



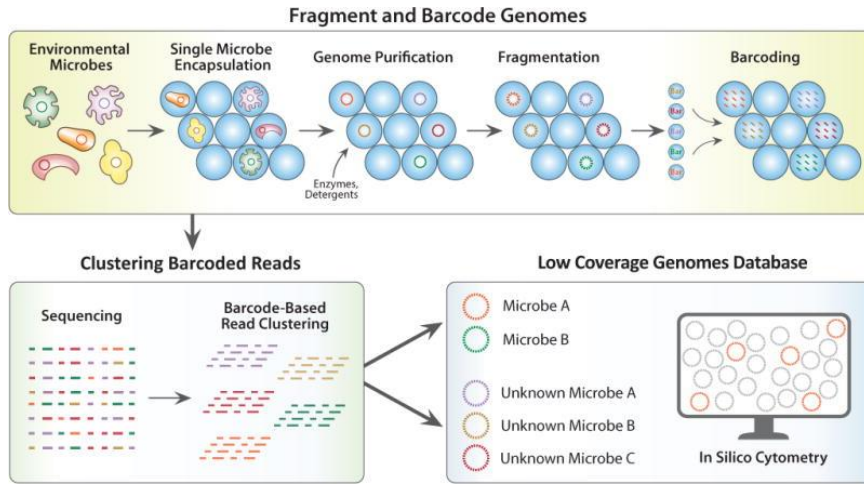
University of California
San Francisco

Easily Accessible Single-Microbe Sequencing (EASi-seq) to Generate Microbiome Atlas

