

Example data for use with the beadarray package

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1 Data Introduction

This package provides a lightweight dataset for those wishing to try out the examples within the *beadarray* package. The data in this package are a subset of the MAQC bead-level data available in the *beadarrayUseCases* package. ‘Bead-level’ refers to the availability of intensity and location information for each bead on each *BeadArray* in an experiment. In this dataset, *BeadArrays* were hybridized with either Universal Human Reference RNA (UHRR, Stratagene) or Brain Reference RNA (Ambion) as used in the MAQC project. This package includes a representation of the bead-level data for 2 arrays in the data object `exampleBLdata`, which was created by *beadarray*. The summarised data for all 12 arrays are given in the `exampleSummaryData` object, which was created by first reading the bead-level data for all 12 sections into *beadarray* and then summarising using the procedures described in the vignette for *BeadArrayUseCases*.

2 Loading the data

The example datasets can be loaded using the `data` function. The first dataset comprises two sections from the bead-level MAQC dataset generated at Cancer Research Uk (Cambridge Research Institute) that have been read in using the `beadarray` package. The second dataset is the summarised data of all sections from the same dataset.

```
> library(beadarrayExampleData)
> data(exampleBLData)
> exampleBLData
```

```
-----
Experiment information (@experimentData)
-----
$sdfFile
[1] "/home/dunnin01/software/R-devel/library/BeadArrayUseCases/extdata/BeadLevelBabFiles"

$platformClass
[1] "Slide"

$annotation
[1] "Humanv3"
```

```
-----
Per-section data (@sectionData)
-----
Targets

                                                                 directory
1 /home/dunnin01/software/R-devel/library/BeadArrayUseCases/extdata/BeadLevelBabFiles
2 /home/dunnin01/software/R-devel/library/BeadArrayUseCases/extdata/BeadLevelBabFiles
  sectionName      textFile greenImage      greenLocs greenxml
1 4613710017_B 4613710017_B.bab      <NA> 4613710017_B.bab      <NA>
2 4616494005_A 4616494005_A.bab      <NA> 4616494005_A.bab      <NA>
Metrics
```

```
          Date      Matrix Section RegGrn FocusGrn SatGrn
1 3/13/2009 6:45:04 PM 4613710017      B  0.13    0.70    0
12      04/01/09 04:50 4616494005      A  0.13    0.59    0
    P95Grn P05Grn RegRed FocusRed SatRed P95Red P05Red
```

```
1    704    36    0    0    0    0    0
12   678    38    0    0    0    0    0
```

SampleGroup

```
[1] "4613710017_B" "4616494005_A"
```

numBeads

```
[1] 1088369 1100773
```

Per-bead data (@beadData)

Raw data from section 4613710017_B

| | ProbeID | GrnX | GrnY | Grn | wt |
|------|---------|-----------|-----------|-----|----|
| [1,] | 10008 | 900.6661 | 10781.320 | 355 | 1 |
| [2,] | 10008 | 1992.5400 | 11352.000 | 377 | 1 |
| [3,] | 10008 | 1257.4790 | 7559.513 | 452 | 1 |
| [4,] | 10008 | 1700.1600 | 6351.157 | 267 | 1 |
| [5,] | 10008 | 1814.5210 | 3299.495 | 431 | 1 |

... 1088364 more rows of data

... data for 1 more section/s

```
> data(exampleSummaryData)
```

```
> exampleSummaryData
```

ExpressionSetIllumina (storageMode: list)

assayData: 49576 features, 12 samples

element names: exprs, se.exprs, nObservations

protocolData: none

phenoData

rowNames: 4613710017_B 4613710052_B ... 4616494005_A (12 total)

varLabels: sampleID SampleFac

varMetadata: labelDescription

featureData

featureNames: ILMN_1802380 ILMN_1893287 ... ILMN_1846115 (49576 total)

```

  fvarLabels: ArrayAddressID IlluminaID Status
  fvarMetadata: labelDescription
experimentData: use 'experimentData(object)'
Annotation: Humanv3
QC Information
  Available Slots:
    QC Items: Date, Matrix, ..., SampleGroup, numBeads
    sampleNames: 4613710017_B, 4613710052_B, ..., 4616443136_A, 4616494005_A

```

```
> pData(exampleSummaryData)
```

| | sampleID | SampleFac |
|--------------|--------------|-----------|
| 4613710017_B | 4613710017_B | UHRR |
| 4613710052_B | 4613710052_B | UHRR |
| 4613710054_B | 4613710054_B | UHRR |
| 4616443079_B | 4616443079_B | UHRR |
| 4616443093_B | 4616443093_B | UHRR |
| 4616443115_B | 4616443115_B | UHRR |
| 4616443081_B | 4616443081_B | Brain |
| 4616443081_H | 4616443081_H | Brain |
| 4616443092_B | 4616443092_B | Brain |
| 4616443107_A | 4616443107_A | Brain |
| 4616443136_A | 4616443136_A | Brain |
| 4616494005_A | 4616494005_A | Brain |

3 Data creation

The following commands were used to create the data included with this package.

```

> require(BeadArrayUseCases)
> targets <- read.table(system.file("extdata/BeadLevelBabFiles/targetsHT12.txt", pack
> sn <- paste(targets[,3], targets[,4], sep="_")
> babFilePath <- system.file("extdata/BeadLevelBabFiles", package = "BeadArrayUseCase
> exampleBLData <- readIllumina(dir=babFilePath, sectionNames=sn[c(1,12)], useImages=
> bsh <- BASH(exampleBLData, array=c(1,2))
> exampleBLData <- setWeights(exampleBLData, wts = bsh$wts, array=1:2)
> data <- readIllumina(dir=babFilePath, sectionNames=sn, useImages=FALSE, illuminaAnn
> grnchannel <- new("illuminaChannel", transFun = logGreenChannelTransform, outlierFu
> grnchannel.unlogged <- new("illuminaChannel", transFun = greenChannelTransform, out

```

```
> exampleSummaryData <- summarize(data, list(grnchannel, grnchannel.unlogged), useSam  
> pData(exampleSummaryData)[,2] <- targets[,2]  
>  
>
```