

!"#\$%&'()*+,-./:0123456789@ABCDEFGHIJKLMNO
PQRSTUVWXYZ[\]^_`{|}~!@#\$%^&*()<=>?&'

&

&

#!\$>"3%&/%4"??

&

&

3\$44+0\$!+%\$!*?&&



&

.@AB

&

#!\$>"3%&!+%/\$.+4"

Escherichia coli

#!\$>"3%&+/)?&

! \$ > " 3 % & \$ (% 3 \$) " * ? &



!"!#\$%&'()*#*+,-./%0-12#

32%(45-5#1.#06)#5%&'()-#2#7*!89:\$##

!"#\$%&'(")***%+,&-'./)*0'123456!'(/78'78&'#&789-'\$:9;/-&-'")#&*7/9*&-/'*78&'7"<%&'="**-'
-/)%)\$"+&- '1234'>8:9#"790:"#'"')-&\$/>7&-/'*?'/0.:&'=@A9')\$&&-'. \$'78&'\$:&%/#/*':+'**"%+))B'
#&789-'(")'#9-/?/&-'"')89(*/*'7"<%&'C'79')89:7&*78&'&7&*7/9*7/#&'79'CD'#/*'.7&)%'E/0.:&'C'
:&\$:&)&*7)'78&'1234'>8:9#"790:"# '9<7'/*&- '(/78'78&'#9-/?/&- '#&789-@''

!"#\$%&'() *#+\$%&, - ".%&/0''1+%23. &4. %I&5*0&3-%&6 789:) ; &. <.3%=&*>*2.+ .3+2/&*5&?@&) +\$\$+:A&"2I&
BC 'D&5*0=+& ">+I&"2I&E@&">%3*2+30+\$%&"2I&BC 'D&5*0=+& ">+IC&'FB&==&*>*4=2&G". &4. %IC&&

| ;-&)<&-2+0)5=# | >(1?<&(@&-2=# | 3 A # | BA # |
|----------------|---------------|-------|------|
| F*7/'%"' | G@H' | =GG' | G' |
| HG' | G@H' | HG' | IG' |
| HG@G=' | G@H' | J' | KJ' |
| HD@G=' | G@H' | J' | KJ' |
| HD@GC' | G@H' | =GG' | G' |
| LC@G=' | G@H' | =GG' | G' |

!"#\$%&'H() *#+\$%&, - ".%&/0''1+%23. &4. %I&5*0&3-%&6 789:) ; &. <.3%=&*>*2.+ .3+2/&*5&?@&) +\$\$+:A&"2I&
BC 'D&5*0=+& ">+I&"2I&E@&">%3*2+30+\$%&"2I&BC 'D&5*0=+& ">+IC&'FB&==&*>*4=2&G". &4. %IC&&

| ;-&)<&-2+0)5=# | >(1?<&(@&-2=# | 3 A # | BA # |
|----------------|---------------|-------|------|
| F*7/'%"' | G@D' | KJ' | J' |
| G@MG' | G@D' | KJ' | J' |
| C@GG' | G@D' | IG' | HG' |
| D@JG' | G@D' | CJ' | IJ' |
| I@GG' | G@D' | J' | KJ' |
| M@JG' | G@D' | KJ' | J' |

I+/40%k'(k6789k>-0*="3*/0"=k*#3"+2%Ikg+3-k3-%k=%3-*Ik=%23+*2%Ikg+2k!"#\$%&'Ck'FBk==k>*\$4=2k
G".k4.%Ikg"21k3*3"\$k042k3+=%kG".k.JHCB'k=+243%kG+3-k3-%k5\$*GkO''3%k*5kBCK=\$k,%Ok=+243%k

I+/40%kH(k6789k,% "LkG+3-k3-%k=%3-*Ik=*I+5+%Ikg*%k0%I4>%k3-%k0%3%23+*2k3+=%k3*kMCFk=+2CkFBk==k
>*\$4=2kG".k4.%Ikg"21k3*3"\$k042k3+=%kG".k.MCFk=+243%kG+3-k3-%k5\$*GkO''3%k*5kBCN=\$k,%Ok=+243%k

"

