PRCISR™ CRISPR:
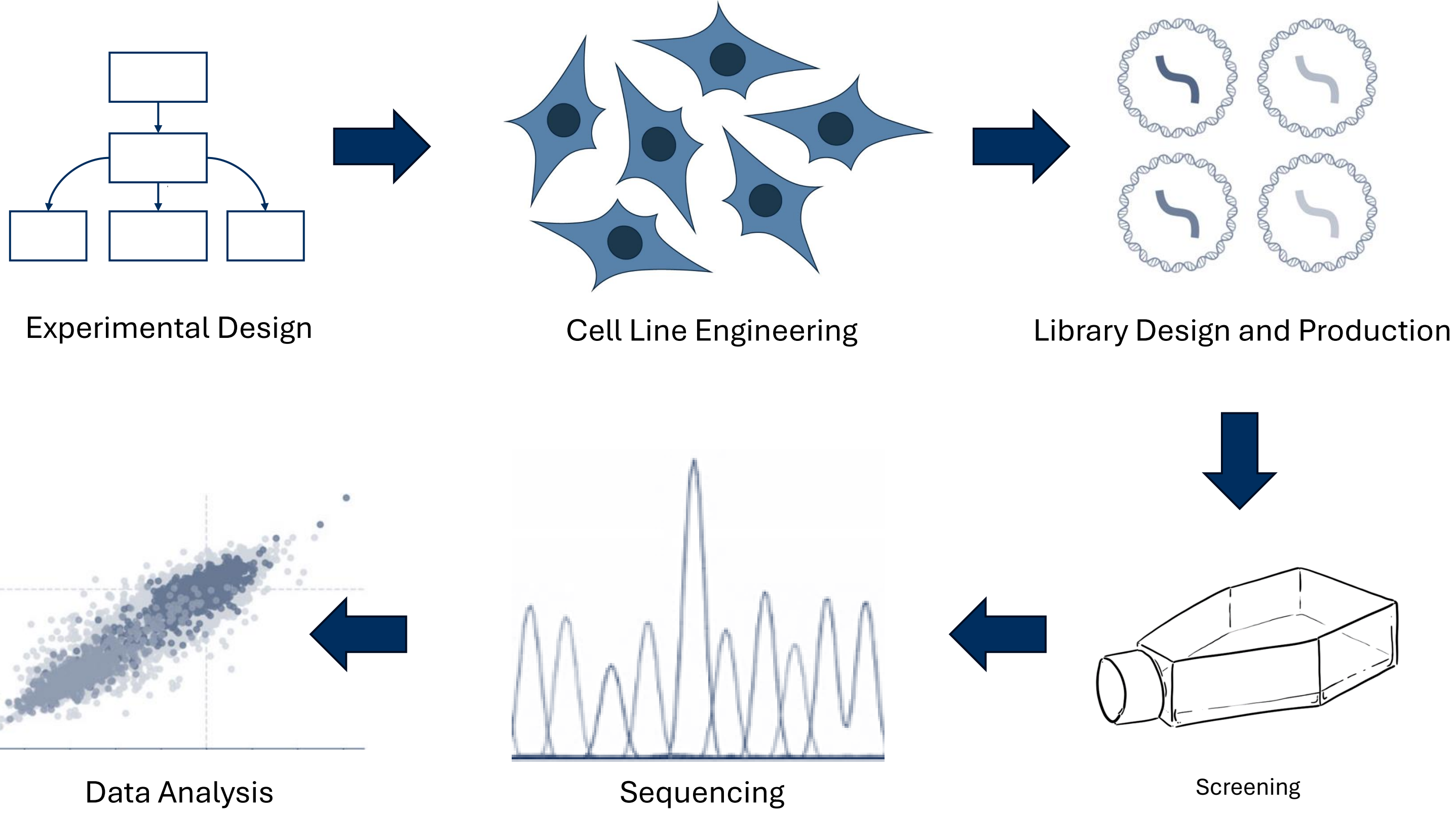## PCR-free Libraries & Screening Services

