

The College of
Natural Sciences and Mathematics

University of North Carolina

The 16th Annual

Research F

Poster Symposium

Abstracts

April 23, 2010

2:00 - 4:00 p.m.

2:00 - 4:00 p.m.

2:00 - 4:00 p.m.

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r) /2%+ \$22%99&/ - 1+\$"12%" . ' G"1A' A%' 2+2'+2**+&*) - F/\$%/("5@**1\$*/&*/992"2)5B/*%%" "
% . /2/" /R%&/ - /" * \$ (+%+ \$23""V/" . @A' % . /2+P/"% . /" = ' (+) - ch@(&' ; /\$"YR* . 1\$; /&"X<hYZ"
,1- +9@"" , "1\$%A' &%/&2"A91@2"1** /\$%&19&' 9/" +\$% . /"15+9+%@" , *1\$*/&*/992"" "A&' 9+ /&1%/" +\$"
1\$1*+ (+*1\$ (" . @A' R+*/\$F+&' \$- /\$%3""4. +22%) (@+2" (/2+; \$/ ("%" "(+2*/&\$% . /" ,) %*%+ '\$' , "
<hY! D<hYJ D"1\$ ("<hYM"+\$+\$%&1*/99)91&"Ah"&/;)91%+ '\$+\$> : SI "*" /992"X.) - 1\$5&/12%"
1 (/ \$' *1&+ \$' - 1Z"1\$ (" . ' G"* /992"1&/") %9+P+\$; % . /2/" +2' , ' &- 23"

4. /"<hY! D"J D"1\$ ("M"+2' , ' &- 2"/R* . 1\$; /"+\$%&/&\$19"h=" , ' &/R%&/&\$19"<1="G+% . " ! T! "
2%+ * . + - /%&@+"\$1\$84E"+\$ (/A/\$ (/ \$%- 1\$\$/&"1\$ ("1&/"/R%&/ - /9@"/ , , +*+ /\$%"1"
- 1+\$%1+\$+\$; "+\$%&1*/99)91&"AhD% .)2"- 16+\$; "9+6/9@**1\$ (+ (1%/2' , ' &"Ah"&/;)91%+ '\$+\$% . /"
%) - ' &- +*&' /\$F+&' \$- /\$%3""V . ' 9/"**/991\$ (" - / - 5&1\$/5')\$ ("<hY"15)\$ (1\$*/"G+99"5/"
1\$19@P/ ("1,%&/RA' 2)&/"% "1*+(+*1\$ (c' &. @A' R+***' \$ (+%+ \$2+\$"" &(/&"% " (/ %&- +\$/"
% %19"A&' %/+ \$"15)\$ (1\$*/"1\$ ("A' 22+59/"%&1 , , +*6+\$; "% % . /"A912- 1"- / - 5&1\$/3""4. +2"
2%) (@G+99"199' G")&"915%" "/9) *+ (1%/ "1"512+*)\$ (/&2%1\$ (+\$; "" , "% . /"&' 9/"
2' (+) - c. @(&' ; /\$"/R* . 1\$; /"A91@2"+\$+\$%&1*/99)91&"Ah"&/;)91%+ '\$ D"1\$ (")9%+ - 1%/9@"
%) - ' &*/992)&F+19+\$% . +2". 1&2. "- +*&' /\$F+&' \$- /\$%3"

- ' !32/@%&, !#* @!, #%2G#!. /' O' +&!3/' U+6!2*!*' +' @' *+2@!
: #+&/ . 2%#/#/, !
"
+*8. 724'E. . &

: 1%/&A+991&2"+\$%. /", 1- +9@"<' %' (' \$%+(1/" ,%/\$" . /G",)&&' G2"1&')\$ ("9/1,"A/%+' 9/2" &"
2%/- 23"4. +2"; +&(9+\$; "5/. 1F+' &". 12"5//"\$&/A' &%/ ("+"2/F/\$"\$' %' (' \$%+("2A/*+/2", //(+\$; "

2A/*+/2D+\$*9) (+\$; "' \$/'" , "' \$2/&F1%+ '\$*' \$*/&\$D'G/&/'" 52/&F/ ("+\$"% . /"\$1%)&/'&/2/&F/"
G+% . "\$1%+F/"F/; /%1%+' \$3"

"

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" 6&!&((&: +!' (!64@/' . &/2' @!#* @!2*G&/+&\$/#+&!(&&@2*3!' *!%&#(!
@&: ' O. ' , 2+2' *!/#+&, !2*!2*+&/O2++&*+!^Y#/K!, +/&#O, !

