**Readme for BACIQ**

This guide provides instructions on how to use the BACIQ software to compute uncertainty in the relative abundance between two channels for multi-peptide proteins. This uncertainty is calculated as the user specified percentage of confidence interval. The code can be slightly modified to output the entire probabilistic distribution of the true fraction of protein in one channel, which can be post processed further as desired by the user.

**System Requirements (Recommended):**

1. Unix/Linux Operating System
2. Python - 2.7.3\*
   * Numpy - 1.13.3\* and above
   * Pandas - 0.15.2 dev\* and above
   * Pystan - 2.17.1.0\* and above

\* This code was tested using the above-mentioned versions of the programs.

1. **How to use this program?** 
   1. Copy the folder “BACIQ\_v1.0.zip” to the desired directory. Extract the “BACIQ\_v1.0.zip” and copy the extracted contents to the desired directory.
   2. Replace SampleInput.csv in the BACIQ\_v1.0 folder with your Input CSV file. Please make sure your input CSV file has the same column names as the SampleInput.csv file you are replacing. Also, input file should be in .csv format.
   3. Open Terminal on your Unix System
   4. Navigate to the BACIQ\_v1.0 directory path (using “cd /path” command)
   5. Use system command “ls” or “pwd” to ensure you are in the intended directory
   6. Enter the following commands in Terminal to run the program:

> sh run\_linux.sh

* 1. Keep entering the values as asked (Please ensure that the number of cores input is not more than the total proteins in your Input file)

1. **Locating and Interpreting the Output:**
   1. Once the program finishes running, you can find then output at the following path: /yourpath/BACIQ\_v1.0/Output/outFile\_hist.csv (Please ignore other csv files in the Output folder except outFile\_hist.csv)
   2. This outFile\_hist.csv contains:
      1. Lower end of the confidence interval
      2. Median value
      3. Higher end of the confidence interval
      4. Protein name as index

**For any help or questions, please e-mail us at** [**meerag@princeton.edu**](mailto:meerag@princeton.edu)