

# Moderate-to-Severe diarrhea 16S dataset

December 3, 2014

This data package contains the information used to run the analyses found in "Diarrhea in young children from low-income countries leads to large-scale alterations in intestinal microbiota composition". Measurements are the number of reads annotated for a particular cluster within a given sample followed by filtering. Sequencing was performed on the 454 Flex platform. Data is stored as an `MRExperiment`-class object. The count matrix was generated using DNAClust (<http://dnaclust.sourceforge.net/>). For more details please refer to the paper.

The help file `?msd16s` describes the example dataset.

## 1 The Data

We start by loading the library and the data.

```
> suppressMessages(library(metagenomeSeq))
> library(msd16s)
> data(msd16s)
```

This will load the `msd16s` object of class `MRExperiment`. As described in the `metagenomeSeq` vignette, `print` (or `show`) will display summary information.

```
> msd16s

MRExperiment (storageMode: environment)
assayData: 26044 features, 992 samples
  element names: counts
protocolData: none
phenoData
  sampleNames: 100259 100262 ... 602385 (992 total)
  varLabels: Type Country ... Dysentery (5 total)
  varMetadata: labelDescription
featureData
  featureNames: 54 94 ... 276421 (26044 total)
```

```

fvarLabels: OTU Taxonomy ... clusterCenter (10 total)
fvarMetadata: labelDescription
experimentData: use 'experimentData(object)'
Annotation:

```

The data in `msd16s` is the substrate for the analysis described in "Diarrhea in young children from low-income countries leads to large-scale alterations in intestinal microbiota composition". Included in the `MRExperiment` object are the counts, phenotype and feature information.

The phenotype information can be accessed with the `phenoData` and `pData` methods:

```
> phenoData(msd16s)
```

```

An object of class 'AnnotatedDataFrame'
sampleNames: 100259 100262 ... 602385 (992 total)
varLabels: Type Country ... Dysentery (5 total)
varMetadata: labelDescription

```

```
> head(pData(msd16s))
```

	Type	Country	Age	AgeFactor	Dysentery
100259	Case	Gambia	14	[12,18)	1
100262	Control	Gambia	24	[24,60)	0
100267	Case	Gambia	17	[12,18)	0
100274	Case	Gambia	36	[24,60)	0
100275	Case	Gambia	29	[24,60)	0
100277	Case	Gambia	29	[24,60)	0

The feature information including cluster representative sequence can be accessed with the `featureData` and `fData` methods:

```
> featureData(msd16s)
```

```

An object of class 'AnnotatedDataFrame'
featureNames: 54 94 ... 276421 (26044 total)
varLabels: OTU Taxonomy ... clusterCenter (10 total)
varMetadata: labelDescription

```

```
> head(fData(msd16s))
```

	OTU
54	54
94	94
113	113

117 117  
 145 145  
 202 202

54 ;cellular organisms;Bacteria;Firmicutes;Bacilli;Lactobacillaceae  
 94 ;cellular organisms;Bacteria;Firmicutes;Bacilli;Lactobacillaceae  
 113 ;cellular organisms;Bacteria;Firmicutes;Bacilli;Lactobacillaceae  
 117 ;cellular organisms;Bacteria;Firmicutes;Bacilli;Lactobacillaceae

145 ;cellular organisms;Bacteria;Bacteroidetes/Chlorobi group;Bacteroidetes;Bacteroidia  
 202 ;cellular organisms;Bacteria;Bacteroidetes/Chlorobi group;Bacteroidetes;Bacteroidia

	superkingdom	phylum	class	order	family
54	Bacteria	Firmicutes	Bacilli	Lactobacillales	Lactobacillaceae
94	Bacteria	Firmicutes	Bacilli	Lactobacillales	Lactobacillaceae
113	Bacteria	Firmicutes	Bacilli	Lactobacillales	Lactobacillaceae
117	Bacteria	Firmicutes	Bacilli	Lactobacillales	Lactobacillaceae
145	Bacteria	Bacteroidetes	Bacteroidia	Bacteroidales	Prevotellaceae
202	Bacteria	Bacteroidetes	Bacteroidia	Bacteroidales	Bacteroidaceae

	genus	species
54	Lactobacillus	Lactobacillus sp. TSK G32-2
94	Lactobacillus	Lactobacillus sp. TSK G32-2
113	Lactobacillus	Lactobacillus sp. TSK G32-2
117	Lactobacillus	Lactobacillus sp. TSK G32-2
145	Prevotella	Prevotella sp. DJF_RP53
202	Bacteroides	Bacteroides fragilis

54 CATGCTGCCTCCCGTAGGAGTTTGGGCCGTGTCTCAGTCCCAATGTGGCCGATCAACCTCTCAGTTCGGCTACGTATCATCAAC  
 94 CATGCTGCCTCCCGTAGGAGTTTGGGCCGTGTCTCAGTCCCAATGTGGCCGATCAACCTCTCA  
 113 CATGCTGCCTCCCGTAGGAGTTTGGGCCGTGTCTCAGTCCCAATGTGGCCGATCAAC  
 117 CATGCTGCCTCCCGTAGGAGTTTGGGCCGTGTCTCAGTCCCAATGTGGCCGATCAAC  
 145 CATGCTGCCTCCCGTAGGAGTTTGGACCGTGTCTCAGTTCCTCAATGTGGGGG  
 202 CATGCTGCCTCCCGTAGGAGTTTGGACCGTGTCTCAGTTCCTCAATGTGGGGG

The raw or normalized counts matrix can be accessed with the MRcounts function:

```
> head(MRcounts(msd16s[,1:10]))
```

	100259	100262	100267	100274	100275	100277	100291	100292	100293	100294
54	0	0	0	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0	0	0	0
113	0	0	0	0	0	0	0	0	0	0
117	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0
202	0	0	0	0	0	0	0	0	0	0

Using this class, the object can be easily subsetted, for example:

```
> msd16s_bangladesh = msd16s[,pData(msd16s)$Country == "Bangladesh"]  
> msd16s_bangladesh
```

```
MRExperiment (storageMode: environment)  
assayData: 26044 features, 206 samples  
  element names: counts  
protocolData: none  
phenoData  
  sampleNames: 600002 600005 ... 602385 (206 total)  
  varLabels: Type Country ... Dysentery (5 total)  
  varMetadata: labelDescription  
featureData  
  featureNames: 54 94 ... 276421 (26044 total)  
  fvarLabels: OTU Taxonomy ... clusterCenter (10 total)  
  fvarMetadata: labelDescription  
experimentData: use 'experimentData(object)'  
Annotation:
```