

BIOM9333

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7ci fgY'8YHJ]`g

I b]hg'cZ7fYX]h*`

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X g f g H\]g'W]` W 'hY' U g'cZ c ' c c]g' Y c Y

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E fgVW fe i Za bWad_ baadk [fZW i VW] k bdaYdWee fSe] e SdWdWUa__ W VW fa V[eUgee bdaYdWee i [fZ fZW5 agdeW5a` hW adVgd[Y fZWfWd_ ž

FZWX S^YdSVWXd fZ[e UagdeWi [^ ad_ S^k TWTSeW a` fZWeg_ aXfZWeUadWe Xa_ W SUZ aXfZW SeeWee_ W f fSe] ež FZW5 agdeW5a` hW addWeWdWe fZWdYZf fa SV'gef fZWX S^eUadWe Tk eUS↑ Y [XSYdWWW Tk fZW: WSV aXE UZaa ž

5ggYgga Ybhia Uf_g'UbX'ZYXVUW_k]''VY'Uj U]UV'Y'cb'A ccX'Y'Ug'gccb'Ug'hYm\Uj Y'VYYb'a Uf_YXžk \JWX k]''i gi U'miVY'k]h]b'&k YY_g'cZgi Va]gg]cb"

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7\YW_dc]bhHUg_g]f] k]''Ybgi fY'mci 'UFY'_YYd]b['i d'k]h'Wcbh'bhVmUbgk Yf]b['U'gYhcZei Yg]cbg'YUWX k YY_"

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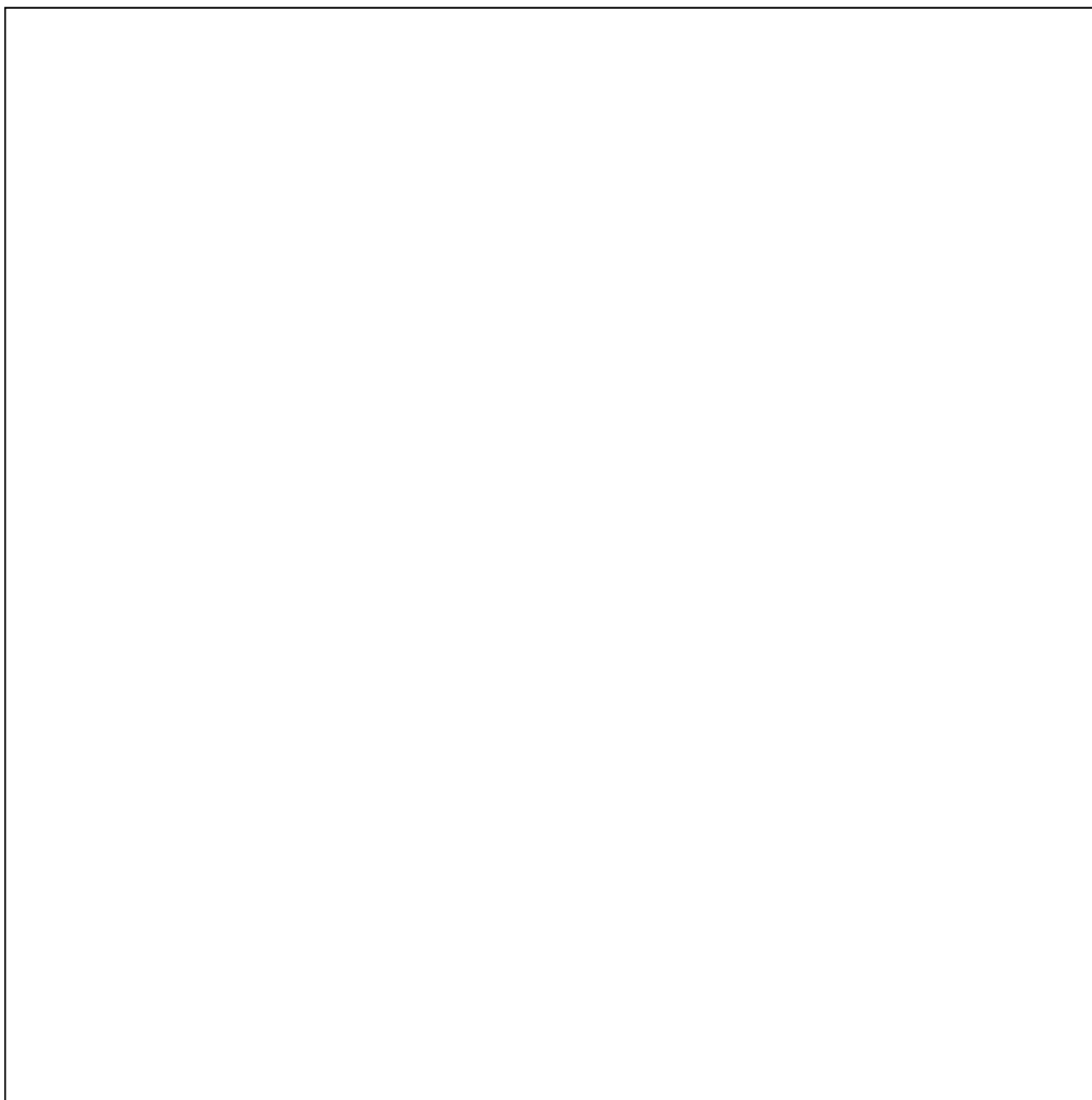
8i Y'XUHY. fYZf'hc'Wci fgY'gVXYXi 'Y

