

Aug 16, 2023

Version 9

## NCBI submission protocol for microbial pathogen surveillance V.9

DOI

<https://dx.doi.org/10.17504/protocols.io.4r3l284pq1y/v9>



Ruth Timme<sup>1</sup>, Julie Haendiges<sup>1</sup>, Tina.Pfefer<sup>2</sup>, Errol Strain<sup>2</sup>, Maria Balkey<sup>3</sup>

<sup>1</sup>US Food and Drug Administration;

<sup>2</sup>Center for Veterinary Medicine, U.S. Food and Drug Administration, College Park, Maryland, USA;

<sup>3</sup>Center for Food Safety and Applied Nutrition, U.S. Food and Drug Administration, College Park, Maryland, USA

GenomeTrakr

Tech. support email: [genomeTrakr@fda.hhs.gov](mailto:genomeTrakr@fda.hhs.gov)



**Ruth Timme**

US Food and Drug Administration

### Create & collaborate more with a free account

Edit and publish protocols, collaborate in communities, share insights through comments, and track progress with run records.

Create free account

OPEN  ACCESS



**DOI:** <https://dx.doi.org/10.17504/protocols.io.4r3l284pq1y/v9>



**Protocol Citation:** Ruth Timme, Julie Haendiges, Tina.Pfefer , Errol Strain, Maria Balkey 2023. NCBI submission protocol for microbial pathogen surveillance. **protocols.io** <https://dx.doi.org/10.17504/protocols.io.4r3l284pq1y/v9>Version created by **Ruth Timme**

**Manuscript citation:**

Timme, Ruth E., William J. Wolfgang, Maria Balkey, Sai Laxmi Gubbala Venkata, Robyn Randolph, Marc Allard, and Errol Strain. "Optimizing Open Data to Support One Health: Best Practices to Ensure Interoperability of Genomic Data from Bacterial Pathogens." One Health Outlook 2, no. 1 (October 19, 2020): 20. <https://doi.org/10.1186/s42522-020-00026-3>.

**License:** This is an open access protocol distributed under the terms of the **[Creative Commons Attribution License](#)**, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited

**Protocol status:** Working

**We use this protocol and it's working**

**Created:** August 16, 2023

**Last Modified:** August 16, 2023

**Protocol Integer ID:** 86558

**Keywords:** NCBI submission, WGS, pathogen surveillance, GenomeTrakr, submission protocol for microbial pathogen surveillance purpose, new ncbi submission environment, pathogen whole genome sequence data to ncbi, ncbi submission environment, ncbi pathogen detection portal, ncbi pathogen detection, ncbi submission, submitting pathogen, ncbi submission portal change, first data submission, using ncbi, wgs data for bacterial pathogen, submitting raw read, microbial pathogen surveillance purpose, us laboratories in genometrakr, changes at ncbi, submission protocol, pathogens under surveillance, ncbi, raw reads to sra, submission portal, sample metadata to biosample, creating new bioproject, new bioproject, including pathogen, pathogen template, bacterial pathogen, new submitter, large volume submission, submitting wgs data, submission group, submission, whole genome sequence data, genometrakr, submitter, sample metadata, protocol, laboratory, other protocol, us laboratory

## Disclaimer

Please note that this protocol is public domain, which supersedes the CC-BY license default used by protocols.io.

## Abstract

**PURPOSE:** Step-by-step instructions for submitting pathogen whole genome sequence data to NCBI and to the NCBI Pathogen Detection portal. This protocol covers the steps needed to establish a new NCBI submission environment for your laboratory, including the creation of new BioProject(s) and submission groups. Once these are set up, the protocol then walks through the process for submitting raw reads to SRA and sample metadata to BioSample through the Submission portal.

**SCOPE:** for use by any laboratory submitting WGS data for bacterial pathogens, including pathogens under surveillance at NCBI Pathogen Detection. (This includes US laboratories in GenomeTrakr, NARMS, Vet-LIRN, PulseNet, and other non-US networks and submitters).

For new submitters, there's quite a bit of groundwork that needs to be established before a laboratory can start its first data submission. We recommend that one person in the laboratory take a few days to get everything set up in advance of when you expect to do your first data submission.

If you need a pipeline for frequent or large volume submissions, follow Step 1 to get your NCBI submission environment established, then contact [gb-admin@ncbi.nlm.nih.gov](mailto:gb-admin@ncbi.nlm.nih.gov) to set up an account for submitting through the API.

This protocol covers submissions using **NCBI's Submission Portal web-interface**.

### Version history:

**V9:** Updated external protocol links and modified Step 2.5 to reflect the option to choose the most appropriate metadata package.

**V8:** Corrected the multi-species umbrella project accession in Step 1.5

**V7:** Updated guidance for creating new BioProjects, including projects for non-targeted species

**V6:** minor edits including updating links out to other protocols.

**V5:** Linking directly to the metadata template guidance instead of including duplicate copies of the files in this protocol. Updated screenshot for choosing the pathogen template to reflect changes at NCBI.

**V4:** updated screenshots to reflect NCBI submission portal changes. Updated custom BioSample template.



## Before start

**This protocol has three sections:**

- **Section 1:** Setting up NCBI accounts (for new users)
- **Section 2:** Single-step data submission to SRA for raw reads and associated sequence metadata and to BioSample for sample metadata
- **Section 3:** Detailed steps for creating a BioProject (usually done once during the account set-up)

Associated protocols:

- [Guidance for populating GenomeTrakr metadata templates \(BioSample and SRA\)](#)
- [NCBI Data Curation protocol](#) for making updates, corrections, or retractions to your data.

## Establish submission environment at NCBI

### 1 Set up a new NCBI submission environment for your lab:

**1.1:** Create an NCBI user account

**1.2:** Set up an NCBI submission user group for your lab

**1.4:** Bookmark the link to your submission portal

**1.5.** Identify or establish new BioProjects (detailed in **Step 3**)

#### Ready for data submission:

After these steps are complete you can proceed with data submission in **Step 2**.