"

?2#*-'!;'G%N"

"

#\$/&- +%/ \$"2%&/1- 2". 1F/"1". @(&' A/&+' ("% . 1%"2"&/;)91%/("5@"% . /"&/91%+F/9@"
A&/ (+*%159/"*9+- 1%/" , "1"&/; +' \$3""h' G/F/&D'A&/ (+*%+' \$2"512/(" \$"; 9' 519"*9+- 1%/"

alter the toxicity of nitrate. The 96-hour LC50 (concentration that kills 50% of organisms) values with and without the presence of atrazine are 69.8 and 87.2 mg/L NO₃-N respectively. Post-test growth and behavioral observations (10-day period) conducted with adult following 96-

N2: 6&!1 /&#@+6!#* @!- 2&+!A* #4, 2, !' (!+6&!N' /+6&/ *!
9* #K&6&#@!2*!1/2* K%&4!A/K#* , #, !

B277-'3%, 4270#. &'2&0'?-)*'E**D"

Effects of the protein kinases, CaMKII, PKA, and PKG on the sarcoplasmic reticulum Ca²⁺-ATPase pump expression

Stuart Sherwood, Andrey E. Reed, and Tramaine Shepard

A high cytoplasmic Ca²⁺ concentration in coronary artery smooth muscle cells induces arterial constriction which can limit blood flow to the heart. The lack of blood flow to

densities will provide a thorough assessment of potential effects of drilling on the diverse fish assemblages in headwater streams of north central Arkansas.

"
"

- ' &, !JG' %8+2' *!0*, +/8: +2' *!J%2: 2+!#*!JO' +2' *#%D&, . ' * , &!2*!

9+8@&*+, _!
"

: \$*542&%*6*\$*7/ 2&'2&0'!. #4' ())*&"

= ' G&O&*+!/?#++&/*, !#* @!J *G2/' *O&*+##!0*(%8&*:&! (' U' !
)4. /2*2@, !2*!#*!0*+&/O2++&*+!D&#: 6! ('!#*!^Y#/K!9+/&#O!

3%, 4270'J 2)D*7"

E&/F+')2"&/2/1&*. "+\$A/&/\$\$+19". /1(G1%/"2@2%/- 2". 12"2. ' G\$%. /"- 1B' &+%@"' ', +2. /2"
/R. +5+%&/2%&+*%/("- ' F/- /\$% ". ' G/F/&D', /G"2%) (+/2". 1F/"%/2%/("% . /"&/2%&+*%/("
- ' F/- /\$% ". @A' %. /2+2"\$1\$"+\$%/&- +%/%\$%2%&/1- "G. /&/"&/2')&*/"1F1+915+9+@+2" ', %/\$"
A1%*. @"&/91%+F/"% "A/&/\$\$+19"2%&/1- 23" [)&"' 5B/*%+F/2"G/&/"% " /R1- +\$/- ' F/- /\$% "
A1%"/&\$2" ', 2')%. /&\$"&/ (5/99@) (1*/"X Z"1\$ ("*&/6"* .)5"
X ZD"G' "2- 199N5' (+/ (" ,+2. /2"*' - - ' \$"+\$"1" `k` f- "&/1* . "' , "1\$"
+\$%/&- +%/%\$% ". /1(G1%/"2%&/1- "1\$ ("%' " (/%/&- +\$/ "% . /" /\$F+&' \$ - /\$%19", 1*%' &2"
+\$, 9) /\$*+\$; "% . /2/" - ' F/- /\$%A1%"/&\$23""8%" %19" ', "Kl KK" "1\$ ("K^7"
"G/&/"%1; ; / ("G+% . "/912%" - /&" F/&%. /" ,+&2%"G' "21- A9/"%&+A23"" : 1A%)&/"
/ , , +*+/\$*@"G12". +; . , ' &"5' % . " "Xkl l Z"1\$ (" "Xkl l Z"1\$ ("

D&#: +2' * , !' (!R*`V⁵9W!U2+6!)E

"
"

