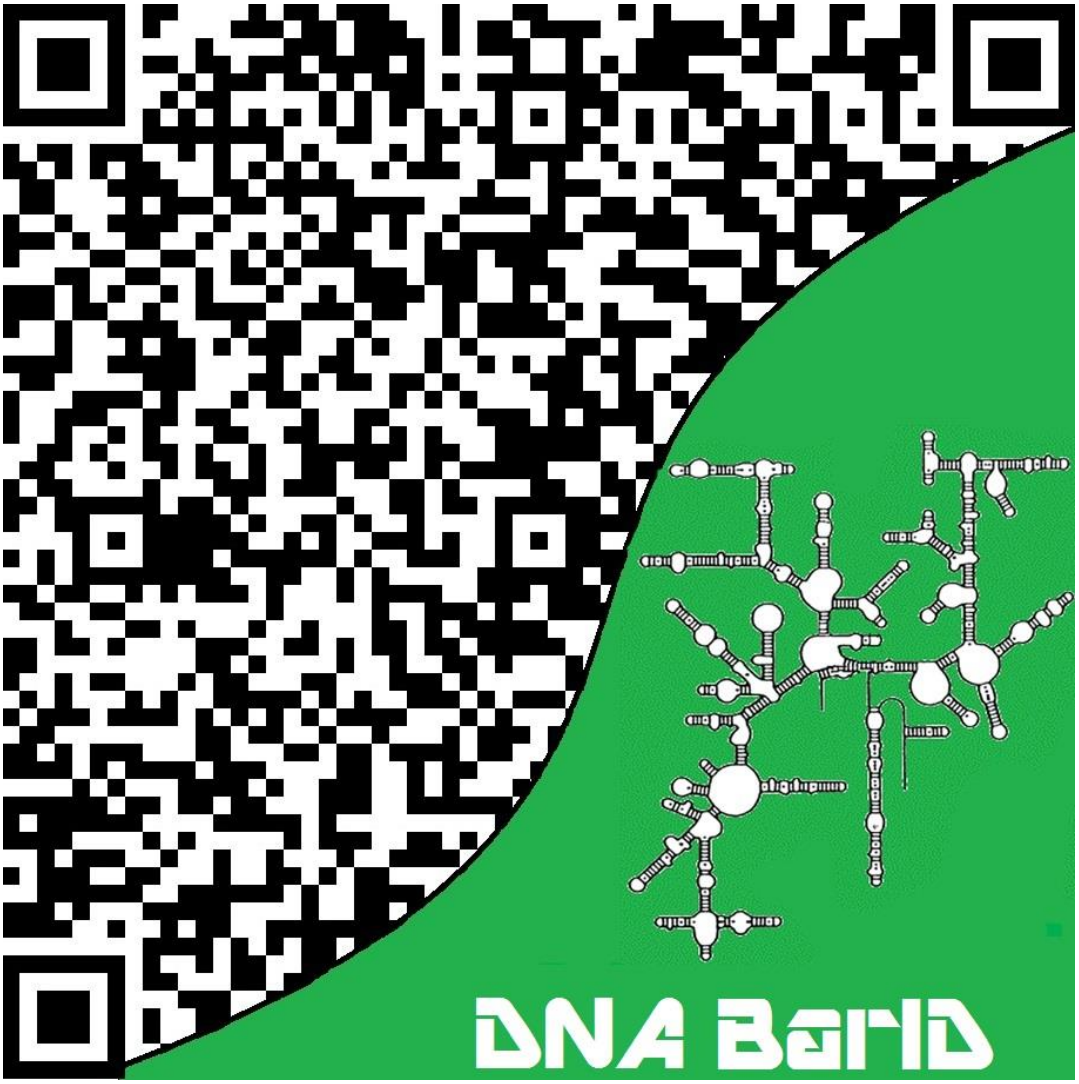
DNA BarID



http://www.neeri.res.in/DNA_BarID.htm

Contents:

1. About DNA BarID (DNA Barcode IDentification)

Next generation sequencing technologies is generating huge amounts of 16S rRNA sequence data from a wide range of microorganisms. As a result, gene sequence databases are increasing rapidly. In order to identify taxonomic information of these data, there is a need for easy-to-use computer program, containing fast computational regular expression based method.