- 1.1 **Create an NCBI user account** at NCBI: <https://www.ncbi.nlm.nih.gov/account>. This will be your own individual user account at NCBI.



The screenshot shows the NCBI 'Sign in to NCBI' page. At the top, there are links for 'Resources' and 'How To'. The main heading is 'Sign in to NCBI'. Below this, there is a 'Sign in with' section with buttons for Google, NIH Login, and ORCID Commons. A link 'See more 3rd party sign in options' is also present. Below this is an 'OR' separator. The 'Sign in directly to NCBI' section contains a 'NCBI Username' input field, a 'Password' input field, a checked 'Keep me signed in' checkbox, and a 'Sign in' button. Below the 'Sign in' button are two links: 'Forgot NCBI username or password?' and 'Register for an NCBI account'. A red arrow points to the 'Register for an NCBI account' link.

\*\*\*NCBI login changes updated in June, 2021. [Read more here.](#)

## 1.2 Establish an NCBI submission user group for your laboratory.

We recommend using this user group for all NCBI submissions related to microbial genome surveillance. This will link your laboratory's NCBI data ownership to the *user group* and not to individuals, allowing anyone in the current group to perform updates or retractions and answer inquiries from the NCBI staff, even if there's been a complete turnover of staff since the original data submission.

User groups also ensure consistent data ownership across BioProjects, BioSamples, and sequence data. If your laboratory has non-overlapping research groups submitting and managing data at NCBI, multiple user groups can be established to track these efforts separately.

Your laboratory might already have a submission group established! Check the "Group" tab in the submission portal, <https://submit.ncbi.nlm.nih.gov/groups/>. Ask your colleagues to do the same thing, to ensure your laboratory doesn't already have one in place.

# Submission Portal

## Groups

| Group Id                | Full name                                                        | Aliases   |
|-------------------------|------------------------------------------------------------------|-----------|
| <a href="#">fda</a>     | <a href="#">FDA Center for Food Safety and Applied Nutrition</a> | FDA/CFSAN |
| <a href="#">fda_ny</a>  | FDA/CFSAN/NY_State                                               |           |
| <a href="#">fda_mdh</a> | FDA/CFSAN/MDH                                                    |           |

### Creating a new submission group:

1. Submit an email request to [submit-help@ncbi.nlm.nih.gov](mailto:submit-help@ncbi.nlm.nih.gov) containing the following information:

**Note**

*Dear NCBI help staff,*

*Please establish a new user group for my laboratory.  
I'm including the following information to help set up the group:*

*Short name of the group (abbreviation, e.g. "fda\_ny")*

*Full name of the group (e.g. "NY Wadsworth microbial pathogen submission group")*

*Contact email(s) to start the group*

*Institution and department or group*

*Physical address including country*

*Primary contact person, first and last name plus email.*

*\* if you have existing submissions you want to be converted, please request the ownership change in this email.*

*i.e., Please assign this new user group to the following BioProjects and linked data.*

*Thank you*

2. Look for an email reply entitled "NCBI Submission Portal Group invitation" and click on the enclosed link to accept the invitation.

### 1.3 **Managing your NCBI submission user group.**

After a user group has been established it can be edited for membership and permissions by clicking in the "group" tab of the submission portal (<https://submit.ncbi.nlm.nih.gov/groups/>), then on the Group Id hyperlink, e.g 'fda\_ny' in the above example.

Users with admin privileges can update contact information in the "profile" tab and membership in the "Members" tab. New members can be invited by clicking on the "Invite members" link.

## Submission Portal

Home My submissions Manage data **Groups** Templates My profile

Groups: **fda\_ny**

Profile **Members** Invites

[Invite members](#)

**Search**

**Save Permissions Changes**

| Username     | First name | Last name | Email      | Receives email notifications        | Read                                | Modify                              | Submit                              | Delete                              | Admin                               | Remove member          |
|--------------|------------|-----------|------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|------------------------|
| klimke       | Bill       | Klimke    | [REDACTED] | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <a href="#">Remove</a> |
| retimme      | Ruth       | Timme     | [REDACTED] | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <a href="#">Remove</a> |
| justin.payne | Justin     | Payne     | [REDACTED] | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <a href="#">Remove</a> |
| wwolfgang    | William    | Wolfgang  | [REDACTED] | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <a href="#">Remove</a> |
| samwirth     | PulseNet   | PulseNet  | [REDACTED] | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <a href="#">Remove</a> |
| slg04        | Sai        | Gubbala   | [REDACTED] | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <a href="#">Remove</a> |

This user group should be kept up-to-date as members enter and leave the laboratory.

Permissions levels:

- **READ:** primarily for collaborators who can see the submissions, but not edit them.
- **MODIFY, SUBMIT, DELETE:** Permissions to submit, modify, or retract data (members usually have all or none of these permissions)
- **ADMIN:** Can invite or remove members of the submission group. Ensure that at least one (or more) members of your group have ADMIN privileges.

1.4 **Bookmark “my submissions”** at NCBI: <https://submit.ncbi.nlm.nih.gov/subs/>. This is the page where you view and track all of your past submissions.

If you see a blank page with a yellow box in the upper right corner saying “please login”, click this link and login using the credentials created in **Step 1.1**.



## 1.5 Identify or establish new BioProjects (Umbrella and/or Data BioProjects)

**Umbrella BioProjects.** If you are already part of a surveillance network, (e.g. GenomeTrakr, NARMS, Vet-LIRN, or PulseNet) you will create a new data project linked to an established umbrella BioProject. For reference, here is a list of the major Umbrella projects for GenomeTrakr and Vet-LIRN, organized by taxonomic classification. For species not included in this list, create a general non-targeted data BioProject for your lab linked to PRJNA593772 (our multi-species BioProject).