9: /&&*2*3!' (!. /' +&2*, !+' !+&, +!(' /!: ' //&%#+2' *!' (!. 6' , . 6#+&!
: ' %/#. , &!#/ ' 8*@!: #+2' *2:!. /' +&2*!/&, 2@8&, !#*@!- NA!
\$&*@2*3!
,

0*G&, +23#+2*3!+6&!2*+&/#: +2' *!\$&+U&&*!= 35`!#* @!+6&!:/4, +#%
@&64@/#+2*3!#3&*+!5QO&+64%Q5P>Q. &*+#+&@2' %V=?- W!#* @!2+, !
/' %&!2*!- NA!\$&* @2*3"

C. "7\$&* -'B"KK>6. 7%+" &)25>2&O'!20*'?'%&A"

"

4. +2"A&' B/*%, ' *)2/2" \$"/RA91+\$+\$; "%./"- /*. 1\$+2- "5@"G. +*. ">EO"1,,/*%2"O<8"
5/\$(+;\$; "1\$(D'2A/*+, +*199@D'+\$F/2%+; 1%/2"G. /%. /&">EO"* . /91%/2">; Js'+ '\$23"#, "O<8"
5/\$(+;\$; "+2"+\$()*/("5@"*1%+' \$"5+\$(+;\$; D"%./"\$* . /91%+' \$"" , ">; Js"5@">EO"*')9("'
2/Q)/2%/&"%. /"+ '\$2"1G1@, &' - "%./"O<8D"%./&/5@"(/*&/12+\$; "%2"*)&F1%)&/3"4' "%/2%"%. +2"
. @A' %./2+2D"*' - A/%+%' \$"/RA/&+- /\$%2"5/%G//"\$>EO"1\$ ("1\$"+\$ (+*1%' &D'Y&+' * . &' - /"
C91*6"4"XYC4Z", ' &">; Js"+ '\$2D'. 1F/"5//"\$)2/("%' "%/2%", ' &"%. /">EON>; Js"* . /91%+' \$3'
=1- A9/2"*' \$%1+\$+\$; "YC4C">; Js"G+% . "F1&@+\$; "1- ')\$%2"" , ">EO"G/&/"A&/A1&/("1\$ ("'
1\$19@P/(")2+\$; "Li "2A/*%&' 2*' A@3"8\$"152' &51\$*/"G1F/9/\$; % . "- 1R+-)- 2. +, %"
' &&/2A' \$(+;\$; "%' "%./"' 9' &"%&1\$2+%' \$", &' - "A+\$6%" "59)"/"+\$ (+*1%/2"*' - A/%+%'F/"
&/- ' F19"5@">EO"" , ">; Js", &' - "YC43"4. +2"%&1\$2+%' \$". 12"5//"\$(/%/*%/"("1\$ ("Q)1\$%+, +/ ("'
5@"- ' \$+%&+\$; "152' &51\$*/"F19)/2"1%"F1&+')2">EO"*' \$*/\$%&1%+' \$2"1%"G' "

c0, %0D&+2*' 2@!A: 2@!0* @8: &, !0* +&3/2*00* @&. &* @&* +!
A@6&, 2' *!U62%&!- #O. &*2*3!?' /' %2(&/# +2' *!2*!9&%&: +!F8O#*!
0008* &!)&%%, !

!

Kaitlin S. Merrell

#- -)\$/" */99" 1(. /2+' \$" 1\$(" A&' 9+, /&1%+' \$" +2" /22/\$%+19" , ' &" A&' A/&" +- -)\$+%@3"
#- 5191\$*/ (" 1(. /2+' \$" 1\$(c' &" A&' 9+, /&1%+' \$" *1\$ 9/1 (" % " * . &' \$+*" +\$, 91- - 1%+' \$" ' &"
+- -)\$' N2)AA&/22/ ("2%1%/23"KN "?/%+\$' +*"8*+("XkN N?8ZD"1"(/&+F1%+F/" , "i +%1- +\$"8D"
19%/&2"; /\$/" /RA&/22+' \$"1\$("+- A1*%2"*/99" A&' 9+, /&1%+' \$D" (+, /&/\$%+1%+' \$D"1\$("1(. /2+' \$3"
#\$" % . +2" 2%) (@D" G/" +\$F/2%+; 1%/" (%. /" 1(. /2+F/" 1\$("A&' 9+, /&1%+F/" /, , /*%2' , "KN N?8" ' \$"
-)9%+A9/" .) - 1\$" +- -)\$/" */99" 9+\$ /23" []&" &/2)9%2" /2%159+2. " % . 1%" k