H\Y'a U'ef'dfc'YWhk]'gYY'mci 'XYg][b'U'fY[YbYfUHj Y'a YX]W]bY'dfcXi Whi h']g]b['U'V]cUW]j Y''H\]g'k]''VY
UggYggYX'j]b'a i 'hd'Y'dUfhg.'A]YghcbYg'fl ž% 'YUW]ž'DfcXi Whd]hW]f) i žHYW]b]W]fYdcfhf) i ž'UbX
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UbX'VfcUXYb'i bXYfghUbX]b['cZhY'žY'X'cZfY[YbYfUHj Y'a YX]W]bY''



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Gh XYbhZYXVUW`Ug`Y`dYX`hc`g`UdY`UbX`XYj Y`cd`h]g`Wci fgYž]bWi X]b[`ZYXVUW`cVU]bYX`Zca`cb!`]bY`Yj U`i Uh]cbg`Ug`dUfhcZI B GK `g`a m9I dYf]YbW`dfcWgg"

H\Y`Wci fgY`i bXYfk YbhU`a U`cf`fYj]g]cb`]b`&\$&\$`k]h`WU]b[Yg`]bWi X]b[`fYcfXYf]b[`cZ`hY`WcbYbh XY`]j YfYXžfYj]g]cb`hc`hY`Wci fgY`WcbYbhUbX`]bWi g]cb`cZa U`cf`dfc`YWhgYgg]cbg`hc`Ugg]ghk]h`hY`h]a Y`m UbX`ZcW`gYX`XYj Y`cda YbhicZ`hY`a U`cf`dfc`YW`i: cf`hY`Z]fgh]a Yž`U`Wci fgY`WcbYbh]g`XYg][bYX`Zc`f`cb`]bY UWW`gg`k]h`]bgf`UbhZYXVUW`]bW`dfc`fU`hX`]bhc`U`Yggcbg`UbX`UW]j]h]Yg": i fhYf`XYj Y`cda Ybhg`]b`&\$&`\Uj Y`]bWi XYX`hY`]bWi g]cb`cZ`UbXg]cb`UW]j]h]Yg`]b`gca Y`k cf`g`cdg`UbX`fYj]g]cb`cZ`hY`Wci fgY`WcbYbh UbX`UggYgga Ybhg"

DfYj]ci g`gh XYbhg`]b`hY`WUgg`dfc]]XYX`ZYXVUW`]bWi X]b[`HWk [fWdMef] Y UagdeWS` V i W^adYS` [eW""ž`FZWSUf]h[f]Wé i WdWW YSY[YI W`akST`W dMcg[dW Ud[f[US^fZ[] [Y S` V i WdWi W^ [fWdSfW [fa fZW UagdeW"

Gi Va]gg]cb'cZ5ggYgga YbhiHUg_g

@UVcfUhcfmfYdcfng'UbX'a U'cf'Ugg][ba Ybht'k]''fYei]fY'U' [Bcb'D'U\[\]Uflga '8YWUfUhc'7cj Yf'G\YYH'](#)