### GenomeTrakr Umbrella projects

(<https://www.ncbi.nlm.nih.gov/bioproject/PRJNA593772>):

- |                                      |             |
|--------------------------------------|-------------|
| ▪ <i>Salmonella sp.</i>              | PRJNA183844 |
| ▪ <i>Listeria sp.</i>                | PRJNA514048 |
| ▪ <i>Escherichia coli / Shigella</i> | PRJNA230919 |
| ▪ <i>Vibrio parahaemolyticus</i>     | PRJNA245885 |
| ▪ <i>Campylobacter sp.</i>           | PRJNA258021 |
| ▪ <i>Clostridium botulinum</i>       | PRJNA290488 |
| ▪ <i>Cronobacter sp.</i>             | PRJNA258402 |
| ▪ All other species                  | PRJNA706684 |

### Vet-LIRN Umbrella projects:

- |                                               |             |
|-----------------------------------------------|-------------|
| ▪ <i>Salmonella enterica</i>                  | PRJNA314607 |
| ▪ <i>Escherichia coli</i> and <i>Shigella</i> | PRJNA316449 |
| ▪ <i>Staphylococcus</i>                       | PRJNA316451 |



If you need to establish a new umbrella BioProject, follow instructions in **Step 3** with modifications for creating a new Umbrella BioProject (**Step 3.12**).

**Data BioProjects.** Does your laboratory have an established data BioProject for this effort? If not please follow the instructions in **Step 3** for creating a new one.

#### Note

#### More information:

Learn more about **data** vs **umbrella** BioProjects in Step 3

## Data submission (BioSample and SRA)

### 2 Data submission (source metadata and sequence data):

This protocol follows a one-step data submission process where the source metadata is submitted through the same submission workflow as the sequence data.

**\*\*Before submission**, ensure that your sequences meet the quality control (QC) thresholds for your surveillance network. You can follow your own internal QC process or use FDA's free GalaxyTrakr platform:

#### Protocol



NAME

Quality control assessment for microbial genomes:  
GalaxyTrakr MicroRunQC workflow

CREATED BY

Ruth Timme

Preview

Navigate to the My Submissions page in the NCBI Submission Portal:

<https://submit.ncbi.nlm.nih.gov/subs/>

## Submission Portal

Home **My submissions** Manage data Groups Templates My profile

### Your submissions

#### Start a new submission

- GenBank
- **Sequence Read Archive**
- Genome
- TSA
- BioProject
- BioSample
- Supplementary Files
- API

#### Filter / Search

From date: YYYY-MM-DD To date: YYYY-MM-DD Status: Not deleted Sort by: ☐ desc

Apps: + Data archives: +

Query:  Search Clear

104,089 submissions

← previous 1 2 3 4 5 6 7 8 9 ... 4,161 4,162 4,163 4,164 next →

| Submission | Title                                                                                                         | App                         | Group            | Status                                                                                                         | Updated |
|------------|---------------------------------------------------------------------------------------------------------------|-----------------------------|------------------|----------------------------------------------------------------------------------------------------------------|---------|
| SUB8323567 | GenomeTrakr Project: Listeria monocytogenes New York State Department of Health, Wadsworth Center, Oct 15 '20 | Sequence Read Archive (SRA) | nys_gt           | Submitted<br>Awaiting processing.                                                                              | 10:25   |
| SUB8308472 | Pathogen: environmental/food/other sample                                                                     | BioSample                   | nc_thakur_lab_gt | BioSample: Processed<br>Successfully loaded (24 objects)<br>Download attributes file with BioSample accessions | Oct 14  |
| SUB8322783 | UI-less submission 2020-10-14                                                                                 | API                         | fda              | SRA: Processing                                                                                                | Oct 14  |
| SUB8322788 | UI-less submission 2020-10-14                                                                                 | API                         | fda              | SRA: Processing                                                                                                | Oct 14  |

Click "Sequence Read Archive" to start a submission.

## 2.1 Download and populate the sample (BioSample) and sequence (SRA) metadata templates:

Custom metadata templates and guidance are available in the following protocol:

### Protocol



NAME

### Guidance for populating GenomeTrakr metadata templates (BioSample and SRA)

CREATED BY

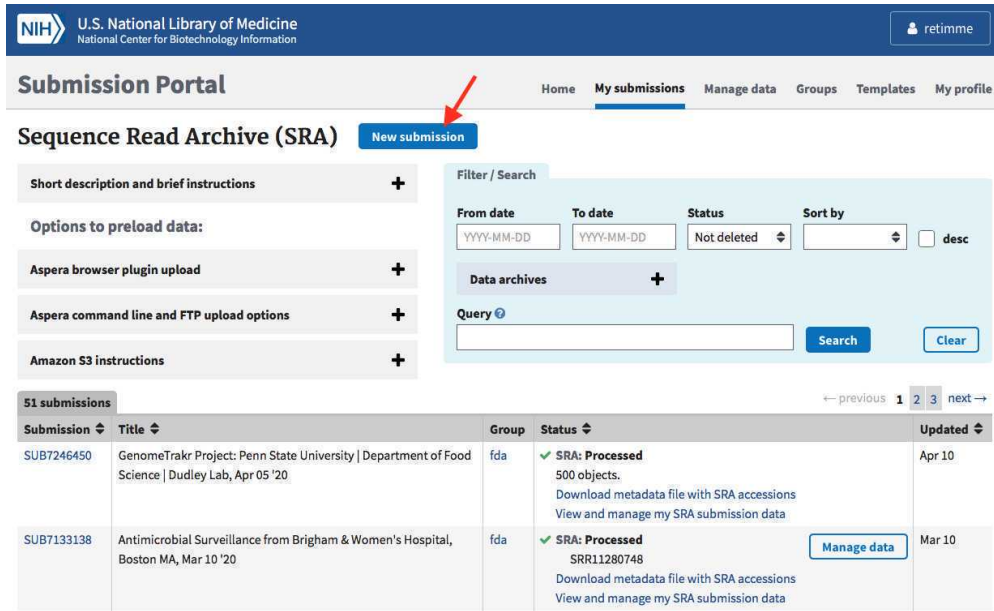
Ruth Timme

Preview

### Note

Organize submissions by BioProject, only submitting to a single BioProject per submission workflow. Populate the metadata spreadsheets for each isolate you intend to submit (you can submit metadata for a single isolate or a collection of isolates under a single BioProject).