"

"

4G/\$%@"*. /- +*192"G/&/"Q)1\$%+,+/("1%"\$; cd"9/F/92",&' - "1; &+*)9%)&190"+\$()2%&+190"1\$ (" &/2+(/\$%+19"2')&*/23" 4&+1P+\$/" 1\$ (" ' &; 1\$' *. 9' &+\$/" A/2%+*(/2" 1\$ (" % . /+&" (/; &1(1%+ '\$ A&' () *%2" G/&/" % . /" - ' 2%" *' - - ' \$9@" (/ /%*/ (" *9122/2" ' , " * . /- +*1920' , ' 99' G/(" 5@ * . 9' &' 1*/%1\$+9+(/" A/2%+*(/2" 1\$ (" A' 9@*+*9+* " 1&' - 1%+*" . @(&' *1&5' \$23" 4G' " 5+ ' 1**) -)91%+F/" *' - A') \$(20' (+/9(&+\$" 1\$ (" . /A%1* . 9' &" /A' R+(/0' /R**/((" YE8" *&+%/&+1" , ' &" % . /" A&' %/*+ '\$ ' , " 1Q)1%+*" 9+ /3" 4. /2/" &/2)9%2" G+99" , / (" (+&/*%0@ " +\$% " +- A&' F+\$; "91\$(N)2/"A&1*%+*/23"

"
"
"

JX: 6#* 3&!&e82%2\$/2#!' (!G#/2#\$%&!*2+/' 3&*Q@' *' / , !#+!

*2: K&%\00WQ, : ' / . 2' *#+&, !

?7%#\$%&' (;64. 79%)# . &>'(0*'M#%&. = . "

"

<+*6/9X##Z"(/- '\$2%&1%/2"1". +; . "1,,+\$+%@"; '&"+%&' ; /\$N(' '\$ '&512/23""8**' &(+;\$; 9@0"
4Av<+s"&/F/&2+59@"5+\$ (2<N(' '\$ &2"1**' &(+;\$; "%' "% . /"&/1*%+ '\$T""4Av<+u""s""M"<N(' '\$ &""
a4Av<+X<N(' '\$ &Zmbu0"G. /&/"<N

0* +&/G#%l" 2O&!9&/2&, !?/&@2: +2' *!S, 2* 3!0* +&/G#%l9+': 6#, +2:!
= ' @&%, !

I 292&'3. -'E27" 52))- '2&0'+ *9*&027': %&A%7*00-

"

O+2%+\$*%F/"1\$("\$) \$+Q)/"A&' 59/- 2"+\$2%1%+2%*19"- ' (/9+\$; "1\$ ("+\$, /&/\$*/"1&/"; /\$/&1%/" % . &'); . "1\$ "1\$19@2+2" , "/RA/&+- /\$%19" (1%1"% . 1%. 1F/"5//\$" 52/&F/ ("1% (+, /&/\$%A' +\$%2" +\$%+- /3"4. /"1AA9+*15+9+%@" , - 1\$@%&1 (+%+ '\$19"2%1%+2%*19"- ' (/92"+2"2/F/&/9@9+- +%/ (0"12" % . /@" 122) - /" 1 (81*/\$%" ' 52/&F1%+' \$2" %' " 5/" +\$ (/A/\$ (/ \$" 1\$ (" +(/\$%+*199@" (+2%&+5)%/ (3" 4. +2" &/2/1&*. "A&' A' 2/2"%G' "%/* . \$+Q)/2' , &"A&/ (+*%+\$; "1\$"+\$%&F19"%+- /"2/&+23" 4. /" ,+&2%" - /%. ' (" +2" 512/ (" ' \$" /RA9' +%+\$; " *' &&/91%+' \$" 12" 1" A. /\$' - /\$' \$" % . 1%" - 1@ 5/" ; /\$/&1%/" % . &'); . " 9+\$ /1&" 91; ; / (" &/91%+' \$2" 9/1 (+\$; " %' " #\$/&F19" 8)%' " ?/; &/22+F/" >' F+\$; " 8F/&1; /" X#8?>8Z3" 4. /" 2/*' \$ (" +2" 512/ (" ' \$" . 1\$ (9+\$; " \$' \$2%1%+' \$1&+%@" +\$"

