nBMST: the non-B DNA Motif Search Tool
Tutorial (*Version 1.0 - March 2011*)

Below are step-by-step instructions on how to submit your own DNA sequences to find potential non-B DNA motifs using the non-B DNA Motif Search Tool (nBMST).

1) Access non-B DNA Motif Search Tool (nBMST) at http://nonb.abcc.ncifcrf.gov/apps/nBMST/ .

2) Select one (Figure 1) or more (Figure 2) non-B DNA motifs. You may also choose all the motifs, if desired. Use Ctrl or Shift key to select multiple motifs.

Figure 1: One non-B DNA motif, *G-quadruplex forming repeats* is selected.

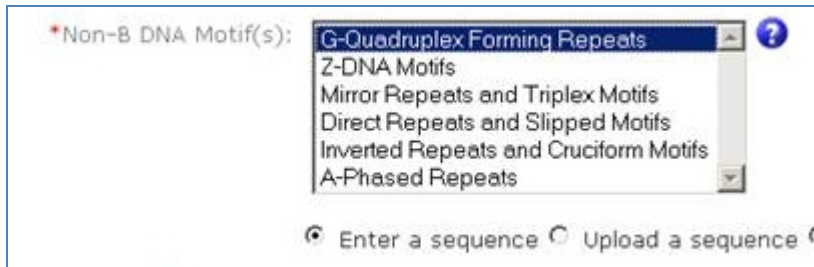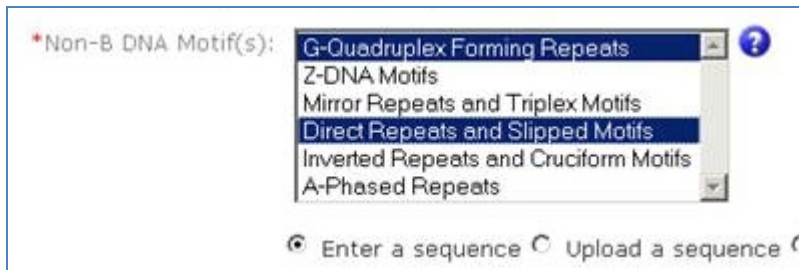

Figure 2: Two non-B DNA motifs, *G-quadruplex forming repeats* and *Direct Repeats and Slipped Motifs* are selected using Ctrl key.

Please note that Slipped Motifs are subsets of Direct Repeats.

3) There are two different ways of submitting your sequences in FASTA format:

(a) **Enter a sequence** allows you to copy and paste your favorite nucleotide.

Figure 3: A DNA sequence in FASTA format is pasted in the text box.
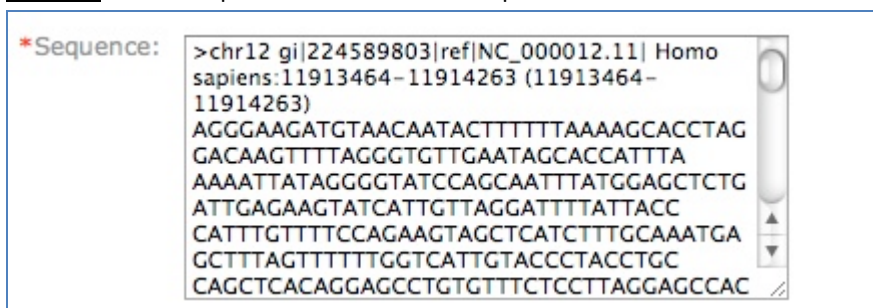
 (b) **Upload a sequence** allows you to upload your sequence for your local computer or external disk.

Figure 4: A DNA sequence is uploaded.

Please note that your sequence may contain multiple FASTA files. The maximum file size allowed is 20 megabytes. If you have files larger than this allowed data size, please contact us.
Two example sequences (single and multiple) are available for demonstration purposes.

5) Turnaround time for results will vary depending on the size of the sequence, the number of non-B DNA motifs selected and the type of non-B DNA motif selected. An email address is recommended if your input sequences are large and/or if you selected multiple motifs so that a notification email will be sent to you once the jobs are complete.

The following screenshot is a sample result page.

Figure 5: The result page displays several useful information including job id, total results, time remaining for downloading your files, link for future retrieval of your results, links for downloading all the files for this job (includes tab delimited files, GFF files, and composite image of all the motifs selected), and individual non-B DNA motif sections.

6) Click on the arrow pointing down to expand the result.

