccuraCode® multiplexing technology processes different samples in a uniform library prep procedure, minimizing sample-to-sample variation and making it more reliable to compare different conditions. Preparation of multiple libraries followed by sequencing at 1 million reads per sample shows high reproducibility. The number of genes and UMIs are consistent among all replicates (Figure 2 A/B).

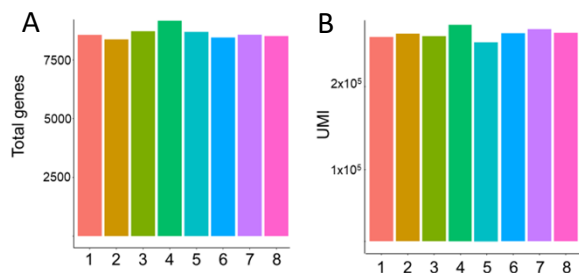


Figure 2. High reproducibility and sensitivity. **A and B:** Numbers of genes and UMIs per sample are reproducible in 8 replicates (A549 cells) prepared in parallel, respectively. Each replicate was sequenced to 1 Million reads.

AccuraCode - Effective Tool for Drug Screening

The high multiplexing and reproducibility of AccuraCode protocol make it an effective tool for high-throughput drug screening. As a proof of principle, A549 human lung cancer cells were treated with compounds B, P, and T at different concentrations for different time courses (Figure 3A). Drug treatment resulted in compound-specific changes of various transcripts, shedding lights on molecular mechanisms of each treatment (Figure 3C – after 24h treatment). The capability of AccuraCode to obtain information on the changes induced upon drug treatment on the whole transcriptome at a fraction of costs and time also makes it a perfect tool to construct chemogenomics library and database.

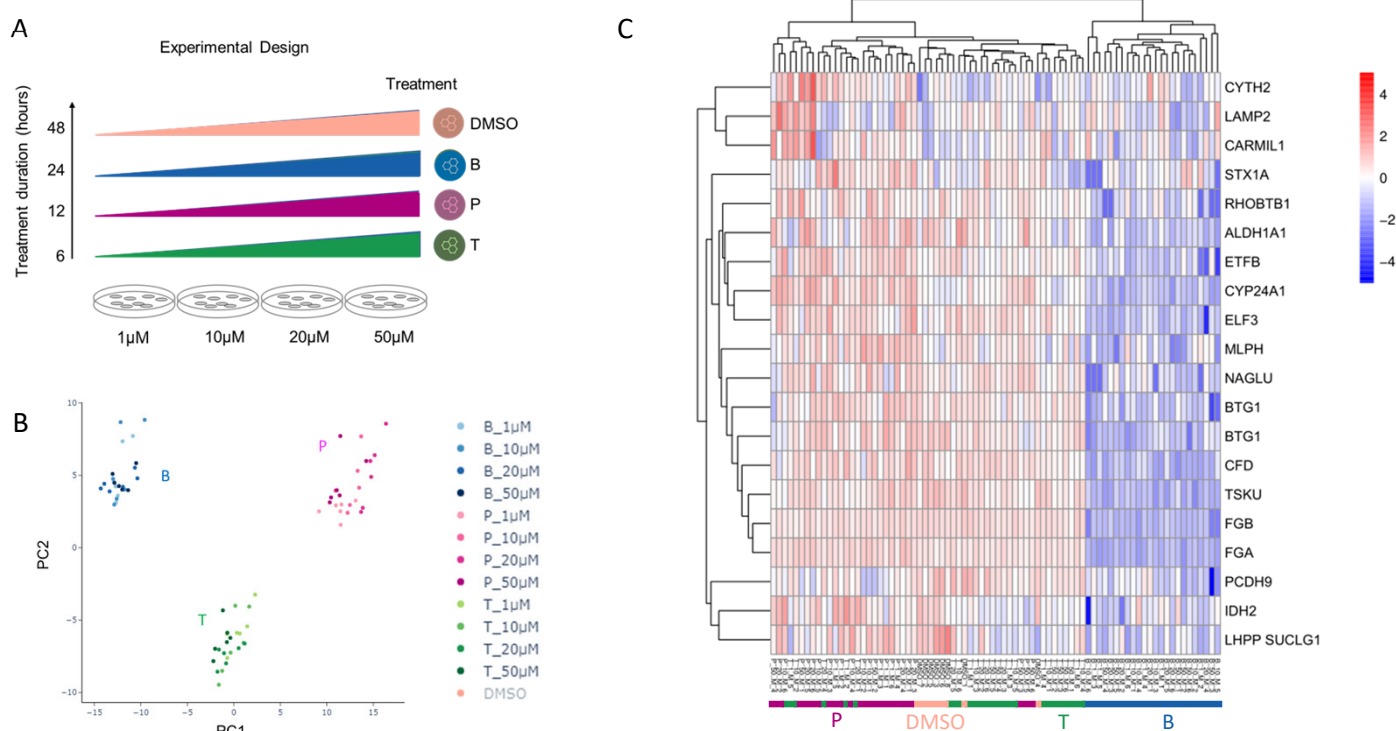


Figure 3. Drug Screening. **A.** Cells from lung cancer cell line A549 were treated with 3 compounds at different concentrations for 6 hours, 12 hours, 24 hours, and 48 hours. Each condition was tested with replicates. **B.** Principal Component Analysis (PCA) reveals cells clusters based on different treatments, 24h timepoint shown. **C.** Differentially expressed genes are identified in cells treated with different compounds, after each treatment, allowing the exploration of the mechanisms involved in the cellular response, 24h timepoint shown .

Product	Catalog Number
AccuraCode [®] HTP OneStep RNAseq Kit (96 Well) – 4 Rxns	1071065
AccuraCode [®] HTP OneStep RNAseq Kit (384 Well) – 1 Rxn	1071064

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