Data Setup

```
# Setup Sean's data
errors_sean <- read.csv("errors_table.csv", header = TRUE)
errors_sean$R <- errors_sean$I1 / errors_sean$I2

# Get the standard deviation for each animal in Sean's data
sean_sd <- aggregate(errors_sean$R, by = list(errors_sean$Animal), FUN = sd)
colnames(sean_sd) <- c("Animal", "stddev")

# Get the preformatted tidy data
tidydf <- read.csv("Tidy_Errors.csv", header = TRUE)

# Format sean's data to match the tidy data
sean_sd$Animal <- NULL
colnames(sean_sd) <- c("std_dev")
sean_sd$mean_R <- rep(1000, 57)
sean_sd$experiment <- rep("sean_410410", 57)
sean_sd$condition <- rep("Baseline", 57)

# Combine the preformatted tidy data with Sean's
tidydf <- suppressWarnings(full_join(tidydf, sean_sd))
```

```
## Joining, by = c("condition", "std_dev", "mean_R", "experiment")
```

```
# Fix the standard deviations and Rs to a set unit
fixed_sd <- c(
    subset(tidydf, tidydf$experiment == "cata_cali")$std_dev,
    subset(tidydf, tidydf$experiment == "jodie_cali")$std_dev,
    subset(tidydf, tidydf$experiment == "tbuooh_fit")$std_dev * 1000,
    subset(tidydf, tidydf$experiment == "sean_410410")$std_dev * 1000
)/1000

tidydf$std_dev <- fixed_sd

tidydf$mean_R <- tidydf$mean_R/1000
# Print out the final product
knitr::kable(summary(tidydf))
```

condition	std_dev	mean_R	experiment
Length:220	Min. :0.003556	Min. :0.6629	Length:220
Class :character	1st Qu.:0.010470	1st Qu.:1.0000	Class :character
Mode :character	Median :0.015721	Median :1.0000	Mode :character
NA	Mean :0.016143	Mean :1.4886	NA
NA	3rd Qu.:0.018865	3rd Qu.:1.0379	NA
NA	Max. :0.061509	Max. :5.3559	NA
NA	NA	NA's :128	NA

```
knitr::kable(unique(tidydf$experiment), col.names = c("Experiments"))
```

Experiments
cata_cali
jodie_cali

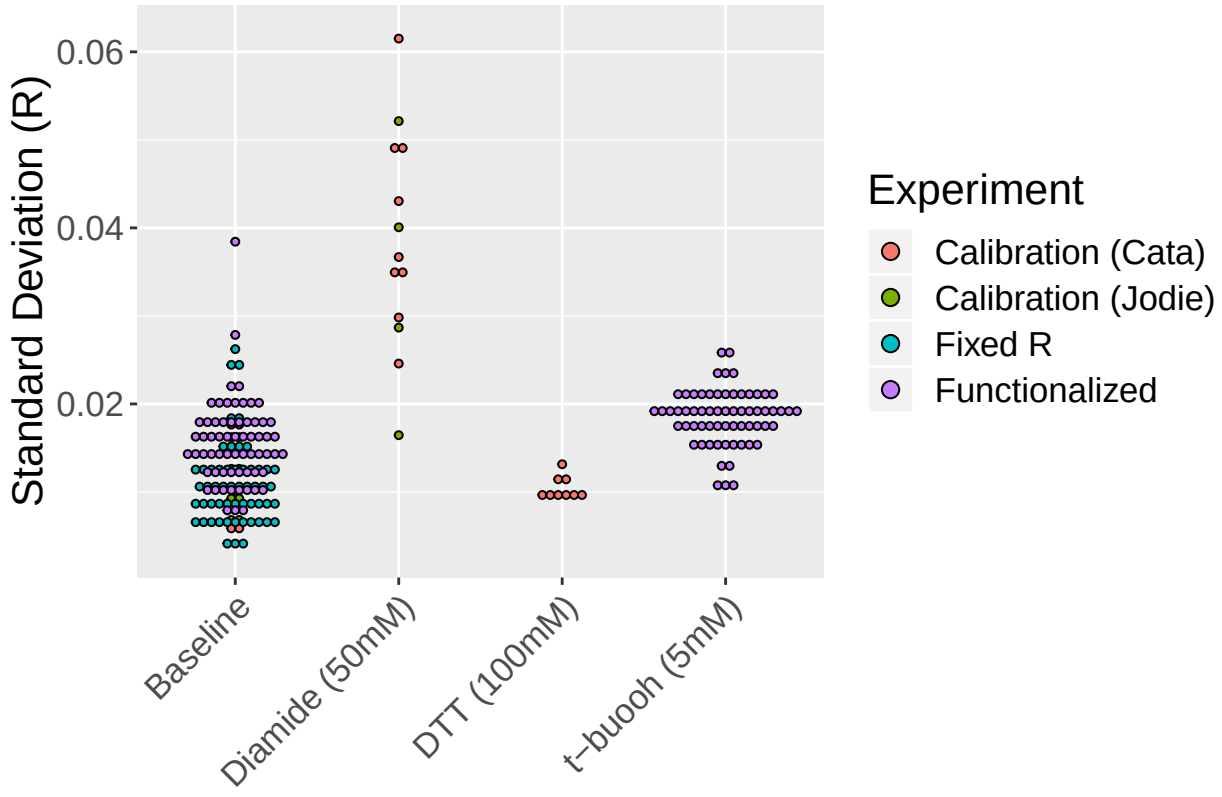
Experiments
tbuooh_fit
sean_410410

```
knitr::kable(unique(tidydf$condition), col.names = c("Conditions"))
```