&/;)91%+' \$" , ' &" G+&/9/22" F+(/' " 1AA9+*1%+' \$20" G/" +\$F/2%+; 1%/ " % . /" B' +\$%" (/2+; \$" ' , "
h3J7Kc=i : N>#> [" &1%/ " *' \$%&' 93" V/" A&' A' 2/" 1" 2@2%/- " 1&* . +%/*)&/" , ' &" h3J7Kc=i : "
*' - A&/22+' \$" 1\$ (" %&1\$2- +22+' \$" ' F/&" >#> [" 2@2%/- 23' []&" 2+-)91%+' \$" &/2)9%2"
(/- ' \$2%&1%/ " % . 1%" ')&

= ' @&%2*3!S*: &/+#2*+4!' (!C/' U+6!D#+&!U2+6!0*+&/G#%!" 2O&!
9&/2&,!

G29**&': %&A%7*00->'324")'6202>': 7%32/'<. 882"

L\$*/&%1+\$%@"A91@2"1" - 1B' &"&' 9/"+"\$%. /",+/9(" , /*' \$' - +*2"1\$(", +\$1\$*/3"4. +2". 1AA/\$2"
- 1+\$9@" (/ " % " - /12)&/- /\$%+\$1***)&1*@"1\$ (" +\$*' - A9/%/" 6\$' G9/ (; /" ' , 1*%' &2"% . 1%"
- 16/2" +" (, , +*)9%" % " 1***)&1%/9@" A&/ (+*%" % . /" &/2)9%2" ' , " (+ , /&/ \$" +\$F/2%- /\$%23"
: ' \$F/\$%+' \$199@J")\$*/&%1+\$%@" +\$ " , +\$1\$*/" 1\$ (" /*' \$' - +*2" +2" (/2*&+5/ (" 5@" 2%1%+2%+*19"
- ' (/923" [\$/' ' , % . /" A&+- 1&@9+- +%1%+' \$2" ' , % . /"%&1 (+%+' \$19" A&' 515+9+2%+*" 1AA&' 1* . " +2"
% . 1%"% . /" /R1*%" A' +\$%F19)/2" ' , 199"% . /"&/9/F1\$%" A&' 515+9+%/2". 1F/"% " 5/" 6\$' G\$"5/ , ' &/"
. 1\$(3" h' G/F/&" +\$ " /*' \$' - +*2" 1\$ (" , +\$1\$*/" G/" (' " \$' % . 1F/" /\$'); . " 2%1%+2%+*2" % "
A&/+2/9@" (/ % /&- +\$/ " 199" % . /" \$//(/ (" A&' 515+(%) - O. 4/ (" +(6cmBT2(- +)OT(;) - O. 4(.)O. 2(/)C

0*+&/G#%I?/&@2: +2' *!(' /!+6&!9) AN!) %8, +&/2* 3!A%3' /2+6O!

"

R%&, * &\$'S%5'2&0': 2%\$: " *7"

"

#\$ - 1\$@" 1AA9+*1%+' \$" (' - 1+\$2" 1" ; &1A. " A&/2/\$%1%+' \$" ' , " F' 9) - +\$')2" (1%12/%" - 1@"

!

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D

M

- 4*#O2:!^8+. 8+!E&&@\$#:K!)' *+/' %%&/,!(' /!9+' /&

E/#: +#%, !#* @! ?%#* &!9400&+/2&, !

B2-)*-'E%)*7"