The objective of the DNA BarID software is to provide user friendly graphical user interface for identification of 16S rRNA sequences using QR-based DNA barcodes. The present library contains DNA barcodes for taxa Bacilli, Bacillales, Bacillaceae, and *Bacillus* from Phylum-Firmicutes, to search against query sequences.

DNA BarID implemented many options for the taxonomic identification using single QR DNA Barcode, using all pre-defined QR DNA barcodes, and regular expression against query sequences. It accepts FASTA format 16S rRNA sequences (.fasta/.txt/.fa/.seq/.fna) and search against QR-based DNA barcodes; and the estimated taxonomic assignment. The output explorers allow users to export results in respective text files. It included the QR code creation option, and helpful to create QR-codes for users own interest.

1.1 Contact

Ravi P More and Hemant J Purohit
Department: Environmental Genomics Division
Institute: CSIR- National Environmental Engineering Research Institute (NEERI)
Address: Nehru Marg, Nagpur – 440 015, Maharashtra, India
Tel: +917122249883
Fax: +917122243927
Email: hj_purohit@neeri.res.in, ravimore7@yahoo.in
Website: www.neeri.res.in

2. Installation

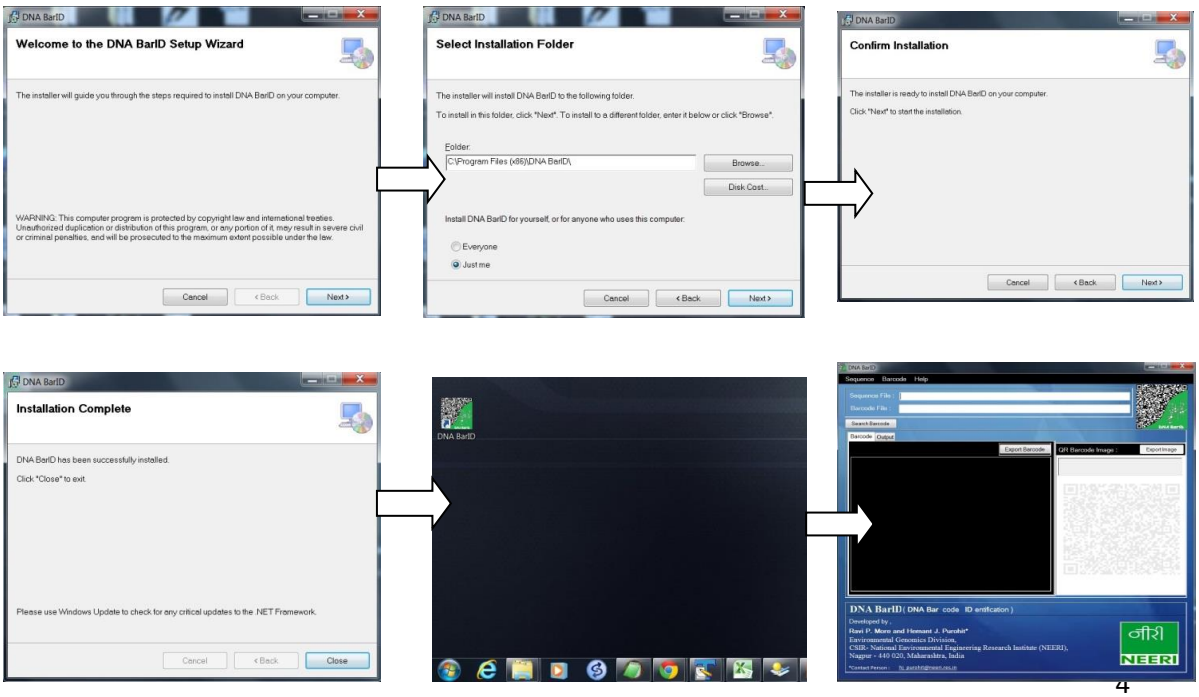
2.1 System Requirements:

- DNA BarID was developed for use on Microsoft Windows® operating systems: Windows 7 and Window 8 (32-bit and 64-bit). Currently it is not available for Mac, Linux and other platform.
- We recommend Windows 7 (32-bit and 64-bit) operating system.
- The computer on which BarID is installed should meet the following hardware requirements:
- The minimum computer requirements are at least 4 GB of RAM and 20 GB of available hard disk space with Intel Pentium® processor.
- Microsoft .NET Framework 4 is required.
- The more RAM and faster your CPU (processor) is, the faster an analysis will finish.

