



5HVHDFK \$UWLFOH 2SHQ \$F

%FWFMPQNF OUG PG 3FDPNCJOB OUG %PNBBDJTMFG
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 SLRWDO SURWHLQ RI WKH DQWKUD[WR[LQ FRP
WR 3\$ LV FHQWUDO WR SRVDFWKRQD BUKLQ VVWXG\ RYHUODSSLQJ SRUWLRQV RI IRXU GLIIHUHQW
ZHUH FORQHG DQG H[SUHVVHG 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 VVWXG\ VKRZHG WKDW WKH LQGLYLGX
YDFFLQH FDQGLGDWHV IRU DQWKUD[



.HIZRUC\$QWKUDFLQOXV,DEWGHDFWLSRQVH 3URWHFWLYH
DQWLJHQ 9DFFLQH

,QWURGXFWRQ

\$QWKUD[SULPDULO\ D GLVHDVH RI KHUELYRUHV DQG GRPHVWLF OLYHVWRFN L
FDXVHG E\ WKH *UDP SRVLWLYH%DFSDXWRUPLQJ EDFWHULXP
DQWKUDFLQXPDQ WKHUH DUH WKUHH PRGHV RI LVW LQHFWRQ FXWDQHRXV
JDVVURLQWHVWLQBOYDQGHQKFDORWLRQDULXP LV GXH WR
WKH FDSVXOH DQG D WULSDUWLWH@DFLQ 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[LVW VHSUDUDWHO\ IURP WKH
DLQLQJ LVW 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 FHOO VXUIDFH > @ À0> @

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

0DWHULDOV DQG 0HWKRGV

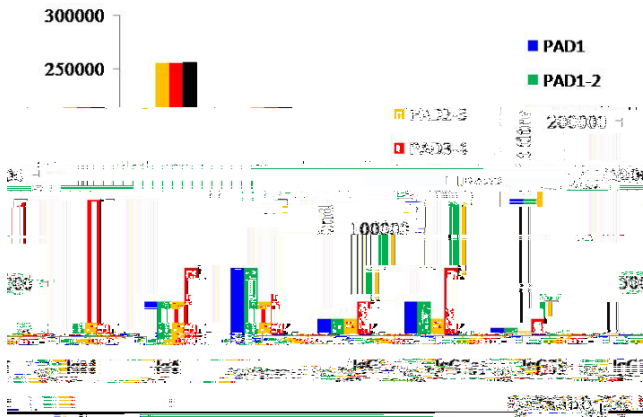
&ORQLQJ H[SpurifvtdnRQI DQG GRPDLQ SURWHLQV

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

'& +RZHYHU DQG 3\$' SHUIRUPHG EHVW DW LQGFWLRQ 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 LQVROXEOH 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 LPPXQRORJLFDO 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