# qEV Notebook

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```
library(tidyverse)
library(cowplot)
library(broom)
library(here)
```

### Custom summary function

```
quick_summary <- function(df, ..., param_var) {
  param_var <- enquo(param_var)
  df %>%
    group_by_(.dots = lazyeval::lazy_dots(...)) %>%
    summarise(N = length(!!param_var),
              mean = mean(!!param_var, na.rm = TRUE),
              sd = sd(!!param_var, na.rm = TRUE),
              se = sd/sqrt(N))
}
```

```
data1 <- read_csv("Brdu_MCF7_Short Term.csv") %>%
  gather(Sample,Percent,2:5)
```

```
## Parsed with column specification:
## cols(
##   Mouse = col_character(),
##   Vehicle = col_double(),
##   ICI = col_double(),
##   CEP = col_double(),
##   CEPandICI = col_double()
## )
```

```
data2 <- data1 %>%
    group_by(Sample) %>%
    summarise( N = length(Percent),
               mean = mean(Percent,na.rm=TRUE),
               sd = sd(Percent, na.rm = TRUE),
               se = sd/sqrt(N))
data2
```

```
## # A tibble: 4 x 5
##   Sample        N  mean    sd    se
##   <chr>     <int> <dbl> <dbl> <dbl>
## 1 CEP           5  20.3  1.13 0.505
## 2 CEPandICI     5  18.2  1.85 0.829
## 3 ICI           5  16.3  2.08 0.930
## 4 Vehicle       5  23.1  2.45 1.10
```

```
data1 %>%
  quick_summary(Sample, param_var = Percent)
```

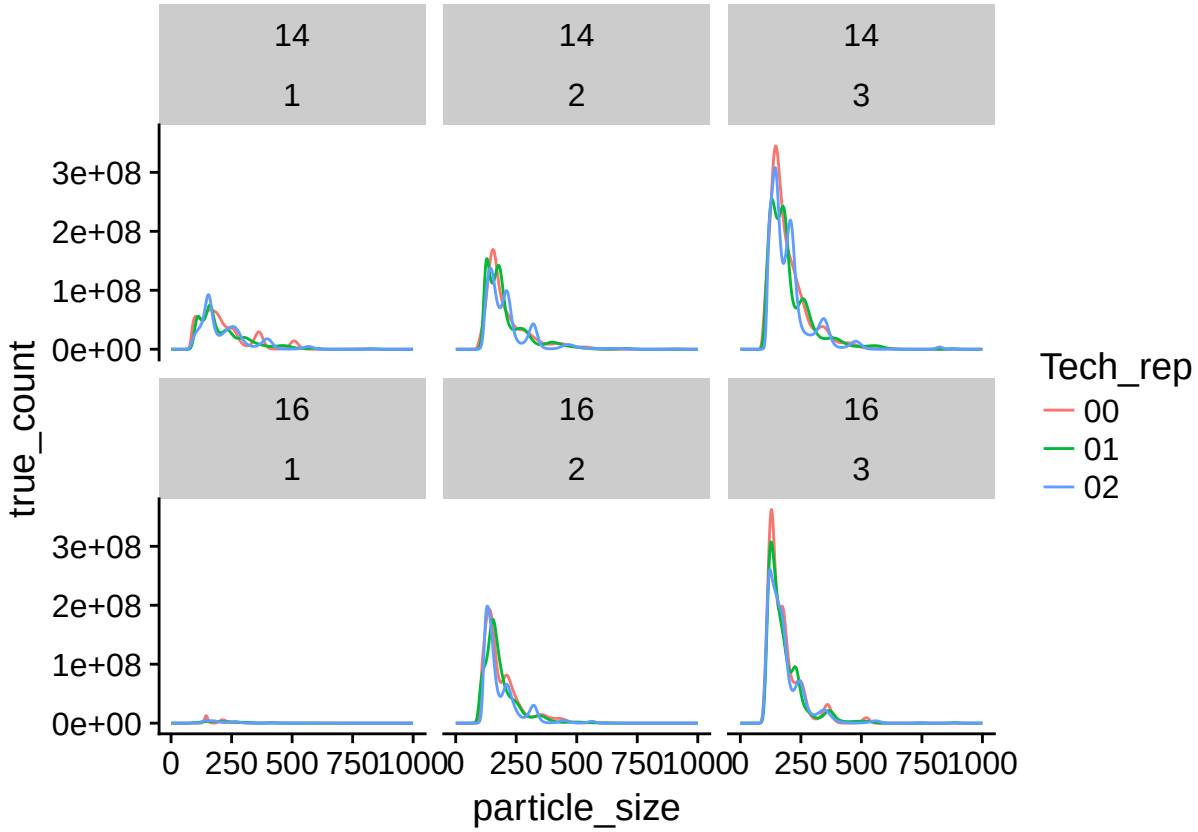
```
## # A tibble: 4 x 5
```