Conditions
Baseline
Diamide_50mM
DTT_100mM
tbuooh_5mM

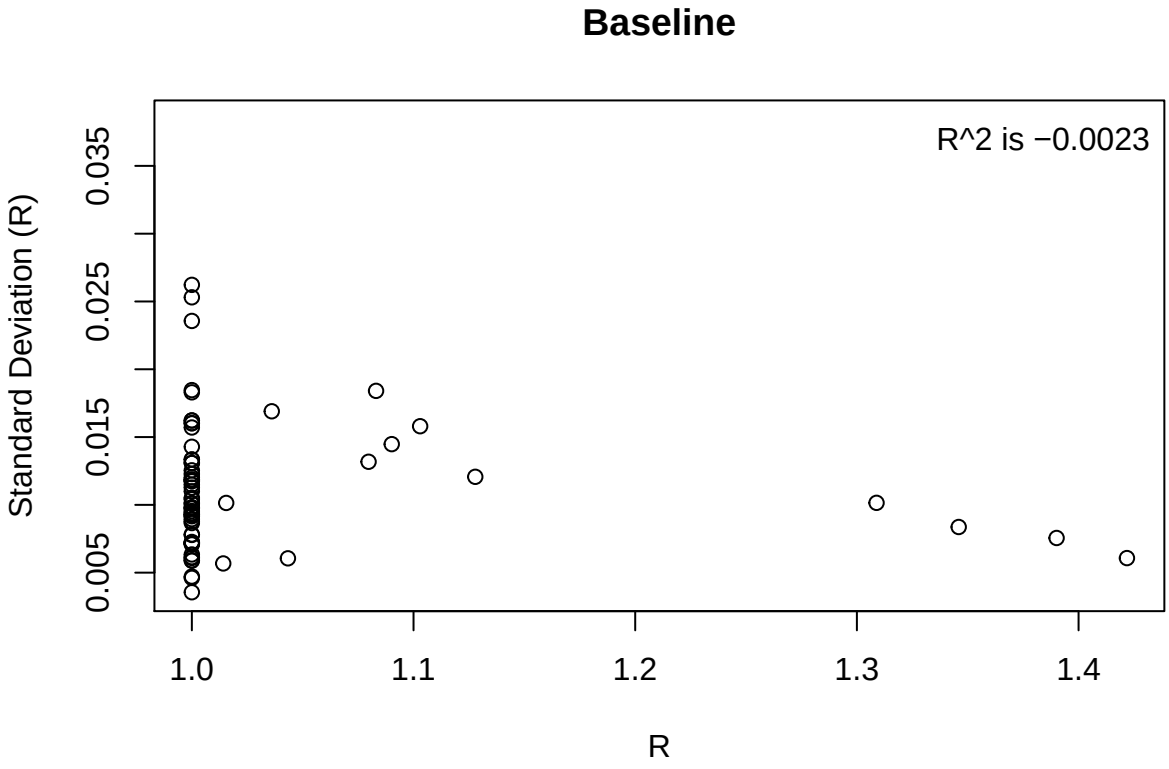
Standard deviations between conditions

```
ggplot(tidydf, aes(x = factor(condition), y = std_dev, fill = experiment))+
    geom_dotplot(binaxis = 'y', stackdir = 'center',
                 dotsize = 0.5, binwidth = 0.0018) +
    scale_fill_discrete(name = "Experiment", labels =
                            c("Calibration (Cata)", "Calibration (Jodie)",
                              "Fixed R", "Functionalized")) +
    xlab("") +
    scale_x_discrete(labels = c("Baseline", "Diamide (50mM)",
                                "DTT (100mM)", "t-buooh (5mM)")) +
    ylab("Standard Deviation (R)") +
    theme(text=element_text(size = 16),
          axis.text.x = element_text(angle = 45, hjust = 1))
```

