2010
Environmental DNA
Schmidt et al. first reported environmental genomics by isolating and cloning environment DNA

2005 ★
NGS sequencer
First NGS sequencer released by Roche 454. Metagenomic study of human gut virome

1998
Metagenome
Handersman proposed the terms metagenomics

1991
EMP project
The Earth Microbiome Project (EMP) is an initiative founded

2024+
More expectations +

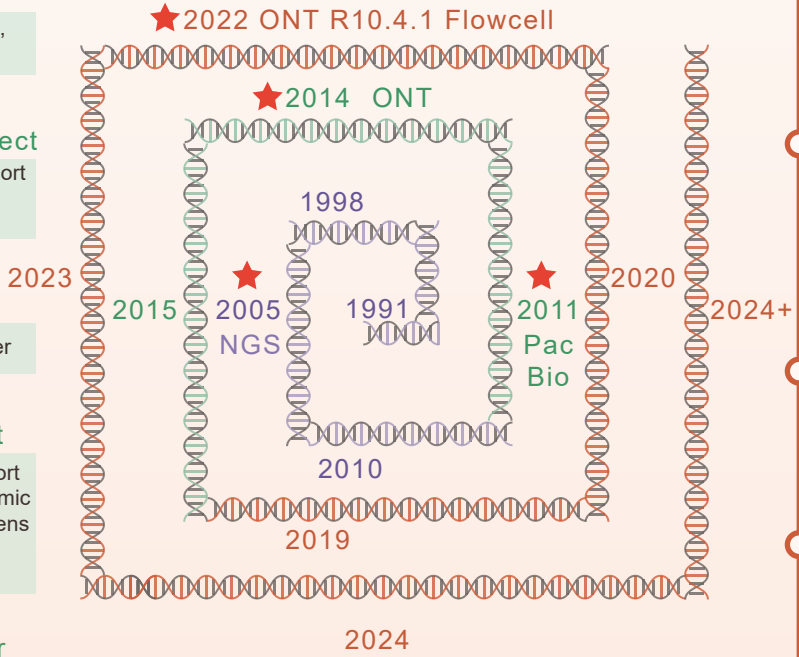
2011 ★
PacBio RS sequencer
PacBio RS sequencer was released, read length beyond 10 kb

2014
PacBio metagenome project
Wichmann et al. were the first to report the Exploring ARGs in dairy cow manure with PacBio RS sequencer

2014 ★
ONT MinION sequencer
ONT released the MinION sequencer

2015
ONT metagenome project
Greninger et al. were the first to report the utilization of real-time metagenomic detection for identifying viral pathogens in clinical specimens via MinION sequencing technology

2015
PacBio Sequel sequencer
PacBio releases Sequel system, enhancing long-read metagenomic studies



Big deals in metagenome studies

2024
CycloneSEQ in Metagenomics
The latest Chinese nanopore sequencer, CycloneSEQ, applied to metagenomic sequencing

2024
BASALT Long-read binners
BASALT (Binning Across a Series of Assembly Toolkit) released, which can binning and optimize short- or long-read metagenomic

2023
metaSVs tool
metaSVs (A pipeline combining long- and short-read to analyze structural variants in metagenomes) released

2023
Long-read metagenomics ——a new milestone
Comment "Long-read metagenomics paves the way toward a complete microbial tree of life" was publish in Nature Method

2019
ONT Flongle, PromethION sequencer
ONT released Flongle (small-scale sequencing applications) and PromethION(high throughput long-read sequencing. the R9.4.1 flowcell achive average accuracy of 92%

2020
metaFlye assembler
The long-read metagenomic assembly software “metaFlye” was published in Nature Methods

2022
PacBio Revio sequencer hifiasm-meta assembler
Pacbio Revio upgrade increases throughput and guarantees that Hifi reads attain a accuracy surpass Q30. Then “hifiasm-meta” was published in Nature Method

2022 ★
ONT R10.4.1 Flowcell Q20 chemistry
Nanopore released Q20 chemistry and R10.4.1 flowcell. Long-read only metagenomics allows high quality genome reconstruction without illumina correction