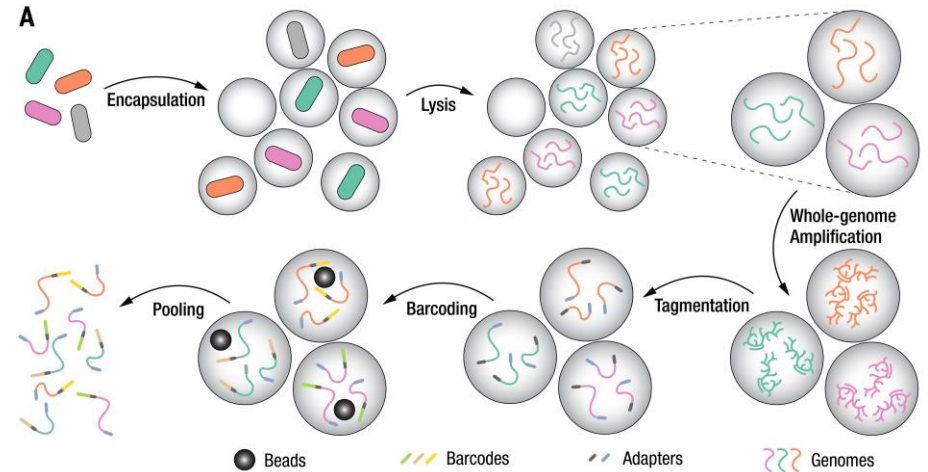
Xiangpeng Li

1/5/2024

High-throughput single microbe sequencing methods

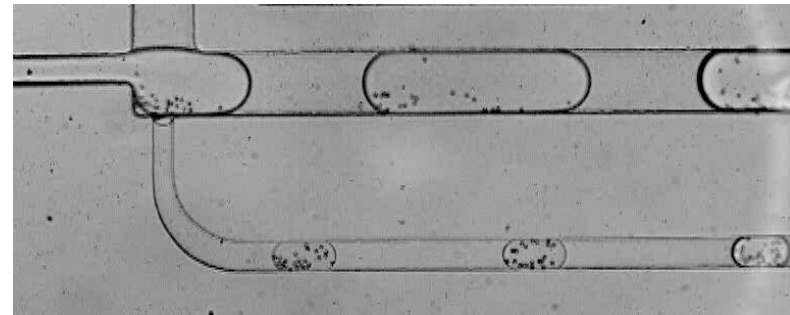
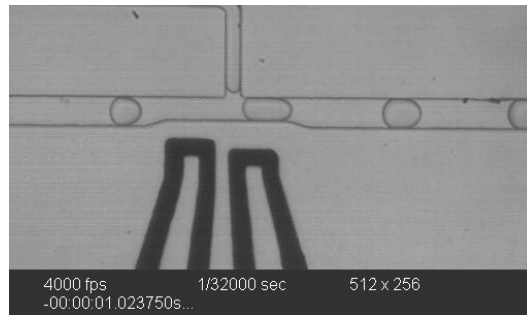
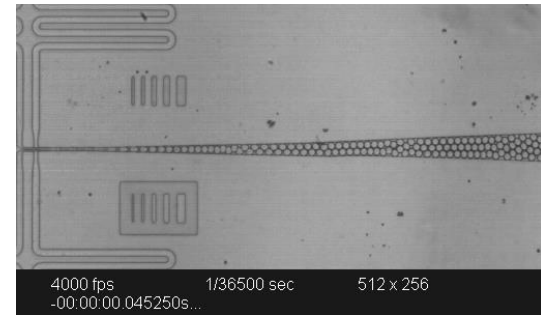


[Nat Biotechnol. 2017, 35\(7\): 640-646.](#)

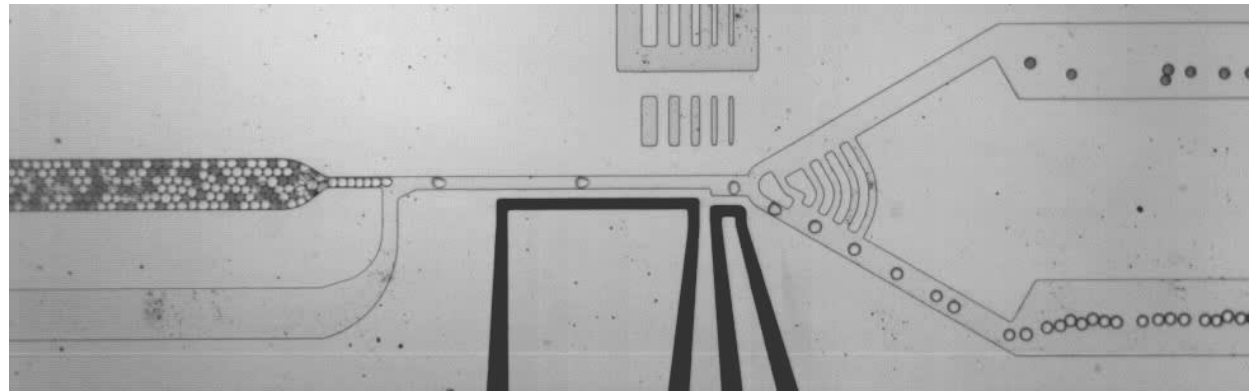


[Science 376, eabm1483 \(2022\)](#)

