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#script for bone remodelling calculation
print("SOFTWARE FOR BONE REMODELLING CALCULATION: BR 1.0")
print("SELECT THE APPLICATION")
selector<-"NA"
while(selector!=0){
  system("clear")
  repeat{
    print("MENU")
    print("Press de number of the item selected")
    print("1-CALCULATE DOSE OF FLUORIDE")
    print("2-CALCULATE FLUORIDE INGESTED BY WATER")
    print("3-CALCULATE BONE FORMATION AND RESORPTION")
    print("4-HELP")
    print("0-QUIT")
    try(selector<-as.numeric(scan(file = "", what = "",nmax=1)),silent=TRUE)
    try(if(selector==0|selector==1|selector==2|selector==3|selector==4){break})
  }

  if(selector==1){
    print("Press de number of the item selected")
    print("1-HUMAN BEINGS")
    print("2-RATS")
    specie<-as.numeric(scan(file="",what="",nmax=1))
    if(specie==1){
      print("INTRODUCE FLUORIDE CONCENTRATION OF SOLUTION IN mole/L.
SUGESTED CONCENTRATION: 0.5 mole/l")
      fconcentration<-as.numeric(scan(file="",what="",nmax=1))
      volumehuman<-250/(fconcentration*1000)
      writeLines(paste("VOLUME OF FLUORIDE CONCENTRATION TO BE
ORALLY ADMINISTERED:" , round(volumehuman,digits=2)," ml"))
      writeLines(paste("D OF FLUORIDE TO BE ORALLY ADMINISTERED: 250000
nmole"))
      readline("TAKE NOTE OF THE VOLUME AND PRESS ENTER")
    }
    if(specie==2){
      print("INTRODUCE FLUORIDE CONCENTRATION OF SOLUTION IN mole/L.
SUGESTED CONCENTRATION: 0.085 mole/l")
      fconcentration<-as.numeric(scan(file="",what="",nmax=1))
      print("INTRODUCE BODY WEIGHT OF RAT IN grams")
      bw<-as.numeric(scan(file="",what="",nmax=1))
      volumerat<-0.0002*bw/fconcentration
      writeLines(paste("VOLUME OF FLUORIDE CONCENTRATION TO BE
ORALLY ADMINISTERED:" , round(volumerat,digits=2)," ml"))
      writeLines(paste("D OF FLUORIDE TO BE ORALLY ADMINISTERED: " ,
round(fconcentration*1000000/volumerat,digits=0)," nmole"))
      readline("TAKE NOTE OF THE VOLUME AND PRESS ENTER")
    }
  }

  if(selector==2){
    print("INTRODUCE WATER FLUORIDE CONCENTRATION IN mg/L (ppm)")
    waterconcentration<-as.numeric(scan(file="",what="",nmax=1))
  }
}

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print("INTRODUCE VOLUME OF DAILY WATER CONSUMPTION IN LITRES")
watervolume<-as.numeric(scan(file="",what="",nmax=1))
I<-waterconcentration*watervolume*1000000/19
writeLines(paste("FLUORIDE INGESTED BY WATER:" , round(I,digits=0)," nmole"))
readline("TAKE NOTE OF FLUORIDE INGESTED BY WATER (I) AND PRESS
ENTER")
}

if(selector==3){
print("INTRODUCE V1 IN mL")
V1<-as.numeric(scan(file="",what="",nmax=1))
print("INTRODUCE t1 IN min")
t1<-as.numeric(scan(file="",what="",nmax=1))
print("INTRODUCE F1 IN nmole/L")
F1<-as.numeric(scan(file="",what="",nmax=1))
print("INTRODUCE V2 IN mL")
V2<-as.numeric(scan(file="",what="",nmax=1))
print("INTRODUCE t2 IN min")
t2<-as.numeric(scan(file="",what="",nmax=1))
print("INTRODUCE F2 IN nmole/L")
F2<-as.numeric(scan(file="",what="",nmax=1))
print("INTRODUCE D IN nmole")
D<-as.numeric(scan(file="",what="",nmax=1))
print("INTRODUCE I IN nmole")
I<-as.numeric(scan(file="",what="",nmax=1))
BF<-F1*V1/t1*((D/((F2*V2)-(F1*V1*t2/t1)))-1)
BR<-(F1*V1/t1*(D/((F2*V2)-(F1*V1*t2/t1))))-I/t2
writeLines(paste("Bone formation: ", round(BF,digits=4), " nmole/min"))
writeLines(paste("Bone resorption: ", round(BR,digits=4)," nmole/min"))
readline("PRESS ENTER TO CONTINUE")
}

if(selector==4){
print("CONTACT Dr. Alfredo Rigalli, arigalli@unr.edu.ar or Dra. Maela Lupo,
maela_lupo@hotmail.com")
readline("PRESS ENTER TO CONTINUE")
}

}
suppressWarnings(try(rm(selector,fconcentration,volumehuman,volumerat,waterconcentration,wate
rvolume,I, V1,t1,F1,V2,t2,F2),silent=TRUE))

print("THANK YOU FOR USING BR 1.0")

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