## 2.2 Click the “New submission” box.



The screenshot shows the NIH Submission Portal interface. At the top, there's a navigation bar with the NIH logo and the text 'U.S. National Library of Medicine National Center for Biotechnology Information'. Below this is a 'Submission Portal' header with a 'New submission' button highlighted by a red arrow. The main content area is divided into two columns. The left column contains links for 'Short description and brief instructions', 'Options to preload data', 'Aspera browser plugin upload', 'Aspera command line and FTP upload options', and 'Amazon S3 instructions'. The right column contains a 'Filter / Search' section with fields for 'From date', 'To date', 'Status', and 'Sort by', along with a 'Data archives' section and a 'Query' search bar. Below these sections is a table of submissions.

| Submission | Title                                                                                            | Group | Status                                                                                                                   | Updated |
|------------|--------------------------------------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------|---------|
| SUB7246450 | GenomeTrakr Project: Penn State University   Department of Food Science   Dudley Lab, Apr 05 '20 | fda   | ✓ SRA: Processed<br>500 objects.<br>Download metadata file with SRA accessions<br>View and manage my SRA submission data | Apr 10  |
| SUB7133138 | Antimicrobial Surveillance from Brigham & Women's Hospital, Boston MA, Mar 10 '20                | fda   | ✓ SRA: Processed<br>SRR11280748<br>Download metadata file with SRA accessions<br>View and manage my SRA submission data  | Mar 10  |

## 2.3 SUBMITTER tab:

Populate with submitter info. The “submitter” is the name of the person, or user group, who is physically doing the submissions, not a supervisor or PI.

Select the appropriate submission group name (see **Step 1.2** for creating a new submission group), and describe the submitting organization or laboratory name. This will be auto-populated from the contact info you included in your NCBI user account. Click "Continue" to proceed.

**Sequence Read Archive (SRA) submission: SUB9477908**

GenomeTrakr Project: US Food and Drug Administration, Apr 14 '21

**1 SUBMITTER** 2 GENERAL INFO 3 BIOSAMPLE TYPE 4 BIOSAMPLE ATTRIBUTES 5 SRA METADATA 6 FILES 7 REVIEW & SUBMIT**Submitter**

|                                                     |                      |                                                |
|-----------------------------------------------------|----------------------|------------------------------------------------|
| ★ First (given) name                                | Middle name          | ★ Last (family) name                           |
| <input type="text" value="Ruth"/>                   | <input type="text"/> | <input type="text" value="Timme"/>             |
| ★ Email (primary)                                   |                      | Email (secondary)                              |
| <input type="text" value="ruth.timme@fda.hhs.gov"/> |                      | <input type="text" value="retimme@gmail.com"/> |

At least one email should be from the organization's domain.

**Group for this submission**

☐ No group (affiliation from my personal profile)

☒ **13 members** FDA Center for Food Safety and Applied Nutrition ([edit group](#))

Anjanette Johnston, Yan Luo, Errol Strain, Justin Payne, Narjol Gonzalez-Escalona, Hugh Rand, Maria Balkey, fda service, Maria Hoffmann, Jayanthi Gangiredla, Julie Haendiges, Yu Wang, you

**2.4 GENERAL INFO tab:**

**1. BioProject:** Did you already have a data BioProject for this effort? If not please follow instructions in **Step 3** for creating a new data or umbrella BioProject. Return back to this sub-step with the **data BioProject** accession in hand.

Click "**Yes**" and paste in your data BioProject accession, e.g. PRJNA614995.

**Sequence Read Archive (SRA) submission: SUB9477908**

GenomeTrakr Project: US Food and Drug Administration, Apr 14 '21

**1 SUBMITTER** 2 GENERAL INFO 3 BIOSAMPLE TYPE 4 BIOSAMPLE ATTRIBUTES 5 SRA METADATA 6 FILES 7 REVIEW & SUBMIT**General Information****BioProject**

BioProject describes the goal of your research effort.

★ Did you already register a BioProject for this research, e.g. for the submission of the reads to SRA and/or of the genome to GenBank?

☒ Yes ☐ No

★ Existing BioProject

**BioSample**

The BioSample records the detailed biological and physical properties of the sample that was sequenced. A BioSample can be used in more than one BioProject since it should be used for all the data that were obtained from that sample. Usually SRA data sets are generated from more than one sample.

★ Did you already register a BioSample for this sample, e.g. for the submission of the reads to SRA and/or of the genome to GenBank?

☐ Yes ☒ No**Release date**

Note: Release of BioProject or BioSample is also triggered by the release of linked data.

★ When should this submission be released to the public?

☒ Release immediately following processing  
☐ Release on specified date or upon publication, whichever is first

Please allow 24-48 hours for propagation of the data to the NCBI SRA public site.

**Continue**

**2. BioSample:** Click "NO" here. You will be registering BioSamples within this current submission

**3. Release date:** Choose "Release immediately following processing".

4. Click **Continue**.

## 2.5 BIOSAMPLE TYPE tab:

Choose the appropriate metadata package here for your sample (which sample template did you populate?)



The most common choices for enteric surveillance:

- **"Pathogen"**, then **"Pathogen:environmental/food/other"**
- **"One Health Enteric"** (custom templates for US public health submitters available [here](#))

[All packages](#) [Packages for MAG submitters](#) [Packages for metagenome submitters](#)

**(Optional) Filter packages by organism name**  
 [Reset and show all packages](#)

📘 To filter for relevant BioSample packages, enter the **full scientific name** of the organism of your samples.