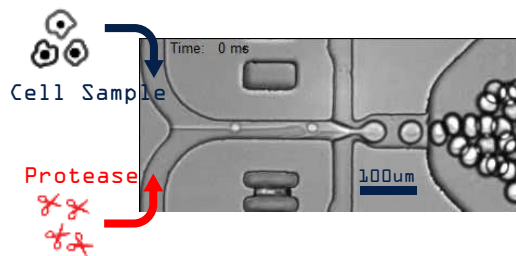
Droplet microfluidics



- 100M reactions
- Single molecules, cells



1) Encapsulation with Protease

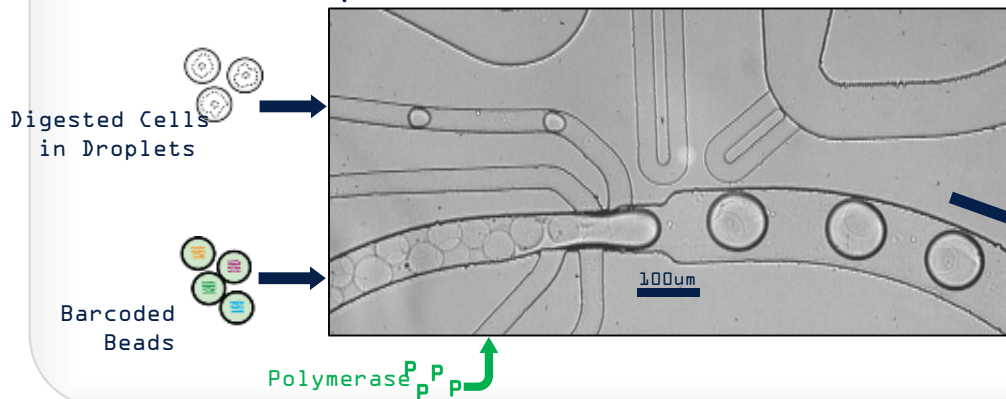


Heat-Inactivate Protease

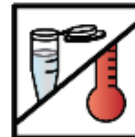
Digested Cells
and Protease