5gg][ba Ybht'g\ci 'X'VY'gi Va]hYX'cb'hja Y''5'XU]mdYbU'hmcZ) i 'cZhY'a Uf_g'Uj U]UV'Y'Zcf'hUh
Ugg][ba Ybhk]''Udd'mZcf'k cf_'fYW'j YX'UZf'hY'Xi Y'XU'h''5bmiUgg][ba Ybhia cfY'h'Ub') 'XUmg''UH'k]''bch
VY'UWV'dh'X''H\Y'cb'mYI Ya dh]cb'k]''VY'k \Yb'df]cf'dYfa]gg]cb'Zcf''UH'gi Va]gg]cb'\Ug'VYYb'[fUbh'X'Vm
hY'7ci fgY'W'cfX]bUhc'f''9I hYbg]cbg'k]''VY'[fUbh'X'cb'mcb'a YX]W'cf'W'a dUgg]cbUH'[fci bXg'i bXYf
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5 WUXYa]W< cbYgmiUbX`D`U[]Uf]ga

D@5; ≠F ≠GA

6Yk UFY`5b`Ugg][ba YbhUUh]bWl XYg`d`U[]Uf]gYX`a UHf]U`k]`fYW]j Y`U`\$i : U]žUbX`gh XYbhtg`k \c d`U[]Uf]gY`a UmZ]`hY`Wci fgY`Gh XYbhtg`k \c d`U[]Uf]gY`k]`Uj Y`hY]f`bUa Yg`YbHYfYX`cb`U`d`U[]Uf]ga fY[]ghf`UbX`k]`VY`]UV`Y`hc`X]gW]d`]bUfmiUW]cbž]bWl X]b[`Yl Wl g]cb`Zca `Ybfc`a Ybh`
#]g`Yl dYWYX`hUUhU`gh XYbhtg`a i ghUUhU`h]a Yg`gi Va]hY]f`ck`b`k`cf`_`Zcf`UggYgga Ybh`Gi Va]h]b[`hY`k`cf`_`cf`]XYUg`cZgca YcbY`Y`gY`k]h]ci hWYUfmiUW_bck`YX[]b[`hY`gci fW`cZVcffck`YX`a UHf]U`cf`]XYUg`]g d`U[]Uf]ga "

5`UggYgga Ybhtg`k \]Wl`mci `UbX`]b`a i gh`Uj Y`U`[B`cb`D`U\[\]Uf\]ga`8YWUfU\]cb`7cj`Yf`G`YYH`H\\]g`\]g`Zcf`Vch`\]bX\]j`\]Xi`U`UbX`\[fci`d`k`cf`_`5HUVW`\]h\]c`mci`f`Ugg\]\[ba YbhVYZcfY`gi Va \]h\]b\[`\]h\]c`hY`7`ci`fgY`7`ccfX\]bUhc`f`cf`UhhY`GVXcc`C`Z\]W"](#)

D`U[]Uf]ga `]g`hY`i`gY`cZUbchYf`dYfgcb`g`k`cf`_`cf`]XYUg`Ug`]ZhYmik`YfY`mci`f`ck`b`K` \Yb`]h]g`bYW]ggUfmicf`XYg]fUV`Y`hc`i`gY`chYf`dYcd`Y`g`a`UHf]U`mci`g`ci`X`UXYeI`UH`mUW_bck`YX[Y`k` \cgY`k`cfXg`cf`]XYUg`hYm`UfY`UbX`k` \YfY`mci`Zci`bX`hY`a`f`]j`]b[`hY`Wca`d`YH`fYZYfYbW`XYH]`gž]bWl X]b[`dU[Y`bi`a`VYffg]H`Y`@YUfb]b[`7`YbHY`dfcj`]XYg`Z`fH`Yf`]bZcfa`U]cb`cb`k` \UhWcbgh]h`H`g`D`U[]Uf]ga `Uh` \Hdg`#]gh`XYbhi`bgk`"YXi`"Ui`#]U[]Uf]ga

5WUXYa]WbZcfa Uh]cb

7CI FG9'9J5@! 5H€B'5B8'89J9@CDA 9BH

Gh XYbhZYXVUW_\Ug\YdYX'hc'g\UdY'UbX'XYj Y'cd'h\]g'Wci fgYz]bWi X]b['ZYXVUW_cVHU]bYX'Zca'cb!
]bY'Yj U'i Uh]cbg'Ug'dUfhcZI BGK 'g'Ug'dUfhcZI BGK 'g'a m9I dYf]YbW'dfcWgg"Mc'i 'UfY'\][\`m
YbWci fU[YX'hc'Wca d'YH'gi W\ 'Ub'cb!]bY'Yj U'i Uh]cb'hck UfX'hY'YbX'cZHYfa "': YXVUW_UbX'gi [[Ygh]cbg
dfcj]YX'k]"VY'ja dcfhUbh]b]ja dfcj]b['hY'Wci fgY'Zf'Z hi fY'gh XYbtg"