```
##   Sample        N  mean    sd    se
##   <chr>     <int> <dbl> <dbl> <dbl>
## 1 CEP           5  20.3  1.13 0.505
## 2 CEPandICI     5  18.2  1.85 0.829
## 3 ICI           5  16.3  2.08 0.930
## 4 Vehicle       5  23.1  2.45 1.10
```

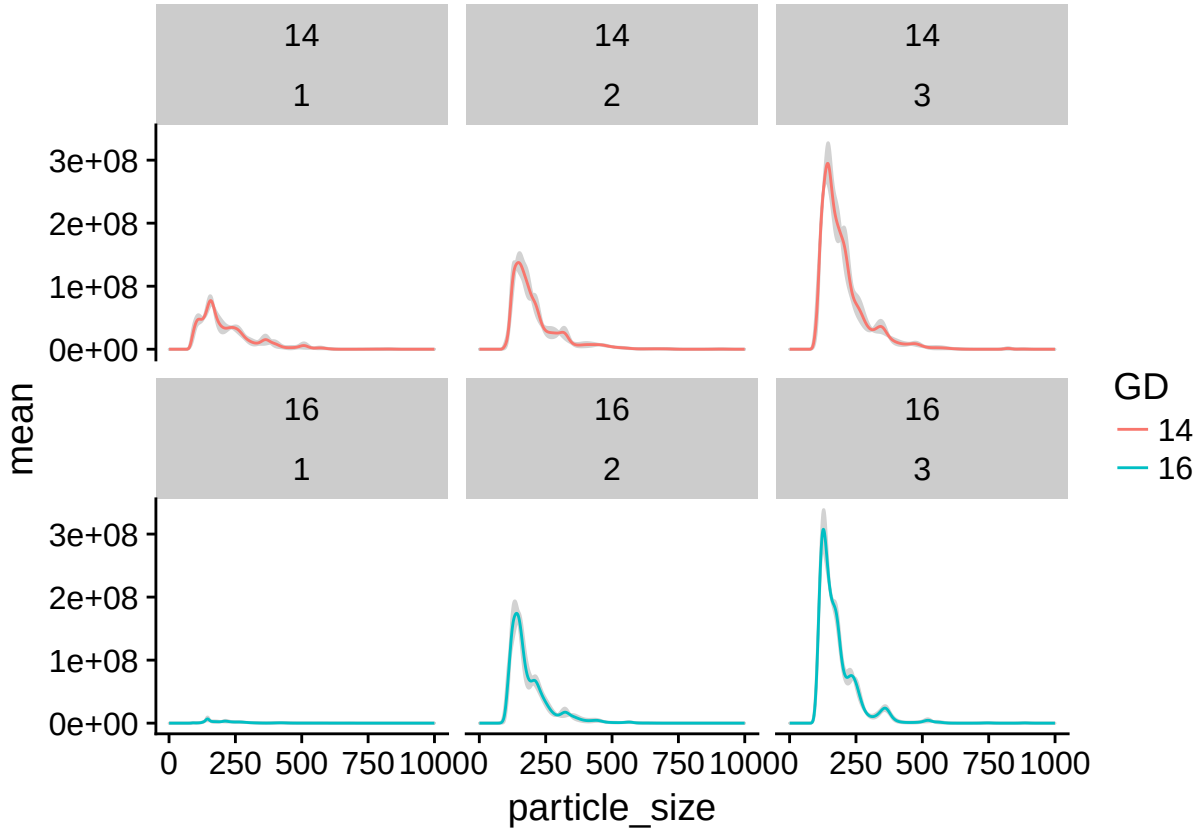
```
raw_data <- read_csv("nanosight_data.csv")

data <- raw_data %>%
  gather(samples,count,2:19) %>%
  separate(samples, into = c("GD", "Aliquot","Dilution", "Injection", "Tech_rep")) %>%
  mutate_at(vars(GD,Aliquot,Injection,Tech_rep),as.factor) %>%
  mutate_at(vars(Dilution),as.numeric) %>%
  mutate(true_count = Dilution * count)

data
```

```
## # A tibble: 18,000 x 8
##    particle_size GD     Aliquot Dilution Injection Tech_rep count true_co~
##            <dbl> <fctr> <fctr>     <dbl> <fctr>    <fctr>   <int>    <dbl>
##  1         0.500 16     3           20.0 1         00           0        0
##  2         1.50  16     3           20.0 1         00           0        0
##  3         2.50  16     3           20.0 1         00           0        0
##  4         3.50  16     3           20.0 1         00           0        0
##  5         4.50  16     3           20.0 1         00           0        0
##  6         5.50  16     3           20.0 1         00           0        0
##  7         6.50  16     3           20.0 1         00           0        0
##  8         7.50  16     3           20.0 1         00           0        0
##  9         8.50  16     3           20.0 1         00           0        0
## 10         9.50  16     3           20.0 1         00           0        0
## # ... with 17,990 more rows
```

```
data %>%
  ggplot(aes(x = particle_size, y = true_count, color = Tech_rep)) +
  geom_line()+
  facet_wrap(GD~Aliquot)
```




```
data %>%
  quick_summary(particle_size,GD,Aliquot, param_var = true_count ) %>%
  ggplot(aes(x = particle_size, y = mean, color = GD))+
  geom_ribbon(aes(ymin=mean-se, ymax=mean+se),
              alpha=0.2,fill = alpha('grey12', 0.2),
              color = alpha('grey12',0.2)) + #error bars
  geom_line()+
  facet_wrap(GD~Aliquot)
```




```
data %>%
  quick_summary(GD,Aliquot,Tech_rep, param_var = true_count) %>%
  rename(rep_mean = mean) %>%
  quick_summary(GD,Aliquot,param_var = rep_mean)
```

```
## # A tibble: 6 x 6
## # Groups: GD [?]
##   GD     Aliquot     N     mean       sd      se
##   <fctr> <fctr>  <int>    <dbl>    <dbl>   <dbl>
## 1 14     1           3 10796015 1117927  645436
## 2 14     2           3 16541497 1357783  783916
## 3 14     3           3 34184210 2999985 1732042
## 4 16     1           3   532592   41605   24021
## 5 16     2           3 16900807 2071654 1196070
## 6 16     3           3 27582488 2061149 1190005
```