Angela Hinchie, Elena Vialetto
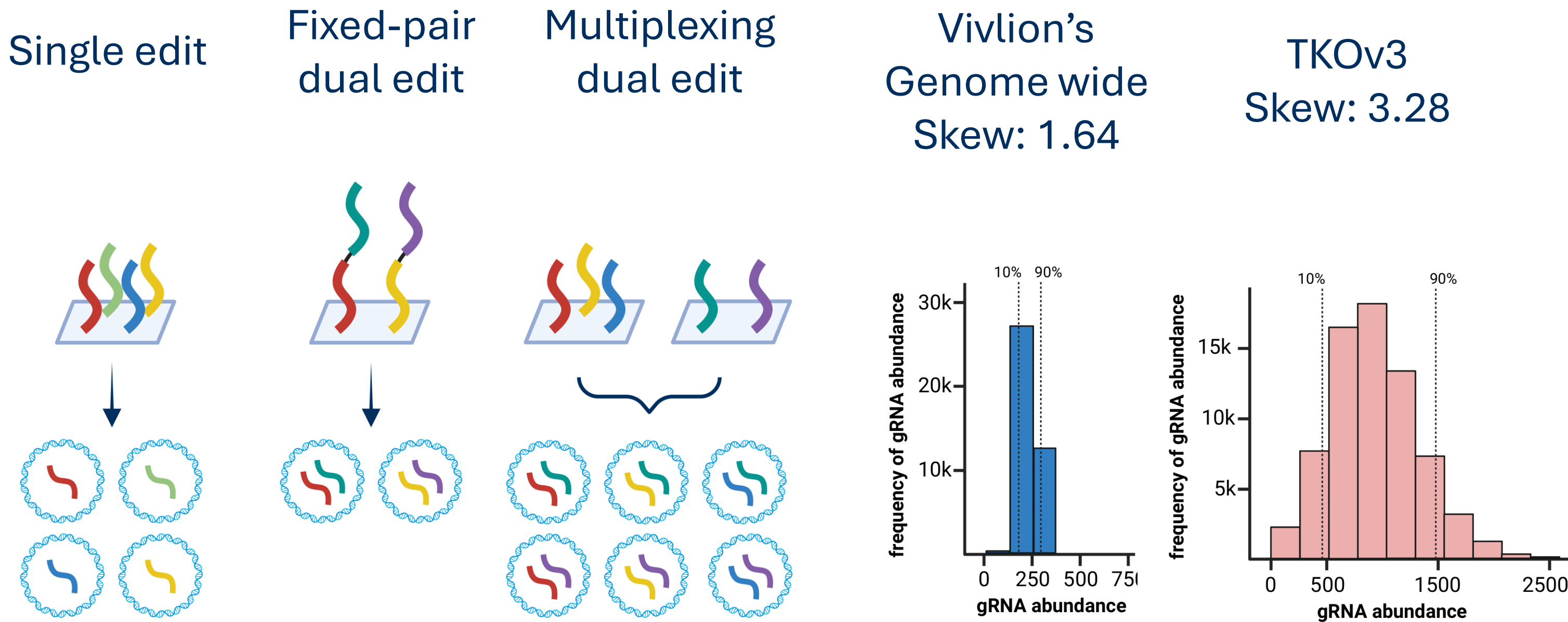
Vivlion's PRCISR™ CRISPR platform

PRCISR™ CRISPR is Vivlion's **full-service** CRISPR-enabled discovery platform that solves key challenges of CRISPR screening, thereby optimizing the target identification process.

Experimental Design — Cell Line Engineering — Library Design and Production — Screening — Sequencing — Data Analysis

High Throughput CRISPR Screening Service

Since the inception of CRISPR-Cas editing, scientists have recognized the value in using it for forward genetic screens. Conducting a full-sized screen is a monumental task that can yield exciting genetic findings – but only if done correctly. Vivlion offers support for each step of the screening process, from initial design to the data analysis.

Diverse and uniformly distributed CRISPR libraries

Single edit — Fixed-pair dual edit — Multiplexing dual edit

Vivlion's Genome wide Skew: 1.64

TKOv3 Skew: 3.28

What is uniformity and why does it matter?

Library skew measures the ratio of the most to the least represented gRNAs in a library. Unequal distribution and guide loss can hinder bioinformatic analysis and lead to lower confidence results. Vivlion's proprietary 3Cs synthesis method results in more uniform libraries with fewer dropped guides than conventional production methods. Conducting the same screen with a more uniform library yields more high confidence hits.

Alexandria: Choosing the best guides for the job

Vivlion's Alexandria library was created by analyzing empirical data on gRNA activity and identifying the most active guides over a wide range of contexts. This improved library is available in single and dual-targeting formats and further improves the CRISPR screening process.