2.2 Steps to installation DNA BarID on Windows:

i. Download DNA BarID Windows installation package.
http://www.neeri.res.in/DNA_BarID_x86_(32-bit).zip
http://www.neeri.res.in/DNA_BarID_x64_(64-bit).zip

ii. Extract and Launch the downloaded setup.exe file and follow the Setup wizard by clicking next button as shown in following figures.



iii. After successful completion of setup, DNA BarID icon appeared in Start Menu. You can find at location: (C:\Program files\DNA BarID).
As well as shortcut icon present on Desktop.

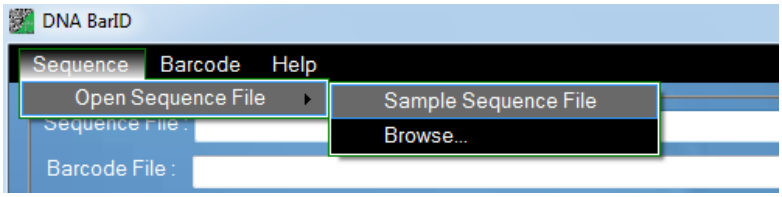
iv. User can click either of the option to open DNA BarID software.

v. If any error massage occurred during the uploading files, please provide administrator permission to access C:\ using following steps (Start-Control Panel-User account and family safety-User account-Change user account control settings-Never notify- OK- Restart Computer).

2.3 Tutorial for use of DNA BarID (Simple steps to perform analysis)

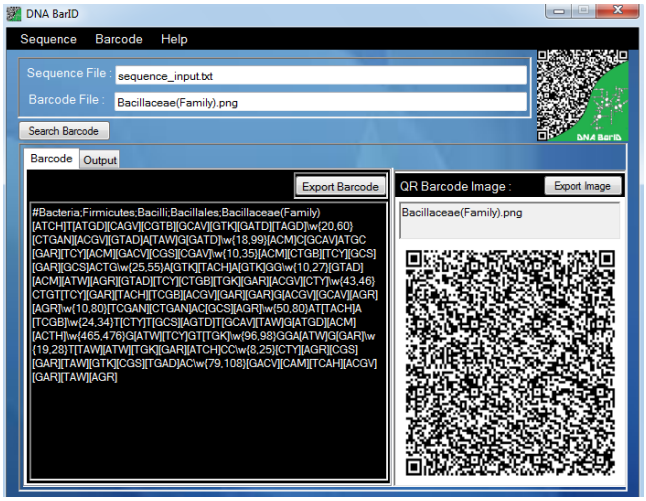
Step 1:

Click on Sequence menu - Open Sequence file – Sample Sequence File



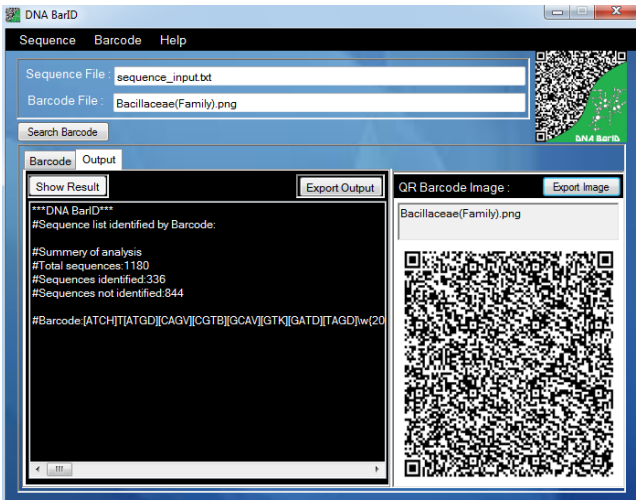
Step 2:

Click on Barcode Menu - Open QR DNA barcode – Sample QR DNA Barcode – Bacillaceae (Family).png or Select All QR DNA Barcodes.