2) Re-Encapsulation with Beads



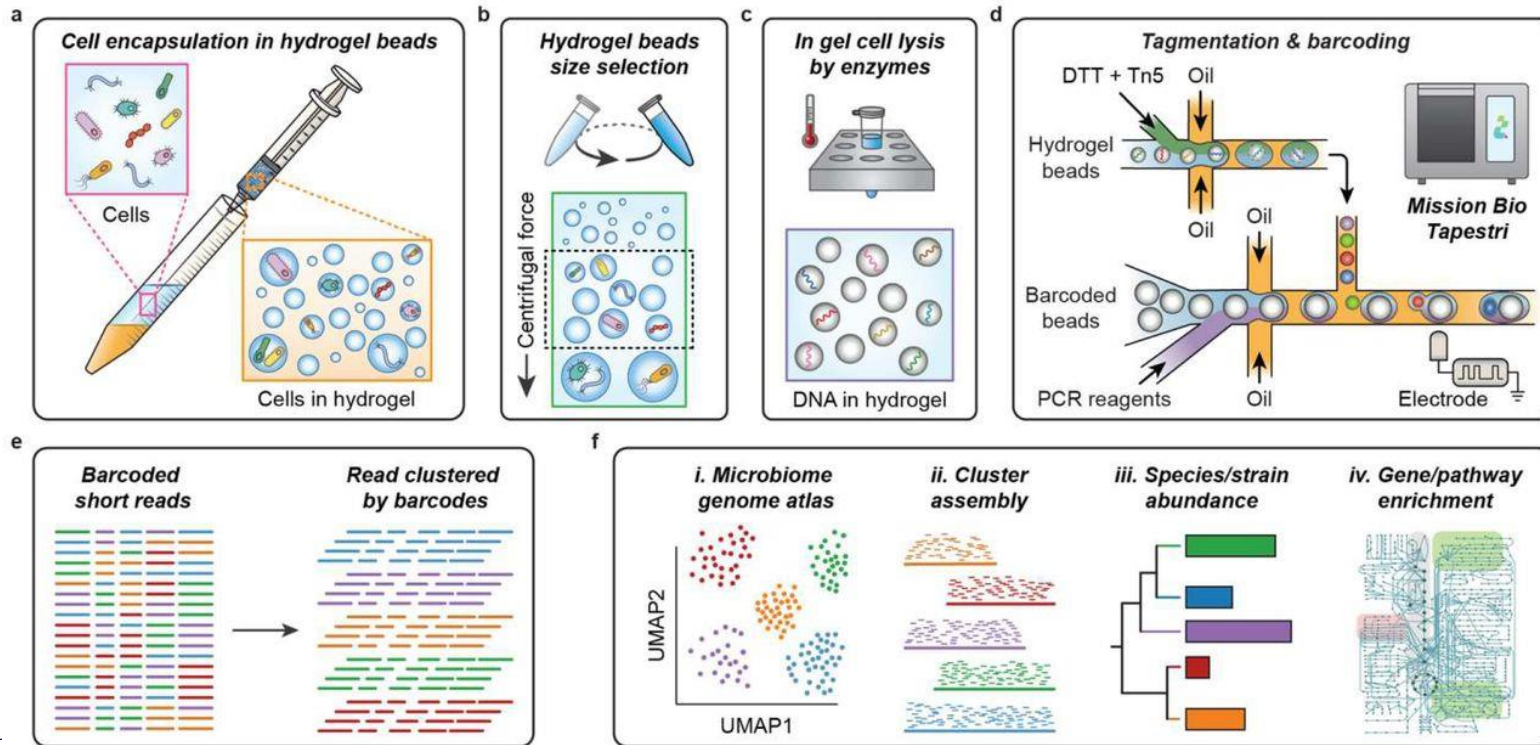
Cells and
Barcodes



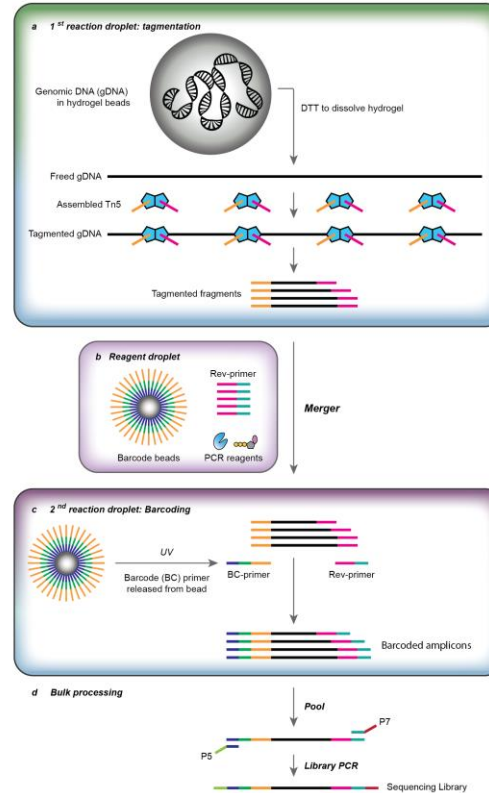
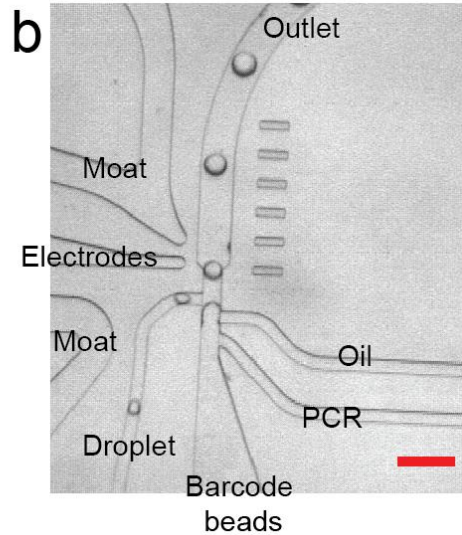
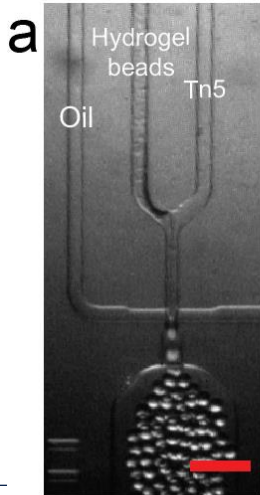
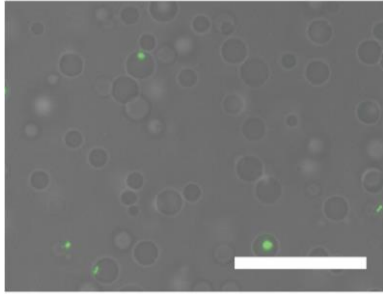
Barcoding via PCR

