illumina®

BaseSpace[™] Analysis Environment

Next-generation sequencing cloud computing for biologists.

BaseSpace Highlights

- Streamlined Data Analysis
 Push-button analysis tools to quickly and easily view
 results without dedicated bioinformatics resources
- Unprecedented Access and Archive
 Seamless transfer of data from instrument to the cloud,
 instantly share data with collaborators, and store limitless data
- Enhanced Security Industry-standard encryption for security assurance

Introduction

One of the biggest challenges with next-generation sequencing (NGS) systems has been the requirement for a high-performance compute infrastructure to support data analysis and storage. With BaseSpace, you can eliminate the costs associated with maintaining an information technology (IT) infrastructure, freeing you to focus on your research. BaseSpace is the first cloud computing platform designed for biologists. With its user-friendly features (Figure 1) and direct integration with the MiSeq[™] system and other Illumina sequencing platforms, BaseSpace is the ideal cloud solution for data analysis, storage, and sharing.

Figure 1: BaseSpace Dashboard

Biologist-Friendly Bioinformatics

Designed with the biologist in mind, BaseSpace push-button bioinformatics applications are simple to use and produce biologically relevant and actionable results from raw data. BaseSpace output files are industry standards, and use open formats such as bam (mapped and aligned), vcf (variants called), fastq (raw reads), and text formats. With these file formats, you can easily import BaseSpace data into your favorite scientific software tools for further analysis.

Streamlined Data Analysis

Labs pursuing next-generation sequencing traditionally required the services of a highly trained bioinformatician to perform data analysis. BaseSpace helps automate bioinformatic analysis using cloud-based software applications. BaseSpace currently offers six separate data analysis applications: resequencing, amplicon resequencing, 16S metagenomics, *de novo* assembly (powered by Velvet), small RNA, and library QC. Using the Illumina Experiment Manager, the desired analysis is selected during sample sheet setup, and data is streamed directly to BaseSpace as the run commences. Upon completion of the sequencing run, BaseSpace automatically initiates the selected analysis without user intervention. The analysis is completed in



A. Latest Runs panel provides a quick glance at the status of runs uploaded from your MiSeq system or runs shared by another BaseSpace user.

- B. **Most Used** panel are runs prioritized based on the access frequency.
- C. Shared Data panel includes data that has been either shared with another user, or data that has been shared with you from another user.



a few hours and a report is automatically generated. Additionally, Illumina will keep adding applications developed in-house and by the bioinformatics community. This will further expand the options for simple, custom data analysis.

Unprecedented Access

BaseSpace is the first cloud platform to be directly integrated into the industry's leading sequencing platforms, with no cumbersome and time consuming data transfer steps (Figure 2). In the MiSeq® Control Software (MCS), simply select the option to use BaseSpace for storage and analysis when starting a sequencing run. The MiSeq instrument seamlessly pushes data to BaseSpace for automatic analysis and storage, with the option of retaining data for local hosting and analysis on the instrument. There is no need for a manual and time-consuming data transfer step. The data is already up in the cloud, for you and your collaborators to access anywhere, anytime.

Sharing		×
*	Share by Link	>
ALL	Share by Name	>
		Close
< Back to	Sharing	×
Share by	Link	
Give this link	to anyone to allow access to the data	
Grab this	Link	
http://bases;	ace.illumina.com/s/jd4Hgt	
		Close
Accept a	Share	2
Ying Wel war The experime	nts to share a run with you. nt name is 1x36+6 Validation smRNA	10pM.
	Reject	Accept

Data Collaboration on a Global Scale

data owners to monitor and control who is viewing their data.

With your raw and summarized data in the cloud, BaseSpace users can instantly share data with collaborators across the hallway or across the globe. Sharing data with other BaseSpace users is simple and straightforward (Figure 3). There are two options: Sharing by Link and Sharing by Name. Sharing by Link allows the data owner to create a unique link to pass to collaborators. Data owners can remove this link, and who has clicked on the link and viewed the data. Sharing by Name will be a more configurable method that gives data owners control over who is allowed access by simply managing a list of user emails.

Enhanced Security

Security is of paramount importance when making the decision to move genomic data to cloud-based analysis and storage. Your data is protected through a number of physical, electronic, and administrative measures. Data for upload are encrypted using the AES256 standard and protected by SSL. Your data within BaseSpace is hosted on Amazon Web Services (AWS), which is compliant with a wide variety of industry-accepted security standards¹. Amazon's comprehensive and industry tested approach to platform security ensures that BaseSpace meets or exceeds the security demands of most institutional infrastructures.

Get Started Today

Go to basespace.illumina.com to sign up for your free BaseSpace account.

References

1. http://aws.amazon.com/security

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