- If your BioSamples are derived from a species **not represented in NCBI's Taxonomy database**, enter the genus-level name, e.g., *Escherichia*
- If your BioSamples are derived from **more than one organism**, enter the common species, genus, or family, e.g., *Enterobacteriaceae*
- If your BioSamples are **metagenomic/environmental**, or **metagenome-assembled genomes (MAG)**, select the appropriate tab above
- For more information about organism names, see [Organism information](#).

**NCBI packages** [More...](#)

☐ **SARS-CoV-2: clinical or host-associated**  
Use for SARS-CoV-2 samples that are relevant to public health. Required attributes include those considered useful for the rapid analysis and trace back of SARS-CoV-2 cases.

☐ **SARS-CoV-2: wastewater surveillance**  
Use for SARS-CoV-2 wastewater surveillance samples that are relevant to public health. Required attributes include those considered useful for the rapid analysis and trace back of SARS-CoV-2 cases.

 ☐ **Pathogen**  
Use for pathogen samples that are relevant to public health. Required attributes include those considered useful for the rapid analysis and trace back of pathogens.

 ☐ **One Health Enteric**  
Use for microbial samples that are collected for genomic surveillance of enteric pathogens by US Health agencies. Includes the [One Health Enteric](#) sample spaces: 1. human/animal hosts; 2. food samples; 3. food facilities; 4. environmental samples (farm, water, and the environment).

☐ **Microbe**  
Use for bacteria or other unicellular microbes when it is not appropriate or advantageous to use [MixS](#), Pathogen or Virus packages.

☐ **Model organism or animal**  
Use for multicellular samples or cell lines derived from common laboratory model organisms, e.g., mouse, rat, Drosophila, worm, fish, frog, or large mammals including zoo and farm animals.

☐ **Metagenome or environmental**  
Use for metagenomic and environmental samples when it is not appropriate or advantageous to use [MixS](#) packages.

**GSC [MixS](#) packages for genomes, metagenomes, and marker sequences** [More...](#)

☐ **MIGS Cultured Bacterial/Archaeal**  
Use for cultured bacterial or archaeal genomic sequences. Organism must have lineage [Bacteria](#) or [Archaea](#).

☐ **MIGS Eukaryotic**  
Use for eukaryotic genomic sequences. Organism must have lineage [Eukaryota](#).

☐ **MIGS Viral**  
Use for virus genomic sequences. Organism must have lineage [Viruses](#).

☐ **MIMAG Metagenome-assembled Genome**  
Use for metagenome-assembled genome sequences produced using computational binning tools that group sequences into individual organism genome assemblies starting from metagenomic data sets. Organism cannot contain the term 'metagenome'. Use the MIUVIG package for virus genomes. Before creating BioSamples for prokaryotic and eukaryotic MAGs, please read and follow the [MAG submission instructions](#).

☐ **MIMARKS Specimen**  
Use for any type of marker gene sequences, eg, 16S, 18S, 23S, 28S rRNA or COI obtained from cultured or voucher-identifiable specimens. Organism cannot contain the term 'metagenome'.

☐ **MIMARKS Survey related**  
Use for any type of marker gene sequences, eg, 16S, 18S, 23S, 28S rRNA or COI obtained directly from the environment, without culturing or identification of the organisms. Organism must be a metagenome, where lineage starts with [unclassified sequences](#) and scientific name ends with 'metagenome'.

☐ **MIMS Environmental/Metagenome**  
Use for environmental and metagenome sequences. Organism must be a metagenome, where lineage starts with [unclassified sequences](#) and scientific name ends with 'metagenome'.

## 2.6 BIOSAMPLE ATTRIBUTES tab:

Choose "Upload a file using Excel or text format (tab-delimited) that includes the attributes for each of your BioSamples".

Then click "Choose File" and browse to your populated metadata template.

### Note

If you have not yet populated your GenomeTrakr BioSample metadata template, see **Step 2.1**.

## Sequence Read Archive (SRA) submission: SUB9477908

GenomeTrakr Project: US Food and Drug Administration, Apr 14 '21

1 SUBMITTER 2 GENERAL INFO 3 BIOSAMPLE TYPE 4 BIOSAMPLE ATTRIBUTES 5 SRA METADATA 6 FILES 7 REVIEW & SUBMIT

### Attributes

#### ★ How do you want to provide your BioSample attributes?

- ☐ Use built-in table editor
- ☒ Upload a file using Excel or text format (tab-delimited) that includes the attributes for each of your BioSamples

One Health Enteric Package v0.2.xlsx 32.5 kB 2021-04-14 16:57 [Delete](#)

Template for BioSample package **Pathogen: combined; version 1.0**

[Download Excel](#) [Download TSV](#)

For column explanations and examples, please see the [sample attributes page](#).

For more information, please see [creating sample attribute file](#).

#### Antibiogram — pathogen MIC (optional)

[Choose file](#) or drag and drop it here

[Download Antibiogram Excel template](#)

Once the spreadsheet is completed, save as a "Text (Tab-delimited)" file, and upload it.

For more information, please see [providing pathogen MIC antibiogram data](#).

#### Antibiogram — mycobacterial non-MIC (optional)

[Choose file](#) or drag and drop it here

[Download Antibiogram Excel template](#)

Once the spreadsheet is completed, save as a "Text (Tab-delimited)" file, and upload it.

For more information, please see [providing mycobacterial non-MIC antibiogram data](#).

[Continue](#)

**Antibiogram data:** please provide if you have it!

Click "**Continue**".



NCBI will do a validation check on your metadata. Resolve any red "errors" reported back by editing the spreadsheet and replacing the uploaded file. Review any yellow "Warnings" and proceed if everything looks ok.

Click "**Continue**".

