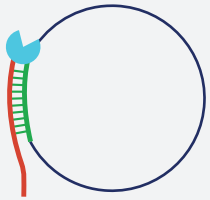
Sequencing, Rebuilt

Element Biosciences

Avidity base chemistry (ABC) separates and independently optimizes each sequencing process to increase quality while decreasing cost. Follow each step of a run from the level of a flow cell and see how our technology fundamentally transforms sequencing to accelerate scientific discovery.

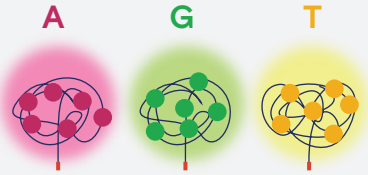


Hybridize DNA
Circular DNA template attaches to **surface primers** coating the flow cell via an **adapter**.

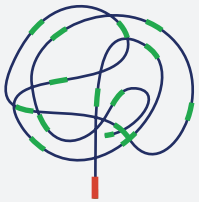
An **avidite** is a dye-labeled polymer with multiple nucleotide arms carrying the same nucleotide base.

Bind Polonies and Avidites
An engineered polymerase binds a primer-hybridized polony and an avidite nucleotide arm without incorporation or extension. Many arms bind to primer-hybridized regions in a polony, creating an ultrastable multivalent complex. Polymerase base-pair discrimination binds the correct avidite to each polony.

Wash Avidites
A wash removes unbound avidites to leave only avidites bound to polonies. Ultratight binding enables a 100x reagent dilution, fundamentally decreasing cost.



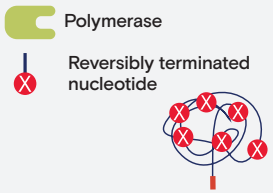
Detect Bases
Florescent signals in four channels correlate with A, T, G, or C avidites. Low-binding surface chemistry makes the signals more prominent for highly accurate detection.



Generate Polonies
RCA copies the template DNA and rolls each strand into a tightly bound polony—no PCR, no copies of copies.

SBS combines base detection and strand extension, consuming micromolar reagent concentrations to complete the reaction while signal persists. In contrast, ABC separates the steps and leverages multivalent binding stability to require only nanomolar avidite concentrations. Multiple binding events for each avidite ensure persistent signal for base detection.

Remove Blocks
Removing and converting blocking groups to terminal 3' hydroxyl groups allows the next cycle to begin on the primer strands, through ~600 cycles.



Step and Block
An engineered polymerase incorporates an unlabeled, blocked nucleotide to extend hybridized primers by a base.

Remove Avidites
Buffers remove avidites from the polonies.

Learn more at **elementbiosciences.com/technology/avidity-base-chemistry**

For Research Use Only. Not for use in diagnostic procedures. | LT-00020 Rev. B | December 2023

Information in this document is provided for research use only and is subject to change without notice. © 2023 Element Biosciences, Inc. All rights reserved. Element Biosciences and the Element Biosciences logo are trademarks of Element Biosciences, Inc. Other names mentioned herein may be trademarks of their respective companies.
Visit elementbiosciences.com for more information.