CHEMICAL AND PHYSICAL BIOLOGY

High-Throughput Epitope Determination of HIV-1 Polyclonal B Cell Repertoires

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For over 30 years, an HIV-1 vaccine has remained elusive due to the high mutability and tremendous levels of genetic diversity exhibited by the virus. Current research efforts have focused on understanding B cell-encoded antibody responses to HIV-1 infection to help inform vaccine design. Specifically, the analysis of B cell receptor (BCR) specificities arising from infection is valuable for optimizing the design of epitope- and germline-targeting HIV-1 immunogens. Unfortunately, the BCR specificities in an individual are polyclonal and difficult to characterize using currently available methods. Here, we introduce a LIBRA-seq based assay for antibody epitope determination, providing the ability to simultaneously obtain functional information about antibody epitope specificity together with paired heavy- and light-chain B cell receptor sequence for thousands of individual B cells in a polyclonal sample.

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