## 2.7 SRA METADATA tab:

**Choose:** "Upload a file using Excel or text format (tab-delimited)".

### Sequence Read Archive (SRA) submission: SUB9477908

GenomeTrakr Project: US Food and Drug Administration, Apr 14 '21

1 SUBMITTER 2 GENERAL INFO 3 BIOSAMPLE TYPE 4 BIOSAMPLE ATTRIBUTES 5 SRA METADATA 6 FILES 7 REVIEW & SUBMIT

#### SRA metadata

For more detailed help with SRA submission please read the [SRA Submission Wizard Help](#).

★ How do you want to provide your metadata?

☐ Use built-in table editor

☒ Upload a file using Excel or text format (tab-delimited)

★ Metadata file

|                             |         |                  |        |
|-----------------------------|---------|------------------|--------|
| SRA_metadata-GTexample.xlsx | 53.7 kB | 2021-04-14 17:11 | Delete |
|-----------------------------|---------|------------------|--------|

Use one of these ways to fill out SRA metadata:  
Download Excel spreadsheet (designed to make it easier to select the correct metadata values), edit, save and then upload the modified Excel file.

Continue

Upload your populated **SRA metadata template** (see Step 2.1 for where to get this file)

Click "**Continue**".

NCBI will do a validation check on your sequence metadata. Resolve any red "errors" reported back by editing the spreadsheet and replacing the uploaded file. Review any yellow "Warnings" and proceed if everything looks ok.

Click "**Continue**".



## 2.8 Files tab:

Each laboratory will establish its own path for transferring files.

In general, selecting the web browser option should work for uploading ~48 sequences at a time. For a more stable internet connection, your laboratory can use FTP or Aspera. Directions for doing so pop up after clicking the FTP radio button.

- **Each file must be listed** in the [SRA metadata table you uploaded](#). If you are uploading a **tar** archive, list each file name, not the archive name.
- **Unique file names that do not contain any sensitive information** should be used for all files. File names as submitted appear publicly when data is retrieved from the cloud.
- Files can be compressed using **gzip** or **bzip2**, and may be submitted in a **tar** archive, but archiving or compressing your files is not required. **Do not use zip!**

★ **How do you want to provide files for this submission?**

- ☐ Web browser upload via HTTP or Aspera Connect plugin  
Do not use web browser HTTP upload if you are uploading files over 10 GB or more than 300 files.
- ☐ FTP or Aspera Command Line file preload  
All files for a submission must be uploaded into a single folder.
- ☐ Amazon S3 bucket

### Note

It is generally not recommended to check the Auto-submission box as this would not allow you to edit corrections if needed.

## 2.9 REVIEW & SUBMIT tab:

Check over your entire submission, then click submit.

If corrections are needed, you can go back and select individual tabs to edit your submission.

## Note

If you are having trouble finalizing your submission, contact the relevant NCBI database for assistance and include your submission ID in the email subject (SUB#####):

**BioSample** (for source metadata issues): biosamplehelp@ncbi.nlm.nih.gov

**SRA** (for raw sequence or sequence metadata issues): sra@ncbi.nlm.nih.gov

## 2.10 BioSample accessions:

BioSample accessions will be automatically created upon submission and will be available on the "my submissions" page of the Submission portal by clicking on "## objects" within the submission record. You can also download by clicking the "Download attributes file with BioSample accessions". Accessions will start with SAMNxxxxxxx. You will also receive an email within 12 hours, but typically much faster, containing these same accessions.

The screenshot displays the BioSample submission portal interface. At the top, there's a header with 'BioSample' and links for 'New submission' and 'Download batch submission template'. Below this is a note: 'Note: to update an existing record or resubmit submission, please post your record.' A section for 'Short description and brief instructions' is visible. On the right, there's a 'Filter / Search' panel with fields for 'From date', 'To date', 'Status' (set to 'Not started'), and 'Sort by'. Below this is a 'Data archives' section with a 'Query ID' field and 'Search' and 'Clear' buttons. The main content area shows a table of 'MY submissions' with columns for 'Submission ID', 'Title', 'Group', 'Status', and 'Updated'. The first submission is 'S08421776' with the title 'Pathogen environmental/food/water sample'. The 'Status' column shows 'BioSample Processed (3 responses)' and a list of 24 accession numbers (SAMN08421776.1 to SAMN08421776.24). The 'Updated' column shows 'Aug 20'.

## 2.11 SRA Accessions:

SRA run accessions will be available on the "my submissions" page of the Submission portal by clicking on "## objects" within the submission record. You can also download by clicking the "Download metadata file with SRA accession". Accessions will start with

SRRxxxxxxx." You will also receive an email with these same accessions within 24 hours, but typically much faster, containing these same accessions.

**NIH U.S. National Library of Medicine**  
National Center for Biotechnology Information

**Submission Portal**

Home My submissions Manage data Groups Templates My profile

**Sequence Read Archive (SRA)** [New submission](#)

Short description and brief instructions +

Options to preload data:

Aspera browser plugin upload +

Aspera command line and FTP upload options +

Amazon S3 instructions +

Filter / Search

From date To date Status Sort by

Not deleted desc

Data archives +

Query Search Clear

30 submissions

| Submission | Title                                                                                                   | Group  | Status                                                                                                                                                  | Updated |
|------------|---------------------------------------------------------------------------------------------------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| SUB5616822 | GenomeTrakr Project: US Food and Drug Administration, May 14 '19                                        | fda    | ✓ SRA: Processed<br>(2 objects)<br>• SRR9052981<br>• SRR9052982<br>Download metadata file with SRA accessions<br>View and manage my SRA submission data | May 14  |
| SUB5110190 | GenomeTrakr Project: Bacillus cereus, New York State Department of Health, Wadsworth Center, Jan 31 '19 | fda_ny | ✓ SRA: Processed<br>(6 objects)<br>Download metadata file with SRA accessions<br>View and manage my SRA submission data                                 | Jan 31  |
| SUB5106005 | GenomeTrakr Project: NY State Dept. of Health, Wadsworth Center, Jan 30 '19                             | fda_ny | ✓ SRA: Processed<br>(20 objects)<br>Download metadata file with SRA accessions<br>View and manage my SRA submission data                                | Jan 30  |

## 2.12 Important data stewardship and curation notes:

- Develop an internal method for storing and tracking your BioSample and SRA accessions! They are required for making future updates to your records.
- For updates, corrections, or retractions to your BioSample and SRA records, follow the guidance provided in the NCBI Curation Protocol. Some edits can be made within the submission portal and others need to be done via email.