,

32%(45-5#1.#06)#5%&'()#-2#*,.)'9C*!8#

A8&')89:7' # &789-' (")'7:"*)?&::&-'79'2:&\$5N234'79'8";&'78&':&7&*7/9*'7/#&'9?'CD' #/* .7&'")'
 -/) \$%" +&-'/*'7"<%&'H@'48:9# "790:" # '0?/0. :&'HP')89 (&-'78"7'>&:7"/*'>9# \$9* &*7)'9?'78&') # \$%&'
)"7. : "7/*0'78&' -&7&>79: @'A9'0&7'78&'099-' -&7&>79: ':&)\$9*)&B'?%9 ('>&%%' (")>8"*0&-'79'9* &' (/78'
 G@J # # '\$"78'%&*078@'A8&'>8:9# "790:" # '9<7"/* &-' (/78'*& ('?%9 ('>&%%B'?/0. :&'LB')89 (&-'*9'
)"7. : "7/9*'9?' -&7&>79: '<. 7'78&'\$&"Q' - .&'79'"7&:'&% .7/*0'>9# \$9* &*7)'0 (8/>8"" :&'9. :.)" # \$%&)'9?'
 /*7&:&)'>9*?/: # &-'<+': . **/*0'/*' 6 !P"' :&')9') # ""'78"7'78&+' :&'<":&%+' ;/)/<%&'/*'78&'
 >8:9# "790:" # @'

"

,

,

$I_{+}/40\%K(9-0^{*}="3^{*}/0^{*}="50^{*}="70\%, :O789C4\%3^{*}-+/-k^{*}="423.k^{*}5k^{*}23^{*}="11.0K23k, 0\%. \%23k+2k0k^{*}="85$

"

#

*,)0,)%0&)20#1.#06)#5%&'()#

A8&'>9# \$%&U/7+'9?'78&')"# \$%&' (")'?:)7')/# \$%/?/&-'.)/ *0'&U7:">7/9*' #&789-@'DGV';W;'">&79*/7:/%&'

/*' ("7&:' (")'" - - & - '79'78&')"# \$%&' '* - ')9*/>"7&- '9:'HG' #/* .7&)@'A8&')"# \$%&' (")'78&* '>*&7:/? .0& -'

"7'=CGGU0'9:'J' #/* .7&)@'A8&')"# \$%&' (")'9<)&:;& - '79')&\$":'7&'/*'7 (9'" +&:)X' .\$\$&:'>%&":'%"+&:'

(/78')9#&'9?'78&-/)9%;&-')"# \$%&' '* - '%9 (&:';/>9.)'" +&:' (/78' . * - /)9%;&-')"# \$%&'@'A8&'

.\$\$&:'"+&:' (")'>9%%&>7&-B'"* - '%9 (&:'"+&:' (")'

I+/40%N(6789, %'L*5d3-%k. "=, \$%k. %, "0"3%I&G+3- &NBDSQTQUk ">%3*2+30+\$%k+2&G"3%0Ck; "=, \$%k
I+..*\$Q%I&+2&NBDSQTQUk ">%3*2+30+\$%k+2&G"3%0k "2I&>%230+54/%I&5*0&F&=+243%. &"3k 'HBB&V/C&
62I+..*\$Q%I&. "=, \$%. &k. %, "0"3%I&". &\$*G%0&\$ "<%0&G". &+. *\$ "3%I& "53%0&5+Q%&0*42I. &*5&G". -+2/0&
"2"\$<W%I& "2I&5*42I&3* &>*23" +2&2* &*0&Q%0<&\$+33\$%&*40k. "=, \$%. &*5&+23%0%. 3C&

***+,-./%0-12#1.#7' '),#\$+',2%0%20#!%4),#+5-2D#*,)'9C*!8#**

Y?&:'>9*?/: #/*0' (/8' 1 2 3 4 5 6 !'78"7'9.:)' # \$%&)'9?/*7&:&)7'8";&'<&&*>9# \$%&7&%+':&>9; &:&- /'*'
.\$\$&:'). \$&:*"7"*7%" +&:'?&:'?9.:':9. *-)'9?' (")8/*0B'/7' (")'78&*'\$.:/?/&-'.)/*0'2:&\$5N234@'
T":/9.)?:">7/9*)' (&:&'>9%%&>7&- "'*-' (&:&'")9""%" +, &- '9*78&'""%+7/>"%' 1 2 3 4 5 6 !'79'
-&7&: #/*&' (8/>8'?: ">7/9*)'79'.)&'9: '?. :78&:'\$.:/?/>"7/9*9?'78&'>9# \$9. *-)'9?/*7&:&)7@!' 9#&'
?: ">7/9*)'>9*7'/*&- '#9:&78"*9*&)' # \$%&)'9?/*7&:&)7' (8/>8'). 00&)7)'78"7')&>9*-'\$. :/?/>"7/9*'/)'
*&&-&-@''