EASi-Seq

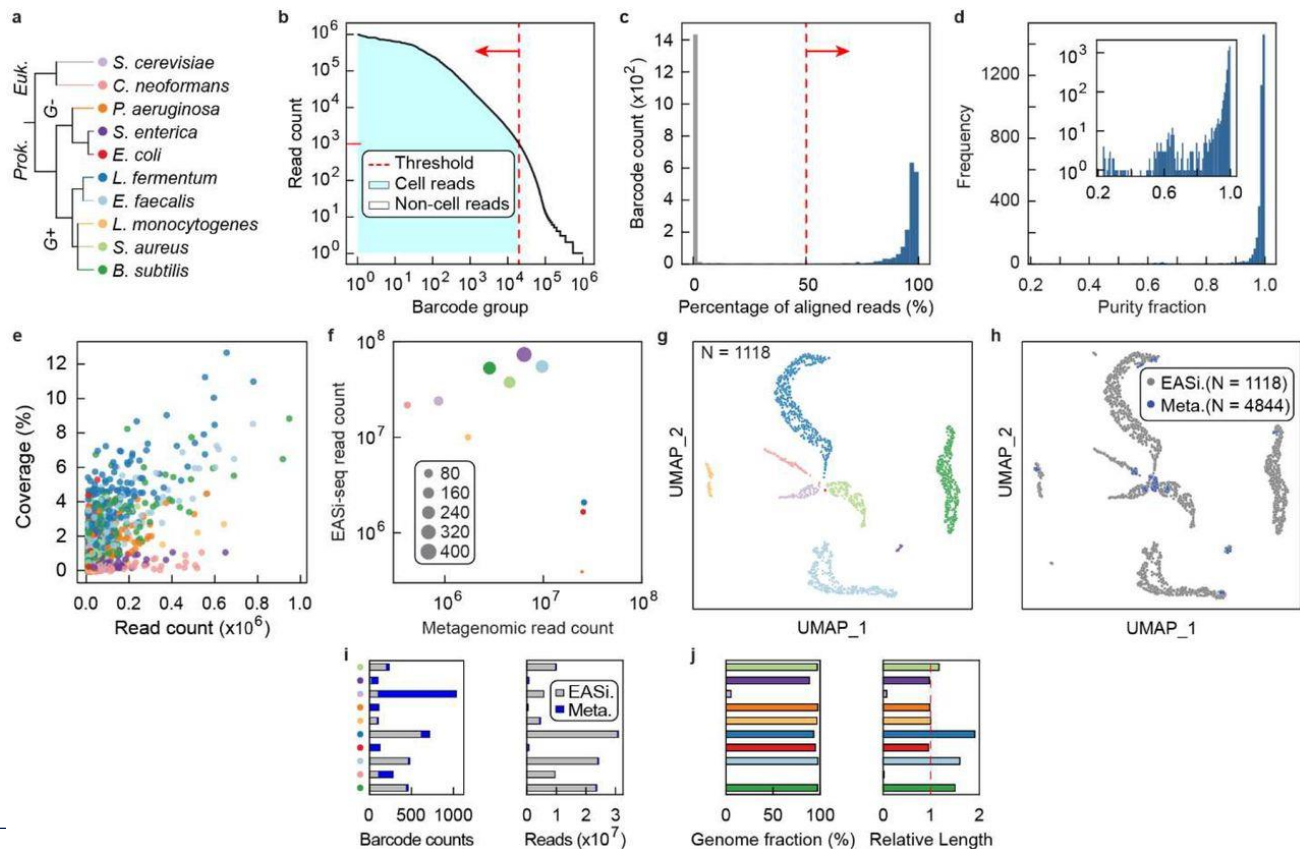
Easily Accessible Single microbe genomic DNA Sequencing