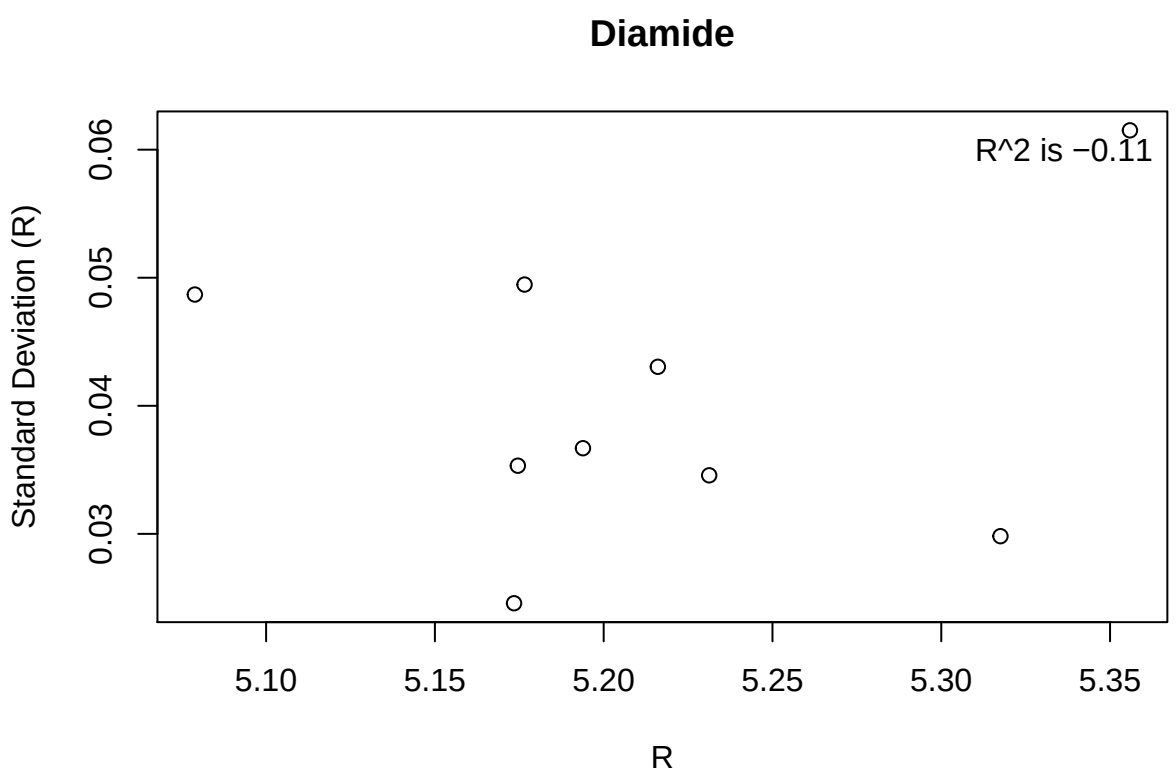


Within conditions, R and standard deviation seem independent

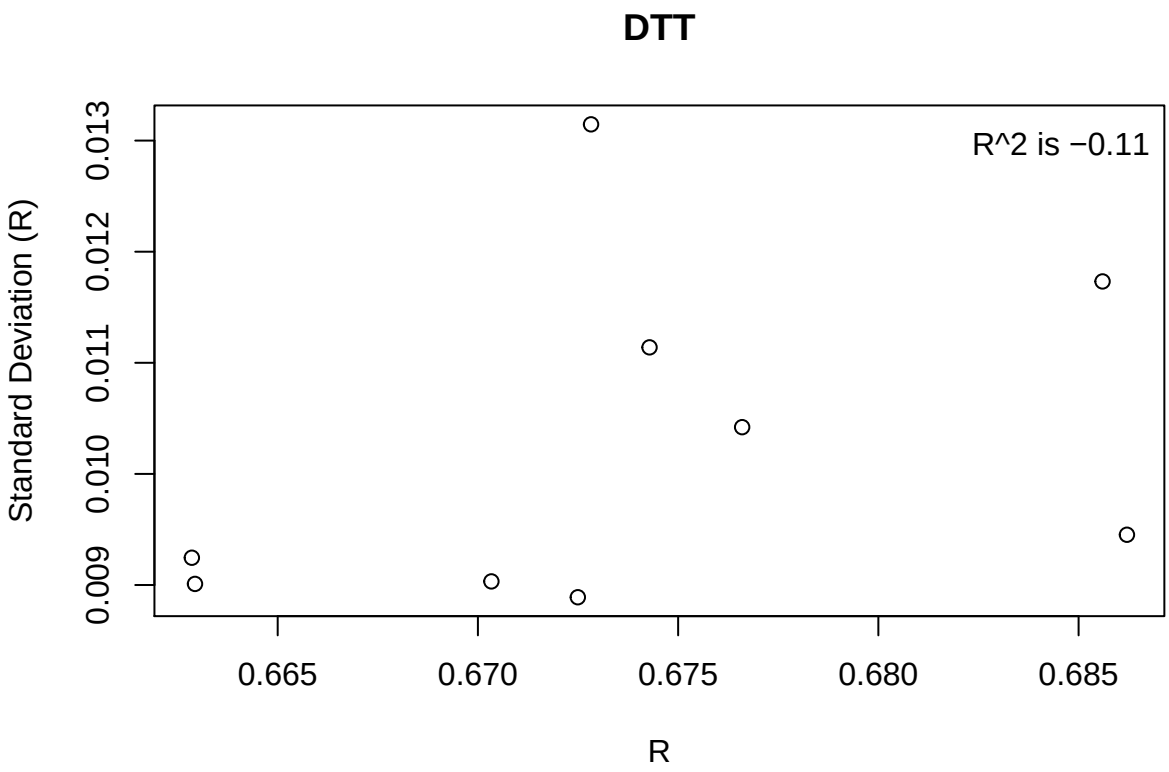
```
tidydf_baseline <- subset(tidydf, tidydf$condition == "Baseline")
plot(tidydf_baseline$std_dev ~ tidydf_baseline$mean_R,
     xlab = "R", ylab = "Standard Deviation (R)", main = "Baseline")
legend("topright", bty="n", legend=paste("R^2 is",
        format(summary(
            lm(tidydf_baseline$std_dev ~
                   tidydf_baseline$mean_R))$adj.r.squared, digits=2)))
```




```
tidydf_diamide <- subset(tidydf, tidydf$condition == "Diamide_50mM"
                         & tidydf$experiment == "cata_cali")
plot(tidydf_diamide$std_dev ~ tidydf_diamide$mean_R,
      xlab = "R", ylab = "Standard Deviation (R)", main = "Diamide")
legend("topright", bty="n", legend=paste("R^2 is",
        format(summary(
            lm(tidydf_diamide$std_dev ~
                   tidydf_diamide$mean_R))$adj.r.squared, digits=2)))
```




```
tidydf_DTT <- subset(tidydf, tidydf$condition == "DTT_100mM")
plot(tidydf_DTT$std_dev ~ tidydf_DTT$mean_R,
      xlab = "R", ylab = "Standard Deviation (R)", main = "DTT")
legend("topright", bty="n", legend=paste("R^2 is",
        format(summary(
            lm(tidydf_diamide$std_dev ~
                   tidydf_diamide$mean_R))$adj.r.squared, digits=2)))
```


DTT
R^2 is −0.11
Standard Deviation (R)
0.009
0.010
0.011
0.012
0.013
0.665
0.670
0.675
0.680
0.685
R