### Protocol



NAME

**NCBI data curation protocol - SOP for editing GenomeTrakr submissions**

CREATED BY

Ruth Timme

Preview



### Safety information

**Caution:** It is possible for a single BioSample to have more than one SRR ID. Two scenarios include:

1. Two runs were submitted for the same isolate/BioSample, which is not generally recommended for surveillance. Follow **Step 3** in the NCBI curation protocol to retract one of them).
2. if the initial submission was retracted and new a new run was submitted. It's important to keep track of both IDs, even if one was retracted.

## BioProject Creation

### 3 Create a new BioProject

BioProjects are an organizing tool at NCBI that pulls together different kinds of data submitted across multiple NCBI databases. Each BioProject has a unique URL, providing a home page with a title, description, links to lab websites, publications, funding resources associated with a particular project, along with links to the deposited data. A basic **data BioProject** holds actual sequence data, assemblies, and their associated metadata. An **umbrella BioProject** is a way to group two or more data BioProjects together, which is useful for coordinating disease surveillance and for looking across the grouped BioProjects in a single view.

This protocol describes the steps for creating a new data BioProject linked to an existing umbrella BioProject (usually established by a coordinating group, e.g. GenomeTrakr, NARMS, Vet-LIRN).

\*If you need to create a new Umbrella BioProject, modifications are summarized in Step **3.12**.

#### 3.1

**Navigate to the "My Submissions" page, <https://submit.ncbi.nlm.nih.gov/subs/>, and click "BioProject" in the "Start a new submission" box.**

**NIH** U.S. National Library of Medicine  
National Center for Biotechnology Information

**Submission Portal**

Home **My submissions** Manage data Groups Templates My profile

**Your submissions**

**Start a new submission**

- GenBank
- BioProject**
- Sequence Read Archive
- BioSample
- Genome
- Supplementary Files
- TSA
- API

Filter / Search

From date To date Status Not deleted Sort by desc

Apps + Data archives +

Query Search Clear

96,398 submissions

| Submission | Title                         | App | Group | Status                                                                      | Updated |
|------------|-------------------------------|-----|-------|-----------------------------------------------------------------------------|---------|
| SUB6510311 | UI-less submission 2019-11-04 | API | fda   | ✓ BioSample: Processed<br>Successfully loaded<br>SAMN13192483 (TaxID: 1639) | 07:15   |

### 3.2 Click the "New submission" box:

**NIH** U.S. National Library of Medicine  
National Center for Biotechnology Information

**Submission Portal**

Home **My submissions** Manage data Groups Templates My profile

**BioProject** **New submission**

**ATTN:** to update an existing record or recent submission, please email your request with your BioProject ID or Submission ID included. Do not create new submission to update an existing submission!

Short description and brief instructions +

Filter / Search

From date To date Status Not deleted Sort by desc

Data archives +

Query Search Clear

187 submissions

| Submission | Title                                                    | Group | Status                                                                                                                                | Updated |
|------------|----------------------------------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------|---------|
| SUB8320199 | Listeria monocytogenes Database: isolates from FDA-CFSAN | fda   | ✓ BioProject: Processed<br>PRJNA215355 : Listeria monocytogenes Database: isolates from FDA-CFSAN (TaxID: 1639)<br>locustagprefix.txt | Nov 03  |

### 3.3 Submitter tab:

Populate with submitter info. An NCBI "submitter" is the name of the person or submission group who is managing the submissions, not a supervisor or PI.

Select the appropriate submission group name (see **Step 1.2** for creating a new submission group), and describe the submitting organization or laboratory name. This will be auto-populated from the contact info you included in your NCBI user account.

### 3.4 Project type tab:

Project data type: Genome sequencing and assembly.

Sample scope:

*For a **Data BioProject**:* select multi-species. This will allow you to submit multiple different species to the BioProject.

### 3.5 **Target tab:**

*For a **Data BioProject**:* Populate ONLY the Organism name here:

#### **For targeted-pathogen BioProjects:**

Organism name = Include a Genus name, e.g., *Salmonella sp.*

#### **For non-targeted pathogens**

Organism name = "bacteria"

Leave the strain info and Description fields blank.

### 3.6 **General info tab:**

Click "Release immediately following processing".

Include a brief title describing the effort.

- **Data BioProject Title:** e.g., "GenomeTrakr Project: NY State Dept. of Health, Wadsworth Center".

Public Description: e.g., "Whole-genome sequencing of pure-cultured microbial pathogens as part of XXXX surveillance effort."

Relevance: environmental.

Is your project part of a larger initiative that is already registered at NCBI?

- **Data BioProjects.** Click "Yes" and include a brief description and umbrella BioProject accession number (see **Step 1.5**). This will properly link your data project to the umbrella.



## BioProject submission: SUB12915263

FDA BioProject: bacterial pathogens



This submission was copied from SUB12914688.

**1 SUBMITTER** 2 PROJECT TYPE 3 TARGET 4 GENERAL INFO 5 BIOSAMPLE 6 PUBLICATIONS 7 REVIEW & SUBMIT

### General Info

#### Release date

**Note:** Release of BioProject or BioSample is also triggered by the release of linked data.

##### ★ When should this submission be released to the public?

- ☒ Release immediately following processing
- ☐ Release on specified date or upon publication, whichever is first

##### ★ Project title

FDA BioProject: bacterial pathogens

##### ★ Public description

Whole genome sequencing of pure-cultured bacterial pathogens for FDA surveillance and outbreak investigations.

