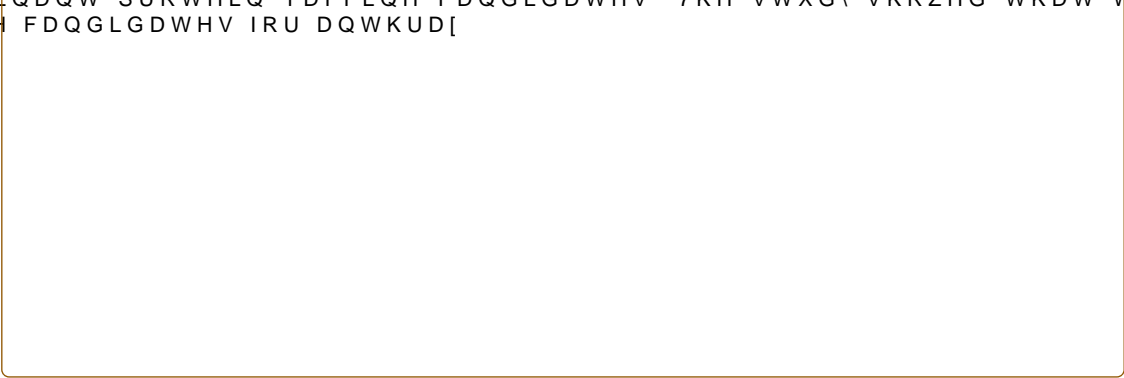




%FWFMPQNFOU PG 3FDPNCJOBOW %PN#BBDJTMFG  
BOUISBDET&WBMVBUJPO PG UIFJS \*NNVOF 3FT  
6TF BT 7BDDJOF \$BOEJEBUFT GPS "OUISBY

\$QVKXO 9DUVKQH\ DQG \*RHO \$.

FRPSRVHG RI SRO\ ' JOXWDPLF DFLG DQG D VHFUHWHG WULSDUWLWH EDFWHULDO WR[LQ FRPSRVHG RI  
OHWKDO IDFWRU /) DQG HGHPD IDFWRU () 3\$ LV WKH SLYRWDO SURWHLQ RI WKH DQWKUD[ WR[LQ FRP  
WR 3\$ LV FHQWUDO WR SRO\ DFWKROD BULWLV VWXG\ RYHUODSSLQJ SRUWLRQV RI IRXU GLIIHUHQW  
ZHUH FORQHG DQG H[SUHVHG 7KH UHFRPELQDQW SURWHLQV ZHUH SXULILHG DQG XVHG IR  
UHVXOWV VKRZHG WKDW DOO WKH GRPDLQV HOLFLWHG KLJK DQWLERG\ WLWUHV LQ YDFFL  
VKRZHG WKH KLJKHVW LPPXQH UHVSQVH DJDLQVW 3\$ \$PRQJ WKH ,J\* VXEW\SHV ,J\* UHVS  
WKH LPPXQL]HG JURXS V IROORZHG E\ ,J\* 7KLV LQGLFDWHG WKH LQGXFWLRQ RI 7K W\SH L  
UHFRPELQDQW SURWHLQ YDFFLQH FDQGLGDWHV 7KH VWXG\ VKRZHG WKDW WKH LQGLYLGX  
YDFFLQH FDQGLGDWHV IRU DQWKUD[



.HIZRUC\$QWKUDFLQOXV, DFWKROD BULWLV SURWHLFWLYH  
DQWLJHQ 9DFFLQH

,QWURGXFWRQ

\$QWKUD[ SULPDULO\ D GLVHVV RI KHUELYRUHV DQG GRPHVWLF OLYHVWRFN L  
FDXVHG E\ WKH \*UDP SRVLWLYH% DVS BDX WRUPLQJ EDFWHULXP  
DQWKUDFLXPDQ WKHUH DUH WKUHH PRGHV RI LWV LQIHFWRQ FXWDQHRXV  
JDVVURLQWHVWLQ BOYDQGHQK BODWLBQDQ LV GXH WR  
WKH FDSVXOH DQG D WULSDUWLWH DFWKROD BULWLV SURGXFHG E\ WKH  
SODVPLGV S;2 DQG S;2 FDUU\ WKH JHQHV HQFRGLQJ WR[LQ DQG FDSVXOH  
UHVSHFWLYHO\ \$QWKUD[ WR[LQ D WULSDUWLWH WR[LQ LV FRPSULVHG RI SURWH  
DQWLJHQ 3,%ÿ' VSHFL}F UROH LQ