gRNA 1 — gRNA 2,7 — gRNA 3,4,5,6

Vivlion GmbH, Frankfurt am Main, Germany
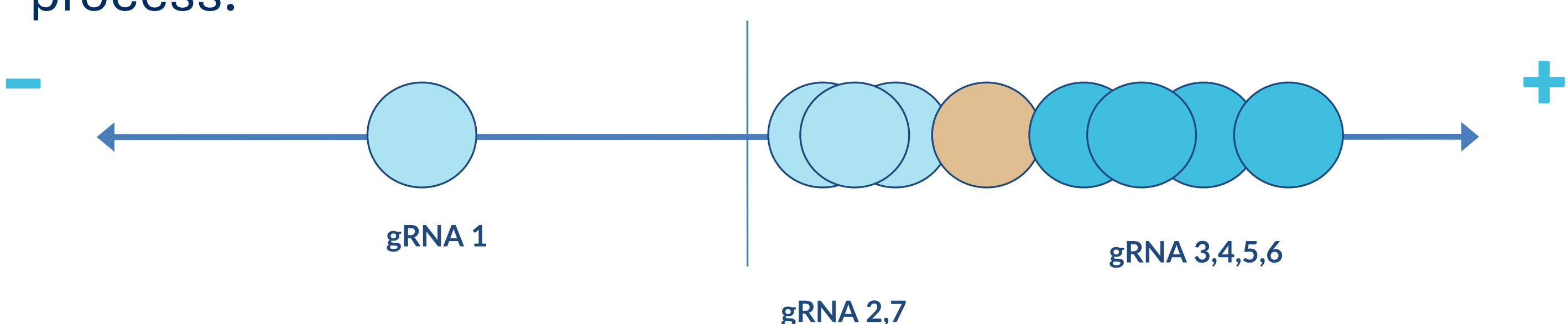
Vivlion proudly works with: **REPARE THERAPEUTICS**
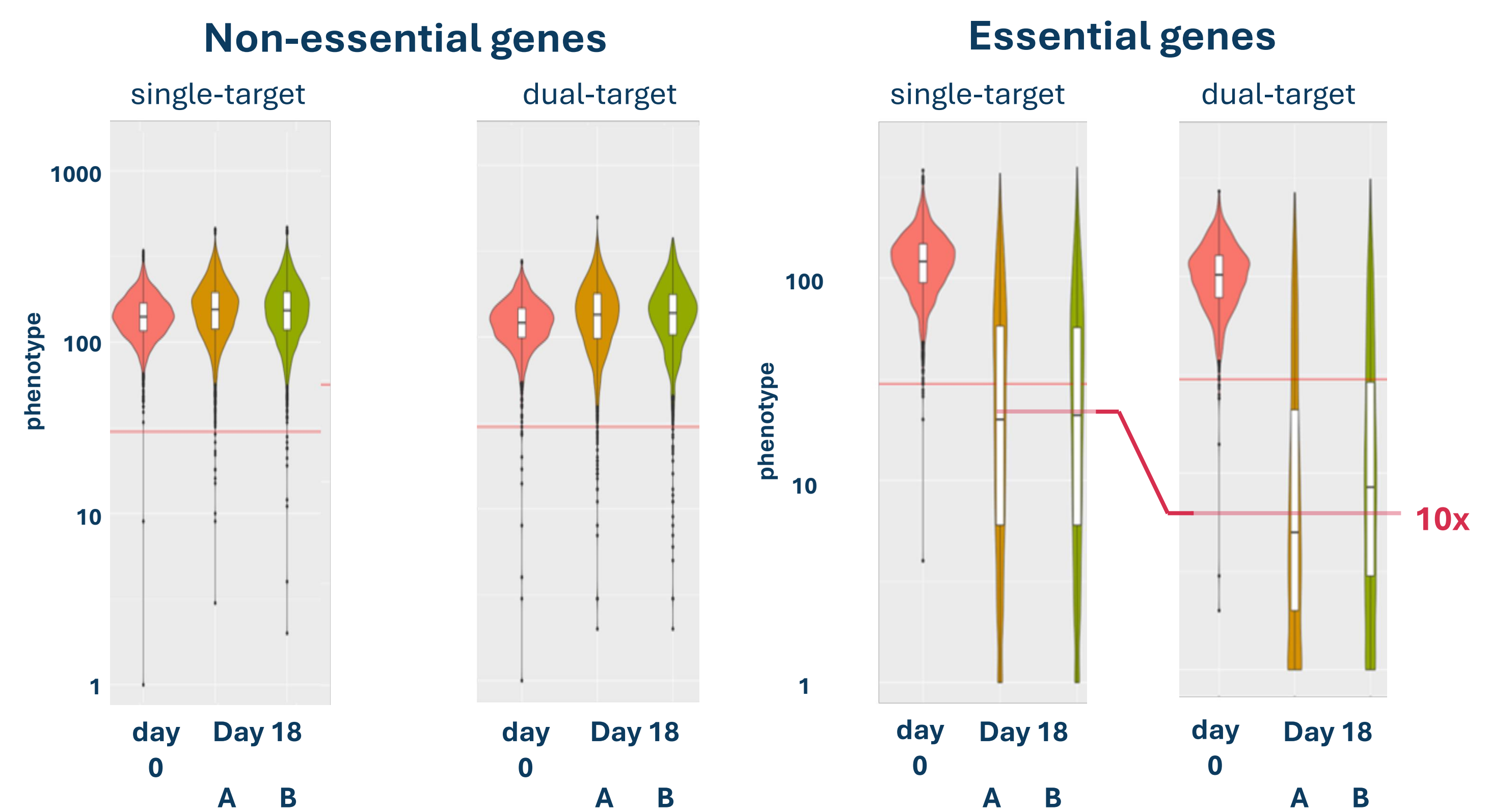
Low Skews facilitate downscaling and parallelization