Molecular biology in droplets

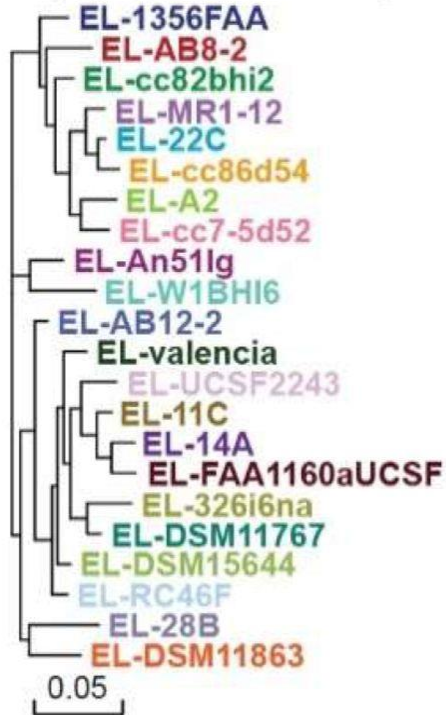


EASi-seq validation with synthetic community

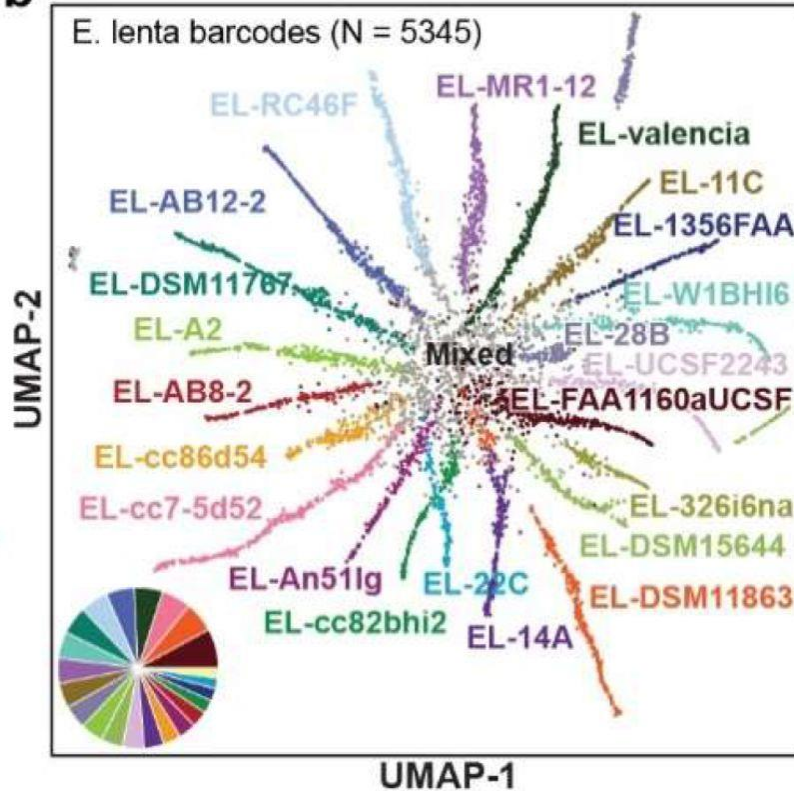


EASi-seq has strain level resolution

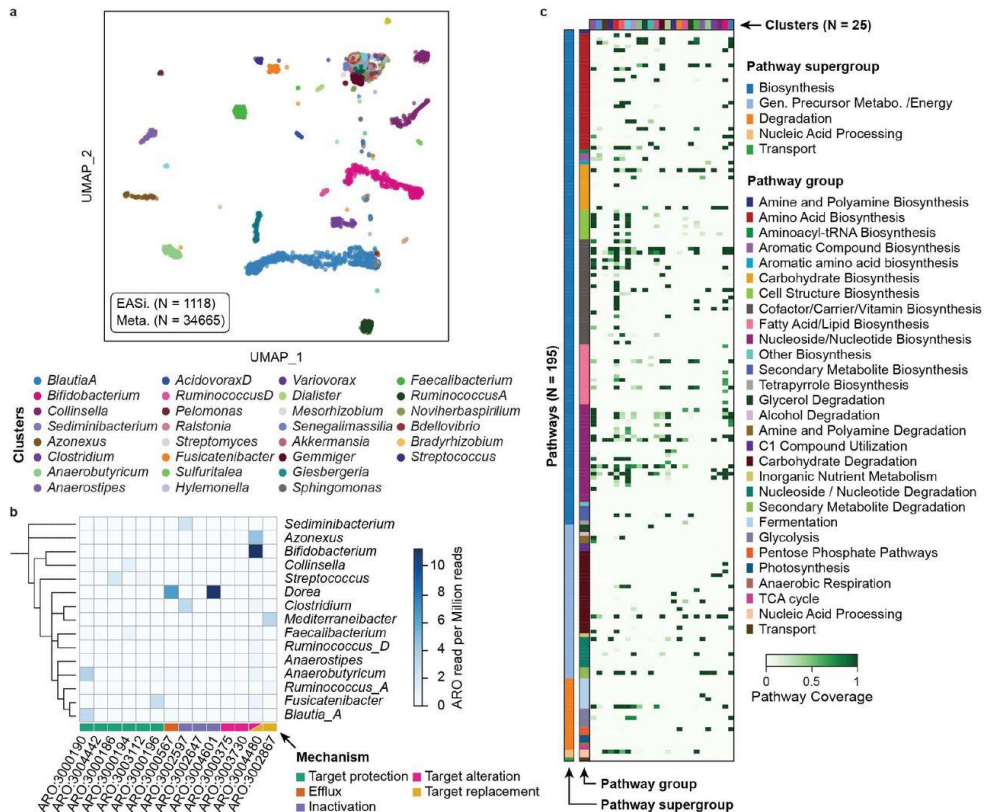