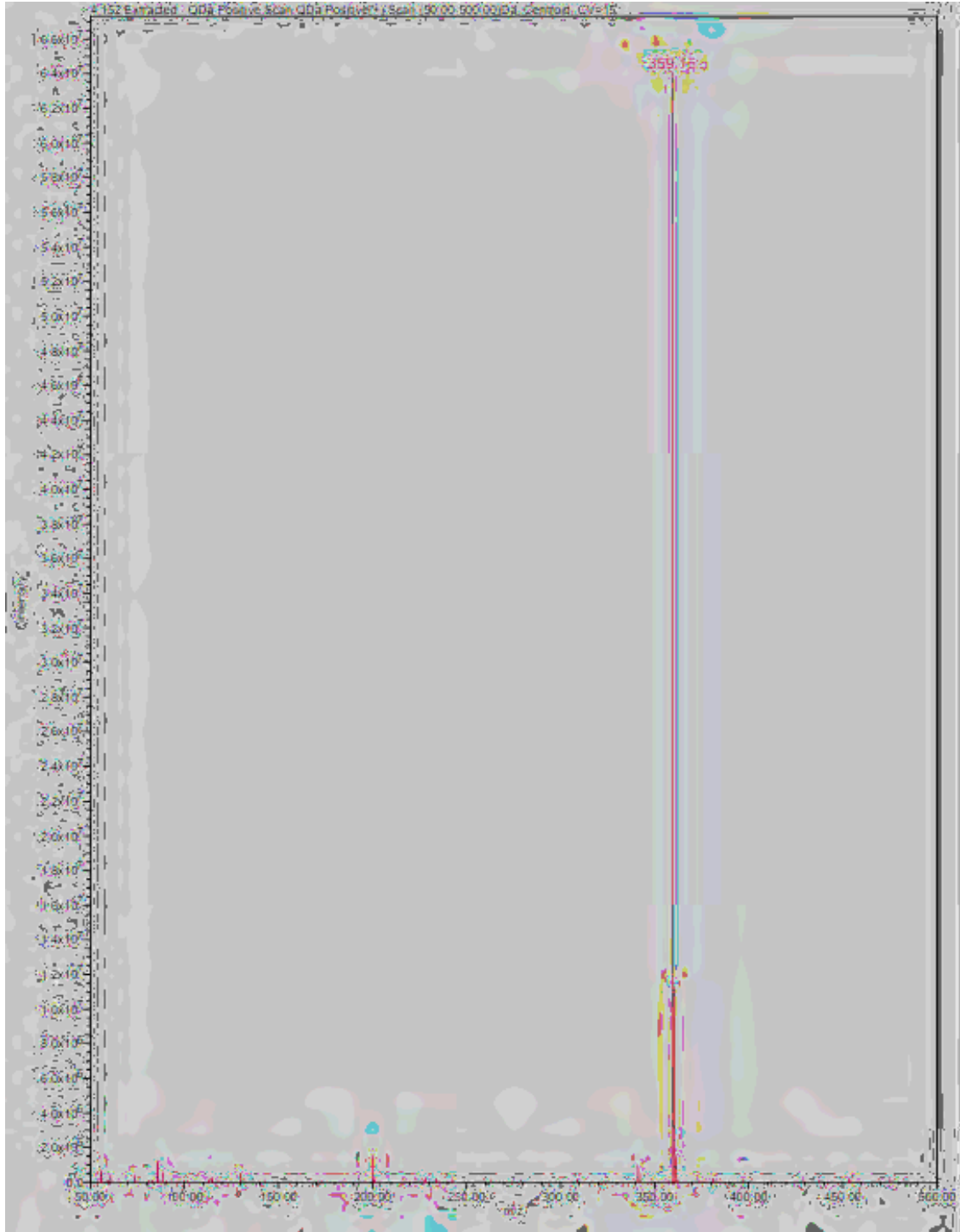
I+/40%IX(70%, :O789k>-0*="3*/0"=k*5k>*\$\$%>3%Ik4, ,%0k\$"<%0CkI\$*Gk>%\$\$k*5k, "3-d\$%2/3-dHk==k
G".d4.%ICdY"0+*4. d50">3+*2.dG%0%k>*\$\$%>3%Id3*k"2"\$<W%k*2k"2"\$<3+>"\$d6789:) ;Cdk

,

$I_{+}/40\%M(6789 > -0* = "3*/0" = k*5d50" > 3+*2k'k. - *G+2/k, \% "Lk*5k = TWZkKF[C'Kk$

"

I+/40%k



$I + 40\%k''(k)$; $k, \% > 30\%V30'' > 3\%I \& 50 * = \& 50'' > 3 + * 2 \& H \& * 5 \& > * = , * 42 I \& G + 3 - \& 3 - \% \& 0 \% 3 \% 2 3 + * 2 \& 3 + = \% \& * 5 \& JCHM' \&$
 $= + 24 3 \% \& \&$