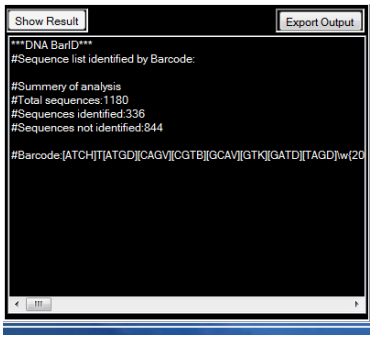
***Step 3*:**

Click on Search Barcodes and then Show Result



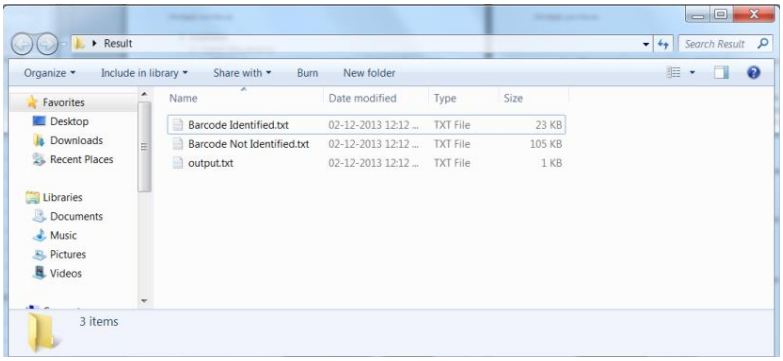
Step 4:

Click on Export Output and then Save files in target desired folder (ex. Desktop/Result)



Step 5:

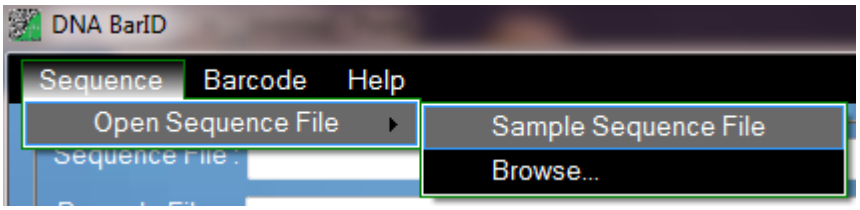
Open target folder (ex. Desktop/Result) and observed results files.



3. Taxonomic Identification

3.1 Open Sequence file

- *Click on Sequence menu* | *Open Sequence file*
- This option allows user to input multiple FASTA format 16S rRNA sequences in .fasta/.txt/.fa/.seq/.fna extension file format.
- Click on Sequence Menu and choose “Browse” option from Open Sequence file to upload from your PC location.
- You can load sample dataset file from Sequence menu (See fig.1).



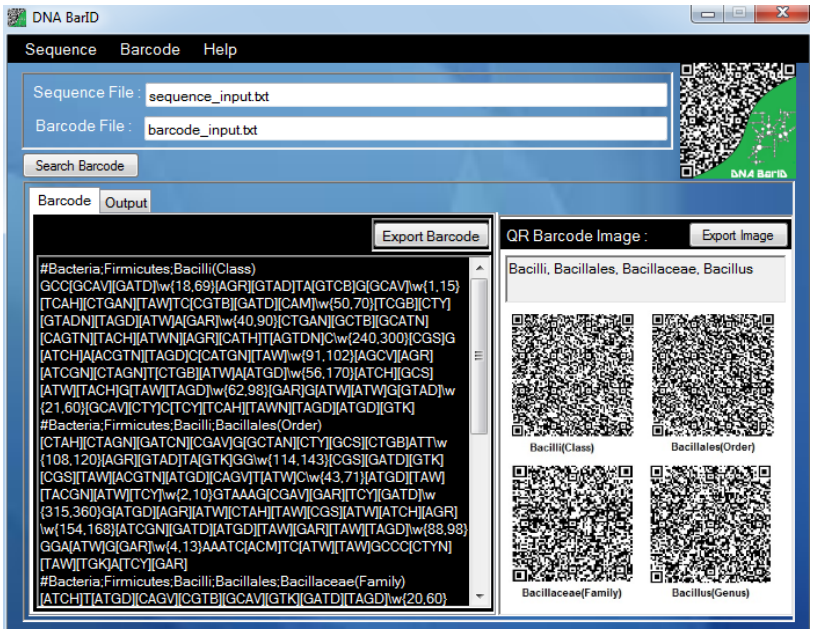
3.2 Barcode Menu

3.2.1 Open QR DNA barcode

- *Click on Barcode Menu* | *Open QR DNA barcode*
- The submenu option shows the option “Sample QR DNA Barcode” and “browse”.
- Sample QR DNA Barcode provide available library, select the any one QR DNA barcode from the list. .
- Browse option allowed opening of QR DNA Barcode image (.gif/.png/.jpg/.bmp).

