proteiNorm – A user-friendly tool for normalization and analysis of TMT and label-free protein/proteome quantification

Stefan Graw 1,2, Jillian Tang, Stephanie D Byrum\*

1 Department of Biochemistry and Molecular Biology, University of Arkansas for Medical Sciences, Little Rock, AR

2 Arkansas Children's Research Institute, Little Rock, AR

ABSTRACT (Word Style “BD\_Abstract”). All manuscripts must be accompanied by an abstract. The abstract should briefly state the problem or purpose of the research, indicate the theoretical or experimental plan used, summarize the principal findings, and point out major conclusions. Abstract length is one paragraph.

KEYWORDS: Proteomics, Normalization, Differential analysis

1. **Introduction**

General introduction; What is the problem/ impact of said problem; What has been done; What are the gaps; What did we do/ How did we fill gaps

1. **Methods**
   1. **Implementation**

proteiNorm implemented in R statistical language (<http://r-project.org>, version 3.6) using the package “shiny” to provide a user-friendly user interface. proteiNorm can be downloaded from GitHub (<https://github.com/ByrumLab/proteiNorm>).

* 1. **Data Requirements**

As input, proteiNorm expects tab-separated peptide and/or protein data produced by XXX (where is the data coming from), where the column names of the measured intensities start with “Reporter intensity corrected ”, followed by an integer and an optional label (e.g. “Reporter intensity corrected 5 TMT2”,). The raw data should not be in logarithmic scale

Raw data

TMT / label free

Column name: Reporter.intensity.corrected…

* 1. **Normalization Methods**
  2. **Differential Analysis**
  3. **Estimating Empirical Statistical Power**

1. **Results**
2. **Discussion**
3. **Conclusion**
4. **References**

TEXT (Word Style “TA\_Main\_Text”). For full instructions, please see the journal’s Instructions for Authors. Depending on the journal, the manuscript may include sections such as an introduction, experimental details (sections titled Experimental Methods, Experimental Section, or Materials and Methods), theoretical basis (sections titled Theoretical Basis or Theoretical Calculations), results, discussion, and conclusions.

FIGURES (Word Style “VA\_Figure\_Caption”). Each figure must have a caption that includes the figure number and a brief description, preferably one or two sentences. The caption should immediately follow the figure with the format “**Figure 1.** Figure caption.” All figures must be mentioned in the text consecutively and numbered with Arabic numerals. The caption should be understandable without reference to the text. It is preferable to place the keys to symbols used in the figure in the caption, not in the artwork. Ensure that the symbols and abbreviations in the caption agree with those in the figure itself and in the text and that the figure is already sized appropriately.

SCHEMES (Word Style “VC\_Scheme\_Title”). Chemical reactions and flow diagrams may be called schemes. Schemes may have brief titles describing their contents. The artwork for each scheme should immediately follow the scheme title. The title should follow the format “**Scheme 1.** Scheme Title”. All schemes must be mentioned in the text consecutively and numbered with Arabic numerals. Schemes may also have footnotes (use Word Style “FD\_Scheme\_Footnote”), inserted after the artwork.

CHARTS (Word Style “VB\_Chart\_Title”). Lists of structures may be called charts. Charts may have brief titles describing their contents. The title should follow the format “**Chart 1.** Chart Title”. Charts may also have footnotes (use Word Style “FC\_Chart\_Footnote”). To insert the chart into the template, be sure it is already sized appropriately and paste it immediately after the chart title.

TABLES. Each table must have a brief (one phrase or sentence) title that describes its contents. The title should follow the format “**Table 1.** Table Title” (Word Style “VD\_Table\_Title”). The title should be understandable without reference to the text. Put details in footnotes, not in the title (use Word Style “FE\_Table\_Footnote”). Define nonstandard abbreviations in footnotes.

Use tables (Word Style “TC\_Table\_Body”) when the data cannot be presented clearly as narrative, when many precise numbers must be presented, or when more meaningful interrelationships can be conveyed by the tabular format. Do not use Word Style “TC\_Table\_Body” for tables containing artwork. Tables should supplement, not duplicate, text and figures. Tables should be simple and concise. It is preferable to use the Table Tool in your word-processing package, placing one entry per cell, to generate tables.

**Displayed equations** can be inserted where desired making sure they are assigned Word Style "Normal". Displayed equations can only be one column wide. If the artwork needs to be two columns wide, it must be relabeled as a figure, chart, or scheme and mentioned as such in the text.

ASSOCIATED CONTENT

(Word Style “TE\_Supporting\_Information”). **Supporting Information**. A listing of the contents of each file supplied as Supporting Information should be included. For instructions on what should be included in the Supporting Information as well as how to prepare this material for publications, refer to the journal’s Instructions for Authors.  
The following files are available free of charge.  
brief description (file type, i.e., PDF)  
brief description (file type, i.e., PDF)

AUTHOR INFORMATION

Corresponding Author

\*(Word Style “FA\_Corresponding\_Author\_Footnote”). \* (Word Style “FA\_Corresponding\_Author\_Footnote”). Give contact information for the author(s) to whom correspondence should be addressed.

Present Addresses

†If an author’s address is different than the one given in the affiliation line, this information may be included here.

Author Contributions

The manuscript was written through contributions of all authors. All authors have given approval to the final version of the manuscript. ‡These authors contributed equally. (match statement to author names with a symbol)

Funding Sources

Any funds used to support the research of the manuscript should be placed here (per journal style).

Notes

Any additional relevant notes should be placed here.

ACKNOWLEDGMENT

(Word Style “TD\_Acknowledgments”). Generally the last paragraph of the paper is the place to acknowledge people, organizations, and financing (you may state grant numbers and sponsors here). Follow the journal’s guidelines on what to include in the Acknowledgments section.

ABBREVIATIONS

CCR2, CC chemokine receptor 2; CCL2, CC chemokine ligand 2; CCR5, CC chemokine receptor 5; TLC, thin layer chromatography.

REFERENCES

(Word Style “TF\_References\_Section”). References are placed at the end of the manuscript. Authors are responsible for the accuracy and completeness of all references. Examples of the recommended format for the various reference types can be found at <http://pubs.acs.org/page/4authors/index.html>. Detailed information on reference style can be found in *The ACS Style Guide,* available from Oxford Press.

BRIEFS (Word Style “BH\_Briefs”). If you are submitting your paper to a journal that requires a brief, provide a one-sentence synopsis for inclusion in the Table of Contents.

SYNOPSIS (Word Style “SN\_Synopsis\_TOC”). If you are submitting your paper to a journal that requires a synopsis, see the journal’s Instructions for Authors for details.