85H9G'HC' BCH9

FYZf'hc'A m BGK 'Zcf'a dcfhUbh8UH'gžUj U]UV'Y'Uh

? Ybg]b[hcb`Wla di g`lg`cWJHYX"

5ddYbX]l . '9b[]bYYfg'5i ghfU`U'f95Ł'DfcZYgg]cbU`'9b[]bYYf'7ca dYhYbWm
GHUbXUfX

Dfc[fUa 'hYbXYX'@YUfb]b['Ci hWta Yg	
? bck `YX[Y'UbX'g_]`VUgY	
D9%"%7 ca dfY\Ybg]j YžhYcfmVUgYX'i bXYfghUbX]b['cZhY'i bXYfd]bb]b['bUh fU`UbX d\mg]WU`gWYbWg'UbX'hY'Yb[]bYYf]b['Z bXUa YbH'g'Udd']WUV'Y'hc'hY'Yb[]bYYf]b['X]gWd`]bY	
D9%"&'7 cbWdh U`i bXYfghUbX]b['cZhY'a UhYa Uh]Wgžbi a Yf]WU`UbU'mg]gžghUhgh]WgžUbX Wta di h'f'UbX']bZcfa Uh]cb'gWYbWg'k \]W' i bXYfd]b'hY'Yb[]bYYf]b['X]gWd`]bY	
D9%" " 'h!XYdh'i bXYfghUbX]b['cZgdYWU]ghVcX]Yg'cZ_bck `YX[Y'k]h]b'hY'Yb[]bYYf]b[X]gWd`]bY	
D9%"('8]gWfba YbhcZ_bck `YX[Y'XYj Y`cda YbhUbX'fYgYUfW'X]fYW]cbg'k]h]b'hY Yb[]bYYf]b['X]gWd`]bY	
D9%") ? bck `YX[Y'cZYb[]bYYf]b['XYg][b'dfUW]W'UbX'WcbhYi h U`ZUWc'fg]a dUW]b['hY Yb[]bYYf]b['X]gWd`]bY	
D9%"* 'i bXYfghUbX]b['cZhY'gWc'dYždf]bWd`Ygžbcfa gžUWc'i bhUV]']h]Yg'UbX'Vci bXg'cZ gi gh]bUV'Y'Yb[]bYYf]b['dfUW]W']b'hY'gdYW]ZWX]gWd`]bY	
9b[]bYYf]b['Udd']WU]cb'UV']]m	
D9%"%5dd`]WU]cb'cZYghUV]g\YX'Yb[]bYYf]b['a Yh'cXg'hc'Wta d'Yl'Yb[]bYYf]b['dfcV'Ya gc']]b[
D9%"&'&'i YbhUdd']WU]cb'cZYb[]bYYf]b['h'W]b]ei Ygžhc'c'g'UbX'fYgci fW'g	
D9%" " '5dd`]WU]cb'cZgmg]Ya Uh]WYb[]bYYf]b['gmb'hYg]g'UbX'XYg][b'dfcW'ggYg	
D9%"('5dd`]WU]cb'cZgmg]Ya Uh]WUddfcUW]Yg'hc'hY'WcbXi W]UbX'a UbU[Ya YbhcZYb[]bYYf]b[dfc'YWg	
DfcZYgg]cbU`UbX'dYfgcbU`Uhf]Vi hYg	
D9' "%9h]WU`WcbXi W]UbX'dfcZYgg]cbU`UWc'i bhUV']]m	
D9' "&'9ZYW]j Y'cfU`UbX'k f]hYb'Wta a i b]WU]cb']b'dfcZYgg]cbU`UbX`UmXca U]bg	
D9' " '7fYUh]j Yž]bbcj Uh]j Y'UbX'dfc!UW]j Y'XYa YUbcif	
D9' "('DfcZYgg]cbU`i gY'UbX'a UbU[Ya YbhcZ]bZcfa Uh]cb	
D9' ") 'C'fXYfma UbU[Ya YbhcZgY'ž'UbX'dfcZYgg]cbU`WcbXi W]	
D9' "*" '9ZYW]j Y'hYUa 'a Ya VYfg\]d'UbX'hYUa `YUXYfg\]d	