Figure 6: Individual result for each motif

Figure 7: The expanded result contains two panels. The top panel is a graphical image of the non-B DNA motifs across the submitted nucleotide sequence. The bottom panel contains details of these non-B DNA motifs including the start and stop coordinates, strand, length and actual sequence of the motif.
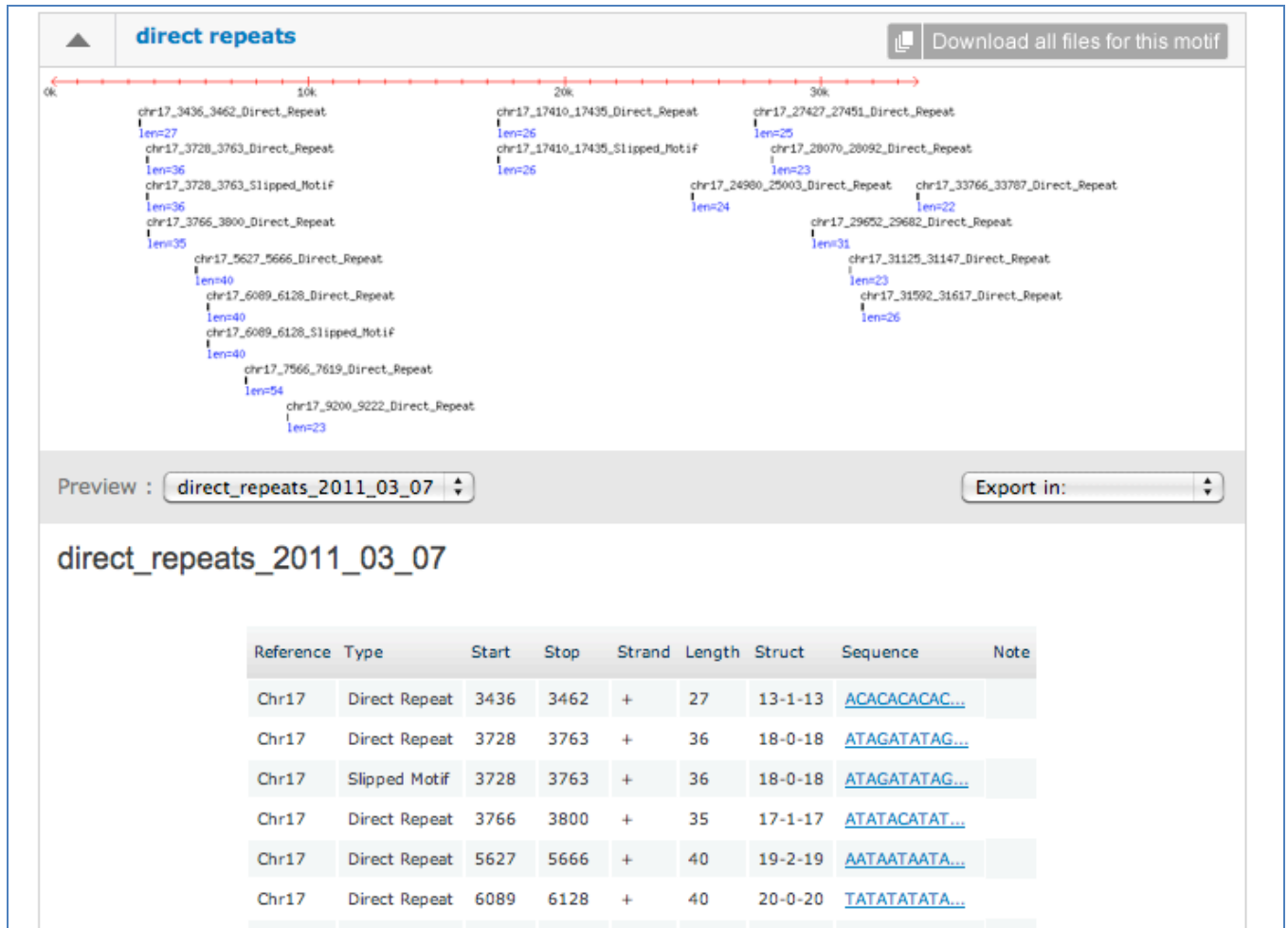
7) The results can be downloaded in two ways:

 i) To download individual files for just one type of non-B DNA motif, click on *Download all files for this motif*. This will download GFF and tab delimited files.

 ii) To download all the files for all the motifs you have selected, click on *Download all files for this job.*