Conventionally cloned CRISPR libraries have high skews that lead to low confidence in potential hits as shown by Vivlion's partner Repare Therapeutics. The conventional library had a higher skew and showed fewer hits when screened at 100x as compared to 400x. The TKOv3-3Cs maintained a high hit retention rate even at a 100x as compared to the conventional library at 400x.
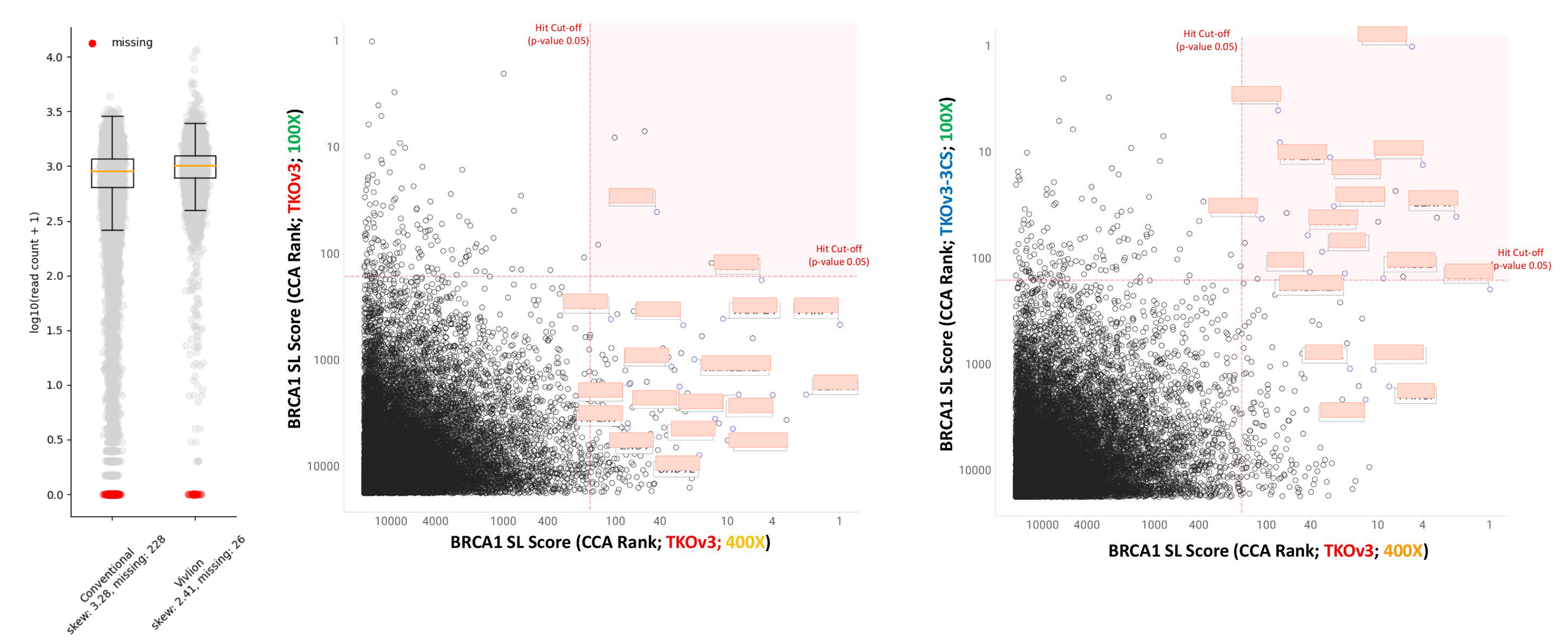
Dual-targeting increases editing efficiency up to 10x

Targeting the same gene with two gRNAs increases the probability of efficient gene knock out by a factor of 10x as shown by Vivlion's partner Repare Therapeutics.

Non-essential genes — single-target — dual-target

Essential genes — single-target — dual-target — 10x

Figures courtesy of Repare Therapeutics.

PRCISR™ CRISPR Services

Screens	Libraries	Bioinformatics
• Experimental planning and design	• PCR-free production	• *In-silico* library design
• Combinatorial options	• Highly uniform	• Customizable for singular and combinatorial edits
• Multiple readouts supported	• Customizable	• Established pipelines
• High throughput lab capacity	• Validated gRNAs	• Genetic interaction maps
• Experienced CRISPR scientists	• Available in single, dual and combinatorial formats	• Data integration

References:
Wegner et al., eLife 2019 | Henkel et al., BMC Biology, 2020 | Diehl et al., NAR, 2021 | Wegner et al., Bioinformatics, 2023