>3: 3"Y2* . /&02"1&%"2", 1- +9+1&%" - ' 2%A/' A9/D"9/22", 1- +9+1&"+2"% . 1% -) * . " , "%+2"512/ (" ' \$"% . /"V199A1A/&"; &') A23"8"; &') A"+2"1- 1% . /- 1%+*19" 5B/*%"% . 1%" (/2*&+5/2"% . /" 2@- - /%&+/2" , "2' - /% . +\$; 3#\$"-) * . " , "Y2* . /&02"1&%" . /"%9/2"% . /"A91\$/"G+% . "&/A/%+%"F/" A+*%)&/2"X/3; 3"8\$; /92"1\$ ("O/F+92Z3"4 . /2"/A+*%)&/2"1&/2" "' \$2%&) *%/("% . 1%"F1&+') 2" &' %1%+' \$2"1\$ ("&1\$291%+' \$2"5&+\$; 2"% . /"%9/2"51*6" \$%' "% . /- 2/9F/23"4 . /"*' 99/*%+' \$" , "199" 2) * . "&+; +("- ' %+' \$2"+2"% . /"; &') A"122' *+1%/("% "% . /"%9+\$; 3"4 . ') ; . "% . /&/"1&/1\$"+\$, +\$+%/ "\$) - 5/&" , "(+, , /&/\$%"9+\$; 2"/1* . "%9+\$; "+2"122' *+1%/("% "' \$9@"' \$/" , " ! I "(+, , /&/\$%" ; &') A2D"% . /"V199A1A/&"; &') A23"4 . /"A91\$/"*1\$5/"%9/("G+% . " , &1*%19"2 . 1A/23"4+9+\$; "G+% . " , &1*%192D"5/2+(/2"199' G+\$; " , ' &"&1\$291%+' \$2"1\$ ("&' %1%+' \$2D"192' "199' G2" , ' &2@- - /%&+/2" % . 1%"&/2*19/"% . /"A+*%)&/3"V/"A&' A' 2/"%' "/RA9' &/"% . /"A' 22+59/"2@- - /%&@; &') A2" 122' *+1%/("% "%9+\$; "% . /"A91\$/"G+% . " , &1*%19"2 . 1A/2"% . 1%*1\$5/"&/2*19/(3"

9. #+2#%& = ' @&%2* 3!' (!A/K#* , #, !- &&/!#* @!" 8/K&4!
?' . 8%#+2' * , !

!2#. &'E . 77%# '2&0'! . &2\$42&'! . 4&# . &"

4. /"8&61\$212"U1- /"1\$ ("S+2. ": ' - - +22+' \$"6//A2"%&1*6" , "% . /"\$) - 5/&" , "(//&"1\$ (" %)&6/@2"%16/\$" , ' &/1* . " .) \$%+;\$; "2/12' \$"1"%% . /"*') \$%@"9/F/93"V/"1AA9@"2A1%+19"- ' (/9+\$; " % " /RA9' +%"% . /"+\$. /&/\$%"2A1%+19&/91%+' \$2 . +A2"+\$"% . /" (1%1%" "' 5%1+\$. +; . "&/2' 9) %+' \$2" /2%+- 1%/2" , "% . /2/"%G' "A' A)91%+' \$2"F+1"1%/* . \$+Q) /"6\$' G\$"12"6&+; +\$; 3"4 . /"A1&%"*)91& +- A9/- /\$%1%+' \$"/- A9' @/(- 16/2")2/" , "\$' F/9"\$ \$NA1&1- /%&+*2/- +F1&+' ; &1- - /% . ' (2"&/2/1&* . /("5@%" . /">&3">' &&+2D">&3"j' . \$2' \$D"1\$ ("O&3": 1&- 1*63"=) * . " 1AA9+*1%+' \$2"*1\$5/")2/("% "%&1*6"2 . +,%2"+\$"1\$+- 19"A' A)91%+' \$2" F/&%"- /D"1\$ ("*')9(" 5/")2/("% " ;)+(/" .) \$%+;\$; "A' 9+*@" (/ *+2+' \$23"

X-Ray Fluorescence: Identification of Unknown Samples*

Renee Brock and Josh Lieblong

9. &: +/' , : ' . 4! ' (!) &. 6&2@!\#/2#\$%&!9+#/,!
"
!*7*/ - '(;1"#D'

- &+&/O2*#+2' *!' (!" 62*QE2%O!9#O. %&!'" 62: K* &, , !
!S, 2* 3!#!F &`!0' *!1 &#O!

()*, 'J 2\$#. &'2&O' (#2 / %G%#4%D2=2"

V. /\$"1\$+' \$"5/1- "" , "6\$' G\$"/\$/&; @"+2+\$*+(/\$%" \$"1"% . +\$N,+9- "21- A9/D"% . /"/\$/&; @"" ;
% . /"2*1%/%&/ ("A1&%+*9/2"*1\$"5/" - /12)&/ ("1\$ (")2/ ("%" " (/%/&- +\$/"% . /"% . +*6\$/22"" , "% . /"
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Changes in the Elemental Composition of Rat Leg Bones Subjected to Hind-Limb Suspension