a *E. lenta* (22 strains)
synthetic community



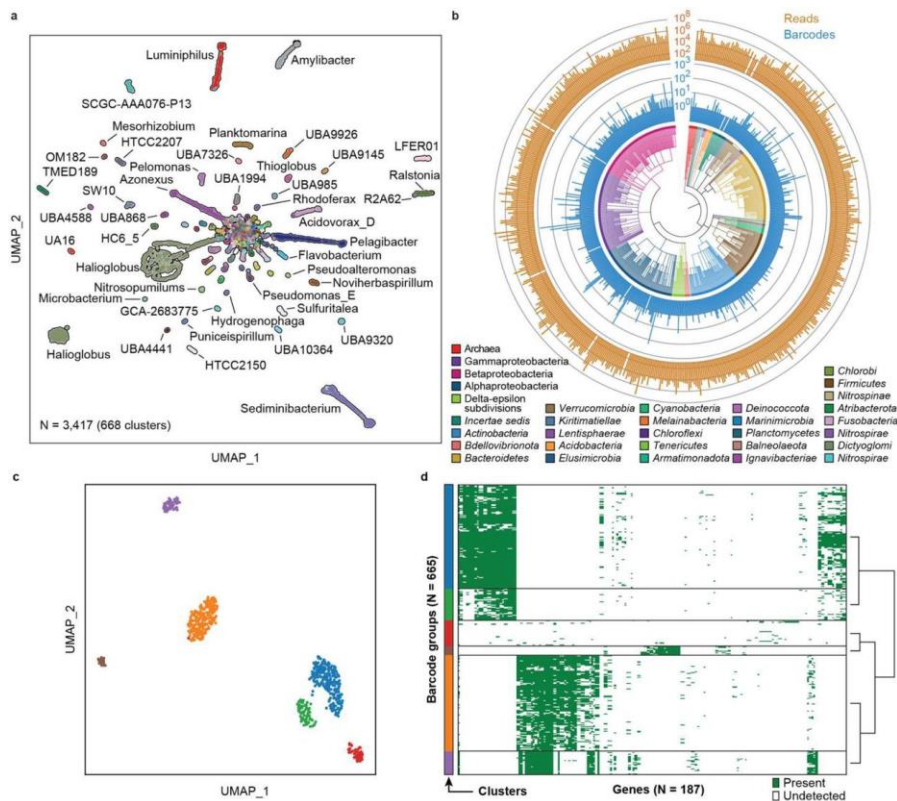
b



EASi-Seq analysis of human microbiome sample



EASi-Seq analysis of coastal sea water microbiome





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