##### Relevance

Environmental

##### ★ Is your project part of a larger initiative which is already registered with NCBI?

- ☐ No ☒ Yes (not very common)

##### ★ Initiative description

GenomeTrakr umbrella for diverse pathogen species

##### ★ BioProject accession

PRJNA706684

If you are registering a project that is part of an initiative which is already registered in the BioProject database, then please tell us the existing BioProject accession and provide a general description of the larger initiative. For example, the ENCODE project and Human Microbiome project have several subprojects. This information is needed for project linking.

### External links

#### Description

#### URL

Delete

[Add another link](#)

### Select your grants

Use this tool to look up grants from many subscribed governmental funding agencies (eg NIH, CDC, FDA and VA) and some non-governmental funding sources (eg HHMI). You can search by grant number, title or grantee name. If your grant is not included, you can select the 'Add grants manually' option within this tool to add your grant.

[Add grants](#)

#### Consortium name

#### Consortium URL

#### Data provider

#### Data provider URL

Delete

[Add another data provider](#)

### 3.7 **BioSample tab:**

Leave blank!! You will create biosamples separately.

### 3.8 **Publications tab:**

If relevant, include publications from your laboratory.

### 3.9 **Review and Submit tab:**

Check if everything looks correct and edit if necessary, then click **"submit."**

Submission Portal

BioProject submission: SUB12915263

FDA BioProject: bacterial pathogens

This submission was copied from SUB12914688.

1 SUBMITTER

2 PROJECT TYPE

3 TARGET

4 GENERAL INFO

5 BIOSAMPLE

6 PUBLICATIONS

7 REVIEW & SUBMIT

Review & Submit

This BioProject submission will be released **immediately following processing.**

Submitter

Submitter

Ruth Timme  
ruth.timme@fda.hhs.gov

Submitting organization

US Food and Drug Administration

Project type

Sample scope

Multispecies

Target description

Bacterial pathogens not included in the major taxa scoped for GenomeTrakr.

Target

Organism name (taxid)

bacterial pathogens

General information

Project details

Parent project ID

PRJNA706684

Parent project description

GenomeTrakr umbrella for diverse pathogen species

Project type

genome sequencing

Title

FDA BioProject: bacterial pathogens

Description

Whole genome sequencing of pure-cultured bacterial pathogens for FDA surveillance and outbreak investigations.

Relevance

Environmental

Example for a new non-targeted BioProject

3.10 **The BioProject accession** will be available within a few minutes on the "my submissions" page of the Submission portal, "PRJNAxxxxxx." You will also receive an email containing the new accession.

protocols.io | <https://dx.doi.org/10.17504/protocols.io.4r3l284pgl1y/v9>

August 16, 2023

25/28



The screenshot shows the NIH Submission Portal interface. At the top, there's a navigation bar with 'Home', 'My submissions', 'Manage data', 'Groups', 'Templates', and 'My profile'. Below this, the 'Your submissions' section includes a 'Start a new submission' button and a list of submission types: GenBank, Sequence Read Archive, Genome, TSA, BioProject, BioSample, and Supplementary Files. A filter/search bar is on the right, with fields for 'From date', 'To date', 'Status' (set to 'Not deleted'), and 'Sort by' (set to 'desc'). Below the filter bar, there's a table of submissions. The first submission is 'SUB001134' with the title 'GenomeTrakr Project: Minnesota Department of Health'. It has a status of 'BioProject: Processed' and a 'Data archives' link. A red arrow points to the 'Data archives' link.

- 3.11 If you are part of a coordinated surveillance effort, like GenomeTrakr, please alert the coordinating body that a new BioProject was created under an existing umbrella.

For GenomeTrakr, contact [genomeTrakr@fda.hhs.gov](mailto:genomeTrakr@fda.hhs.gov)

### 3.12 Creating a new Umbrella BioProject:

Proceed as outlined in the above steps with the following modifications:

#### PROJECT TYPE tab:

For an ***Umbrella BioProject***: select multi-species. This will allow you to link multiple data BioProjects representing different species under a single umbrella.

-----

#### TARGET tab:

For an ***Umbrella BioProject***: Leave the Organism name field blank. Include a list or description of species you intend to include in this effort. E.g. "bacterial foodborne pathogens", or "SARS-Cov-2"

-----

#### GENERAL INFO tab:

***Umbrella BioProject*** Title: e.g. "Microbial pathogen surveillance at NY State Dept. of Health, Wadsworth Center."

Is your project part of a larger initiative that is already registered at NCBI?

- For an Umbrella BioProject: click "NO"



-----

The last step is to email [bioprojecthelp@ncbi.nlm.nih.gov](mailto:bioprojecthelp@ncbi.nlm.nih.gov):

Example email:

**Note**

"Dear BioProject and PD help teams,

Please convert the PRJNA##### to an Umbrella BioProject. Our laboratory will be submitting data under the XXX effort (SARS-CoV-2, GenomeTrakr, Vet-LIRN, NARMS, HAI, or more general pathogen surveillance).

I'd be happy to provide any additional details you might need.

Thank you,"

After the conversion is complete you can use the new Umbrella accession to properly link any new data BioProjects being created.

### 3.13 Important data stewardship and curation notes:

- Develop an internal method for storing and tracking your BioProject accessions! They are required for every BioSample and sequence data submission to ensure proper linkage.
- Bookmark URLs for each of your data BioProjects to monitor the public-facing view of your submissions.  
e.g. Virginia DCLS's GenomeTrakr *Salmonella* BP:  
<https://www.ncbi.nlm.nih.gov/bioproject/219491>
- For updates to your BioProjects, follow the guidance provided in the NCBI Curation Protocol. Some edits can be made within the submission portal and others need to be done via email.



## Protocol



NAME

**NCBI data curation protocol - SOP for editing GenomeTrakr submissions**

CREATED BY

Ruth Timme

Preview