<u>Figure 8:</u> Downloading the comprehensive zipped file for the entire job.
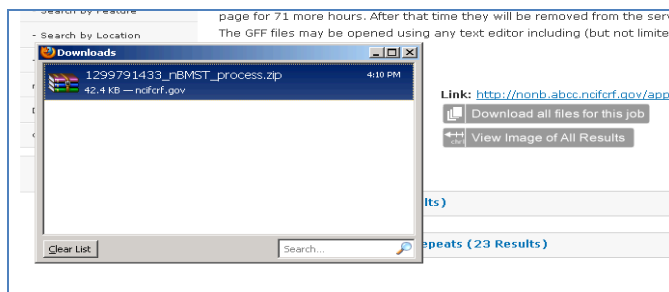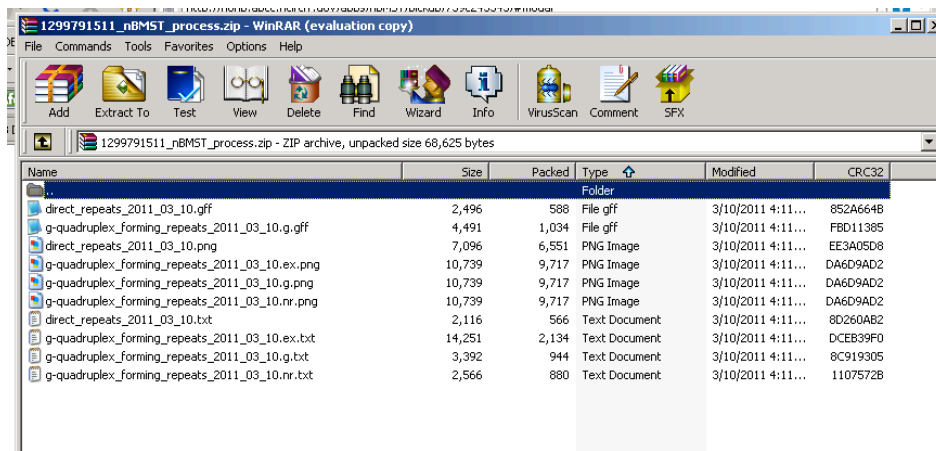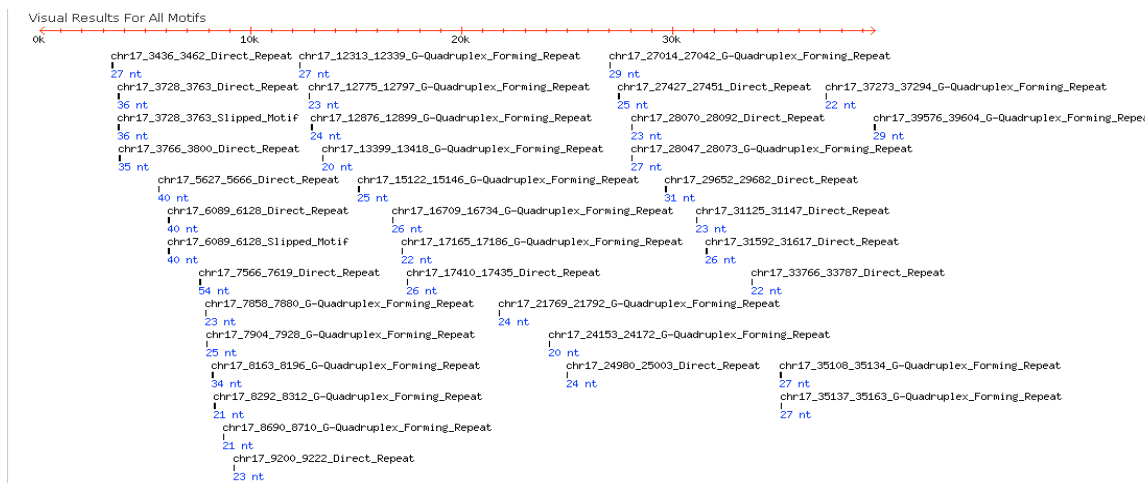

<u>Figure 9:</u> This comprehensive file includes all the GFF files, tab delimited files, and PNG images.

8) To view all the non-B DNA motifs for all motifs selected in your job, click on **View image of all results**.

For comments and suggestions, please contact us via the contact form (http://nonb.abcc.ncifcrf.gov/contact) or email us at nonb@nih.gov .