GLYLGXDO GRPDLQ FDQ H[LWV VHSUDUDWHO\ IURP WKH  
DLQLQJ LWV VWUXFWXUDO DQG IXQFWLRQDO LQWHJULW\ > @  
PLQR DFLGV DD FRQWDLQV WKH IXULQ  
KLFK LV FOHDYHG WR UHOHDVH WKH 1 WHUPLQDO  
SURWHLQ 3\$ LV KHSWDPHUL]HG  
JDFWLRQV RI WKH FHOV VXUIDFH > @ À0> @

( FRISURWHLQV Z  
SXUL]MS KRPRJHQHLW\ DQG XVHG IRU LP  
LPPXQH UHVSQVHSHGLJFWUDQ GRWKHLU LV  
LQGLYLGXDO GRPDLQV DQG DJDLQVW ZKRO

0DWHULDOV DQG 0HWKRGV

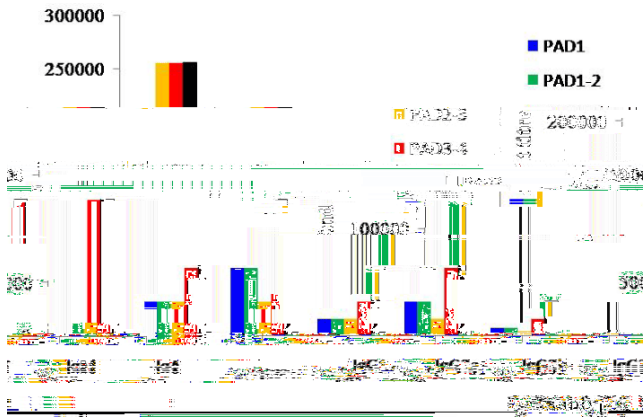
&ORQLQJ H[SpurifvtdnRQI DQG GRPDLQ SURWHLQV

H '1\$ HQFRGLvGJGRV LQDPZIUHJ&5 XVLQJ  
WK% DQWKUDFLV

'& +RZHYHU DQG 3\$' SHUIRUPHG EHVW DW LQGXFWRQ SHULRG RI K  
ZLWK WKH DGGLWLRQ&RI P0 ,37\* DW

Purification RI UHFRPELQDQW 3\$ GRPDLQ SURWHLQV

\$OO WKH UHFRPELQDQW SURWHLQV KDYLQJ +LVWLGLQH IXVLRQ WDJ ZHUH  
SXULYHG 17\$ FKURPDWRJUDSKI XQGHU GHQDWXUHG FRQGLWLRQ \$OO  
WKH SURWHLQV ZHUH IRXQG WR EH SUHVHQW LQ LQVROXEOR IUDFWLRQ RI FHOOC  
DV UHYHDOHG E\ 6'6 3\$\*( 3URWHLQV ZHUH HOXWHG XVLQJ GHQDWXULQJ  
HOXWLRQ



/HSSOD 6+ \$QWKUD[ WR[LQ HGHPD IDFWRU D EDFWHULDO DGHQ\ODWH  
F\FODVH WKDW LQFUHDVHV F\FOLF \$03 FRQFHQWUDWLRQV RI HXNDU\RWLF FHOOV 3URF  
1DWO \$FDG 6FL 86\$  
9LWDOH \* 3HOOL]]DUL 5 5HFFKL & 1DSROLWDQL \* 0RFN 0 HW DO  
\$QWKUD[ OHWKDO IDFWRU FOHDYHV WKH 1 WHUPLQXV RI 0\$3..6 DQG LQGXFHV  
W\URVLQH WKUHRQLQH SKRVSKRU\ODWLRQ RI 0\$3.6 LQ FXOWXUHG PDFURSKDJHV  
- \$SSO 0LFURELRO  
-DHQLFNH 5 6WDELOLW\ DQG IROGLQJ RI GRPDLQ SURWHLQV 3URJ %LRSK\V  
ORO %LRO  
0F%ULGH %: 0RJJ \$ 7HOIHU -/ /HYHU 06 0LOOHU - HW DO  
3URWHFWLQ D UHFRPELQDQW SURWHFWLYH DQWLJHQ DJDLQVW %DFLOOXV  
DQWKUDFLV FKDOOHQJH DQG DVVHVVPHQW RI LPPXQRORJLFDQ PDUNHUV 9DFFLQH  
  
\*XSWD 3. &KDQGUD + \*DXU 5 .XUXSDWL 5. &KRZGKXU\ 6 HW DO  
&RQIRUPDWEWDLQDQW\$QWKUD[ SURWHFWLYH DQWLJHQ D SRVVLEOH UROH  
RI FDOFLXP LQ WKH IROGLQJ SDWKZD\ RI WKH SURWHLQ )(%6 /HWW  
/LWWOH 6) 1RYDN -0 /RZH -5 /HSSOD 6+ 6LQJK < HW DO