Access Wideband Audiology Immitance database using R and dplyr (Voss PI)

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```
library(mosaic)
library(RMySQL)
```

```
## Loading required package: DBI
```

```
db <- src_mysql(dbname = "wai", host = "scidb.smith.edu", user = "waiuser",
          password="smith_waiDB")
Measurements <- tbl(db, "Measurements")
PI_Info <- tbl(db, "PI_Info")
Subject <- tbl(db, "Subject")
```

Let's explore the `PI_Info` table.

```
PI_Info %>% collect() %>% data.frame()
```

```
##      Identifier PI_Year                                        PI
## 1     Voss_2014    2014                   Susan Voss;Abur;Horton
## 2 Rosowski_2012    2012                            Rosowski, J.J.
## 3    Voss_ASA14    2014 Susan E. Voss; Defne Abur; Hiwot Kassaye
##
## 1
## 2 Eaton-Peabody Laboratory, Massachusetts Eye and Ear Infirmary, Boston; Department of Otology and La
## 3
##                            Email
## 1                 svoss@smith.edu
## 2 John_Rosowski@meei.harvard.edu
## 3                 svoss@smith.edu
##                                                                                          Title
## 1                                                 Intrasubject Variability in Power Reflectance
## 2             Ear-Canal Reflectance, Umbo Velocity, and Tympanometry in Normal-Hearing Adults
## 3 Comparisons of reflectance measurements across measurements sessions, instruments, and ages
##                               Pub       Date
## 1              J Am Acad Audiol 10/04/2014
## 2                 Ear & Hearing 11/06/2015
## 3 Acoustical Society of America       2014
##                                                        URL
## 1 http://www.ncbi.nlm.nih.gov/pubmed/?term=abur+voss+2014
## 2             http://www.ncbi.nlm.nih.gov/pubmed/21857517
## 3                    http://dx.doi.org/10.1121/1.4877464
##
## 1
## 2 HearID (Mimosa Acoustics); \nNormal Criteria as follows: \n(1) There was no history of significant
## 3
```

Let's explore the `Subjects` table.

```
Subject %>% collect()
```

```
## Source: local data frame [52 x 11]
##
##       Identifier Sub_Number Session_Total   Age Female  Race Ethnicity
##            (chr)      (chr)         (int) (int)  (int) (int)     (int)
## 1      Voss_2014          1             4    20      1     0         0
## 2      Voss_2014          2             8    20      1     0         0
## 3      Voss_2014          3             7    21      1     0         0
## 4      Voss_2014          4             4    20      1     0         0
## 5      Voss_2014          5             4    19      1     0         0
## 6      Voss_2014          6             6    20      1     0         0
## 7      Voss_2014          8             3    20      1     0         0
## 8      Voss_2014          9             4    22      1     0         0
## 9  Rosowski_2012          3             1    30      1     5         2
## 10 Rosowski_2012          6             1    29      0     5         2
## ..           ...        ...           ...   ...    ...   ...       ...
## Variables not shown: Left_Ear_Status (int), Right_Ear_Status (int),
##   Sub_Notes (chr), ID (dbl)
```

Let's explore the `Measurements` table.

```
Measurements %>% summarise(total = n())
```

```
## Source: mysql 5.5.47-0ubuntu0.14.04.1 [waiuser@scidb.smith.edu:/wai]
## From: <derived table> [?? x 1]
##
##     total
##     (dbl)
## 1  107226
## ..    ...
```

Let's download the data from a given subject

```
onesubj <-
  Measurements %>%
  filter(Identifier=="Voss_2014", Sub_Number==1) %>%
  collect %>%
  mutate(SessionNum = as.factor(Session))

head(onesubj)
```

```
## Source: local data frame [6 x 12]
##
##   Identifier Sub_Number Session Left_Ear   MEP Instrument Ear_Area  Freq
##        (chr)      (chr)   (int)    (int) (chr)      (int)    (chr) (dbl)
## 1  Voss_2014          1       1        0     0          1      NaN   211
## 2  Voss_2014          1       1        0     0          1      NaN   234
## 3  Voss_2014          1       1        0     0          1      NaN   258
```

```
## 4  Voss_2014          1       1        0     0          1      NaN   281
## 5  Voss_2014          1       1        0     0          1      NaN   305
## 6  Voss_2014          1       1        0     0          1      NaN   328
## Variables not shown: Absorbance (dbl), Zmag (dbl), Zang (dbl), SessionNum
##   (fctr)
```

and plot the results

```
xyplot(Absorbance ~ Freq | SessionNum, group=Left_Ear, auto.key=TRUE,
       scales=list(x=list(log=TRUE)), cex=0.2, data=onesubj)
```