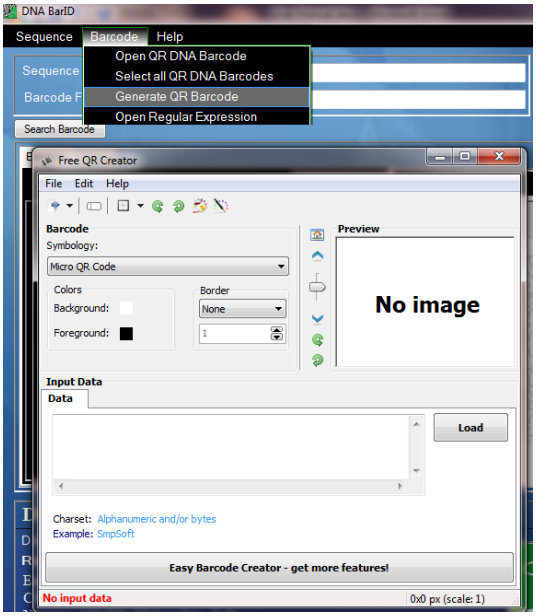
3.2.2 Select all QR DNA barcodes

- *Click on Barcode Menu* | *Select all QR DNA barcodes*
- User can select pre-defined all QR DNA barcodes available in library. At present, user can select by default taxa Bacilli, Bacillales, Bacillaceae, and *Bacillus* QR DNA barcodes.



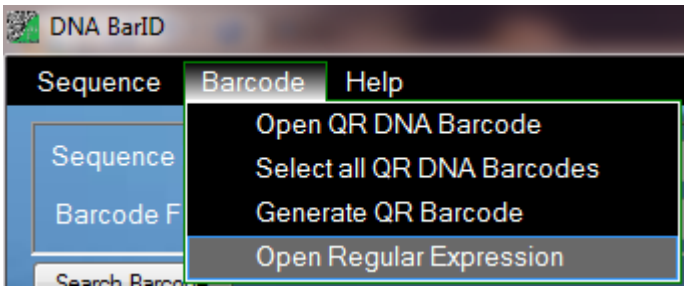
3.2.3 Generate QR barcode using Free QR Creator

- *Click on Barcode Menu | Generate QR barcode*
- The Free QR Creator plugin provides facility to create the QR code of a user specified nucleotide sequence name, regular expression or motif.
- *Usage example:* Input nucleotide sequence object in the text box. The Show circular view button is available on the
- So you can adjust it to an appropriate size.
- It is possible to rotate the circular view using the mouse wheel.
- Here user can save imagesin following formats: gif, png or jpg.



3.2.4 Open Regular Expression

- *Click on Barcode Menu | Open Regular Expression*
- Using the *Open Regular Expression* you can search any regular expression or DNA Motif against query sequence dataset.
- User must input text file, which includes regular expression or DNA Motif.
- Program will identify sequences, which contains particular regular expression or DNA Motif.

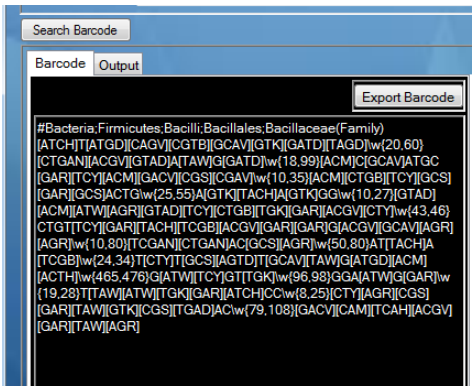


4. Result Export

DNA BarID offers a rich collection of exporting functions to allow users to export: Barcode, Output, and Image

4.1 Export Barcode

- To export Barcode, click the Export Barcode button in Barcode tab. This will bring up the “Export Barcode” dialog to export result, user can save resulting barcode text file at any computer location.



4.2 Exporting Result as text files

- *Output Panel | Click on Result Output*
- To export results, click the Export Result button above the output panel.
- The Export Image export dialog box will appear, user can save resulting text files at any computer location.

4.3 QR-Barcode Image Export

- *Image Panel | Click on QR-Barcode Image Export*
- To export a QR barcode image, click the Export Image button above the Image panel.
- The Export Image export dialog box will appear, user can save file at any location.

5. Help

5.1 Content

- In this section, user can read the contents of DNA BarID with respect to Installation and Taxonomic Identification information.
- Please write email to hj_purohit@neeri.res.in, ravimore7@yahoo.in, if any queries.