$I + /40\%k 'H(k) ; k. , \%>30''k\%V30''>3\%I\&50^*=\&50''>3+*2\&H\&*5k>*=\ , *42I\&G+3 - \&3 - \%k0\%3\%23+*2\&3+ =\%k\&*5k.JCJFXk$
 $=+243\%Ck$

I+/40%K(6789>-0*="3*/0"=550">3+*2Kd.-*G+2/d,%L.d*5d=TWZKF[CHBC"21d=TWZKMFC'[d

"

$I + \frac{40}{100} J(k) ; k. , \% > 30 " k \% V 30 " > 3 \% I k 50 * = k 50 " > 3 + * 2 k K k * 5 k > * = , * 4 2 1 k G + 3 - k 3 - \% k 0 \% 3 \% 2 3 + * 2 k 3 + = \% k * 5 k J ' F [k$
 $= + 2 4 3 \% k$

"

I+/40%&'F(k) ;k., %>30" & %V30">3%I&50*=&50">3+*2&kK&*5&>*=& , *421&G+3 - &k3 - %&k0%3%23+*2&k3+=%&k*5&JCJ 'J&
=&+243%&

I+/40%k 'N(d6789k>-0*="3*/0"=k*5k50">3+*2kJk. -*G+2/k,% "L. k*5k=TWZKMFCH '@k=TWZkKMXCHJk"21k
=TWZJ 'KCHFk

I+/40%k 'X(k) ; k. , %>30" &%V30">3%I&50*=&50">3+*2&J& *5&>* = , *42I&G+3 - &3 - %&0%3%23+*2&3+=%&&*5&.JCJH[&
=+243%&

"

I+/40%&'M() ;&. , %>30''&%V30''>3%I&50*=&50''>3+*2&J&*5&>* = , *42I&G+3 -&3 - %&0%&3%23+*2&3+ = %&*5&JCMNK&
=+243%&

I+/40%k' [(k) ; k., %>30" &%V30">3%I&50*=&50">3+*2&J&*5&>*=& , *42I&G+3 - &3 - %&0%3%23+*2&3+=%& *5&FCBNN&
=+243%&

I+/40%kHB(k6789k>-0*="3*/0"=k*5k50">3+*2kFk.-*G+2/k,% "Lk*5k=TWZJ'KCHFk

"

$I + /40\% \text{H}'(k) ; k. , \% > 30'' \text{V}30'' > 3\% I \text{d}50^* = \text{d}50'' > 3+ *2 \text{d}F \text{d} *5 \text{d} > * = , *421 \text{d}G+3 - \text{d}3 - \% \text{d}0\%3\%23+ *2 \text{d}3+ = \% \text{d} *5 \text{d} \text{FCBJF} \text{d}$
 $= +243\% \text{d}$

,

,

,

>+0+,)# E 1,F5##

!&>9*-'\$.:/?/>"7/9*'9?'78&'?:">7/9*' (9.%-'<&'\$&:?'9:#&-' '*-' '*"%+,&-'9*' '*"%+7/>"%'
1 2 3 4 5 6 !"

Y%%')"# \$%&)' (/%%'78&*<&').<L&>7&- '79'""9:&# &*7/9*&-'\$:9>&))'79'\$.:/?+'9.:')"# \$%&)'9?'
/*7&:&)7@''

1 \$\$&:' '*-'39 (&:'%"&+&:' (/%%'78&*<&' '*"%+,&- ' (/78'78&'%9*0' # &789-'78"7' (&'8";&'79'
>9*?/: # '>9# \$%&7&':&>9;&:+ '9?'9.:')"# \$%&)'9?'/*7&:&)7@''

A (9')7&\$'\$\$.:/?/&-'?:">7/9*)' (/%%'?' '*"%+,&' '*"%+,&- '9*' 1 2 3 4 5 6 !'.)/'0%'9*0' # &789-'79'
8";&'<&77&:')&\$":'7/9*'9?'78&'\$&"Q)' '*-' '\$.:/7+'>9*?/: # "7/9*@'

#

**G10)H#A8&'%9*0' # &789-' 1 2 3 4 5 6 !'0/;&)'<&77&:':&)'9%.7/9*'9?'\$&"Q)'<.7'?'9:'\$:&%/ #'/*":+)'7&\$)'9?'
\$.:/?/>"7/9*'79)\$&&-'. '\$78&' '*"%+))B' (&'&:&%'9\$&-')89:7' # &789-'9*' '*"%+7/>"%' 1 2 3 4 5 6 !'E/*"%'
" '*"%+))'9:'78&'\$\$.:/?/&-')"# \$%&)'9?'/*7&:&)7' (/%%'<&' '*"%+,&- '.)/'0%'9*0' # &789-@''**

,