Alec Watson

Hind-limb suspension, or HLS, is a NASA validated model of simulated weightlessness. This study examines whether the exposure of rats to HLS for a period of 1 or 2 weeks affects the relative ratios of elements in the leg bone tissue of the rats, with emphasis on the levels of calcium phosphate in the bones, one of the primary constituents that provides the 'hardness' of the bones. To determine the elemental composition, x-rays produced by a 20keV beam of electrons by a scanning electron microscope (SEM) were analyzed by computer software that recognizes the unique signature of x-rays produced by different elements. Changes in the ratios of elements in control vs. experimental rats were then determined. Results suggest that calcium phosphate is produced at the same rate in both groups, but without the minute amount of wear each step causes on bones in the HLS rats, there is an imbalance of calcium phosphate in the bone tissue, especially around the knee.

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, 7, 15, 21, 23, 24, 26, 34
, 7, 15, 23, 24, 26
, 49, 50, 52, 53

Adhikari, Saroj, 49

() * & > ! . # 4 , 25
() * & > ! " # \$ % & , 3
(5 2 \$ 2 > 1 2 3 4 . & 0 2 , 4
, 44

Atla, Abhinav Reddy, 38

, 49, 51
< 2) 0 = % & > ' : , 4
< * 7 7 - > ' ? % / 8 * 7) - ' E ; , 29
< * # *) > ' < 7 % 2 & ' E ; , 29

Bewley, Autumn, 5

, 13, 25
<) 2 & 0 > ! * \$ * , 49

Bobba, Sri Ram, 41

< . 8 8 2 > ' : 7 % 3 2 / 2 ' : 2 \$ - 2 ' ? 7 % # 4 & 2 , 40

Bonde, Ashley, 34

Branaman, Tatum, 16

, 4
, 33

Brock, Renee, 50

< 7 " / / * \$ \$ > ' : 4 2 = & , 6
, 47
< " 7 7 . = > B 2) * * , 6

Byrd, Jordan, 6

, 45
, 31
, 38

C 4 * & > ! % & A ' R . . & , 44

Chen, TsungYen, 34

, 4

Clarke, Heather J., 7

C) * / . & # > ' < 7 2 & 0 . & , 7

Cordova, Scott, 34

C . 7 D * & > ' (0 2 / ' 1 ; , 29
+ 2 9 % # > ' G % , 4 .) 2 # , 13

Delvasto, Jennyfer, 8

+ * # 7 . , 4 * 7 # > C) 2 % 7 * , 6
, 29, 35
+ % H % 2 , . / . > 3 * 8 * , , 2, 23

+ . " 7) 2 % & > @) % L 2 8 * \$ 4 , 30
+ " &) 2 5 > 6 . 7 % , 32

Dunning, Kelly, 6

, 13, 20
@ 0 / . & # . & > ' E % , 4 2 *) , 7
@ D 7 " \$ > + 2 9 % 0 , 44
, 9, 17, 18, 21
@ 7 8 2 , 4 > ' ? ; , 4

, 31

F % *) 0 # ' P P P > + 2 & % *) , 31
F) % # # > ! 2 , D # . & , 44
F . N > ! ; ' 6 -) * 7 , 34
, 50

Fuller, Chris, 9

H 2 \$ * # > ' G 2 0 % & * , 10
, 8

H 7 2 & \$ > ' < 7 - , * , 30
H 7 . K K > ' + ") , % & * 2 , 10

Havens, Tara, 19

B 2 = D % & # > ' 1 % L , 11
B * 7 8 # \$ > ' M) % 9 * 7 , 11
, 45

Hightower, Anthony T., 31

, 24

Hill, Kayla, 12

, 38, 39, 41, 42
B " 8 * 7 > ' E 2 \$ \$ 4 * = , 35
B " K K > ' C . " 7 \$ & * - , 32
B " 7) * - > ' ? -) * , 13
, 30, 32

! 2 / * # > ' (; 1 ; , 4

Jimmerson, Stephanie, 13

Johnson, Clint, 15

! . 4 & # . & > ! . & 2 \$ 4 2 & , 45

Johnson, Matthew, 38

, 32, 33
? %) A . 7 * > ' (; , 4
? % & A > ' < 7 2 & 0 . & , 7
? % & A > ! 2 0 * , 32

Kirkpatrick, Andrea, 32

Kluender, Edward R., 15

Knox, Nicole, 16
, 38, 42

