

0DWHULDO DQG 0HWKRGV

3DWLHQWV

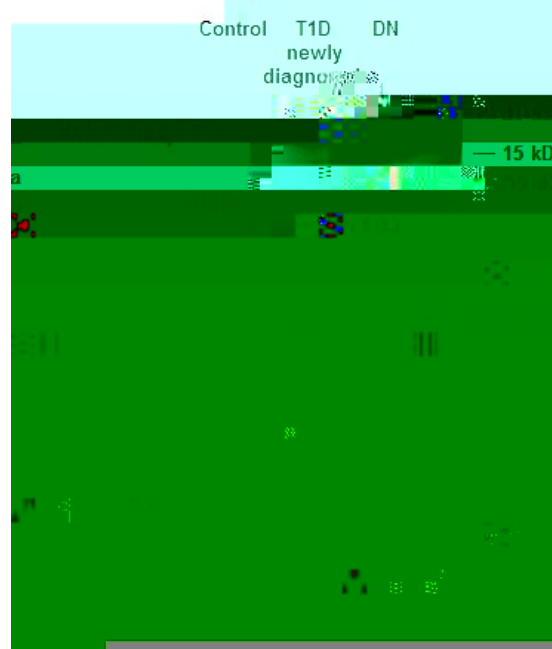
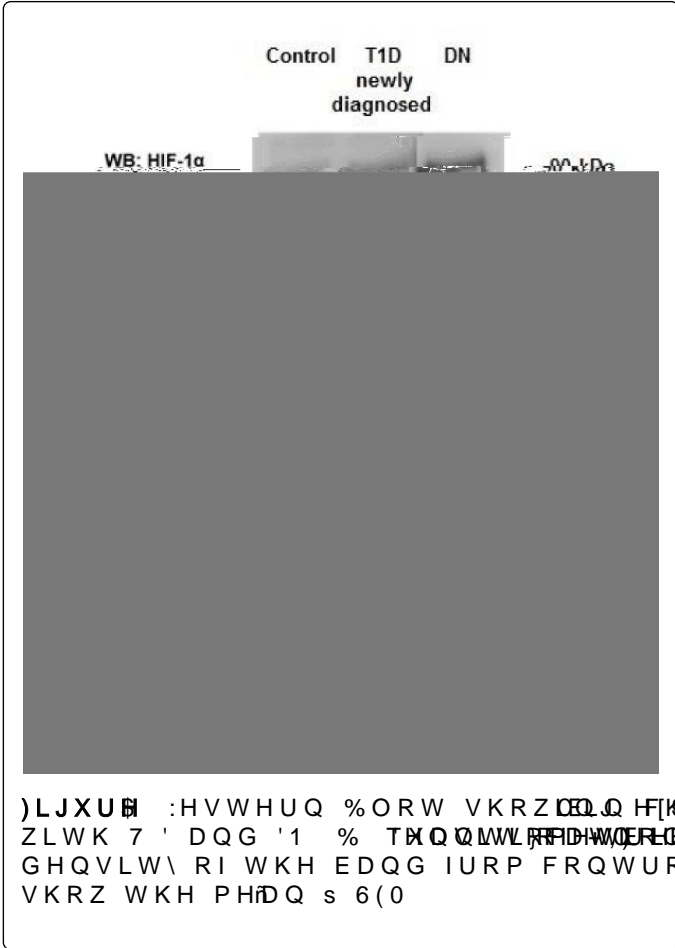
\$ VXUYH\ RI SDWLHQWVd FKLOGUHQ ZLWK 7 'V DJHG WR \HDUV ZKR
ZHUH KRVSLWDOLJHG LQ WKH (QGRFULQRORJ\ XQLW RQ &KLOGUHQdV &OLQLFDO
+RVSLWDO .\LY LQ ZDV GRQH &RPSOH[H[DPLQDWLRQ
LQFOXGLQJ FRQYHQWLRQDO PHWKRGV LQVSHFWLRQ PRQLWRULQJ EORRG
SUHVXUH EORRG WHVWV VWXG\ RI XULQDU\ VHGLPHQW UHQDO XOWUDVRXQG I
ZDV GRQH WR DOO SDWLHQWV 2WKHU WKDQ FRQYHQWLRQDO PHWKRGV L H VSHF
DQDO\VLV RI WKH IRUPV RI KHPRJORELQ SODVPD OHYHOV RI +,) DOID
FDVSDVH 9LWDPLQH 'FRZDUGRQHURXS LQFOXGHG
KHDOWK\ FKLOGUHQ 6WXG\ SHUIRUPHG EDVHG RQ HWKLFDO VWDQGDUGV 1DWLRQ
8NUDLQLDQ FRPPLWWHH RQ KXPDQ H[SHULPHQWDWLRQ 1DWLRQDO 2 2
%RJRPROHWV PHGLFDO 8QLYHUVLW\ DQG RQ WKH +HOVLQNL 'HFODUDWLRQ

6SHFWURPHWU\

H DyQLW\ KHPRJORELQ WR R[\JHQ ZDV GHWHUPLQHG XVLQJ
VSHFWURSKRWRPHWULF PHWRG +HPRO\VLV RI UHG EORRG FHOOV ZDV
SHUIRUPHG E\ IUHH]LQJ PHOWLQJ RI EORRG VDPSONV (OHFWURQLF
KHPRJORELQ VSHFWUD ZHUH UHFRUGHG XVLQJ D VSHFWURSKRWRPHWU 7
89 9,6 3* ,QVWUXPHQWV /LPLWHG 8. 4XDQWLWDWLYH HYDOXDWLRQ RI
VSHFWUD ZDV SHUIRUPHG LQ WKH \$

3DUDPHWU 7 ' ILUVWO\ GLDJQRVHG &RQWURO

(QGRJHQRXV OHYHOV RI WKH 9LWDPLQ SDWLHQWV LWK DWR QXFKS HWKEXOW LQSDUO VWLW SDWLHQWV KDYH EHHQ UHFUXLWHG WRHWKHU SVRUGW DQW LDUU OMKHYI 6 6 SWHP 6 H U)DEUXDU\



)LJXUH :HVWHUQ %ORW VKRZLQJ H[SUH FKLOGUHQ ZLWK 7 ' DQG 'TXDQW\HODWLRQ FDVSDVHG HQVLW\ RI WKH EDQG IURP FRQ

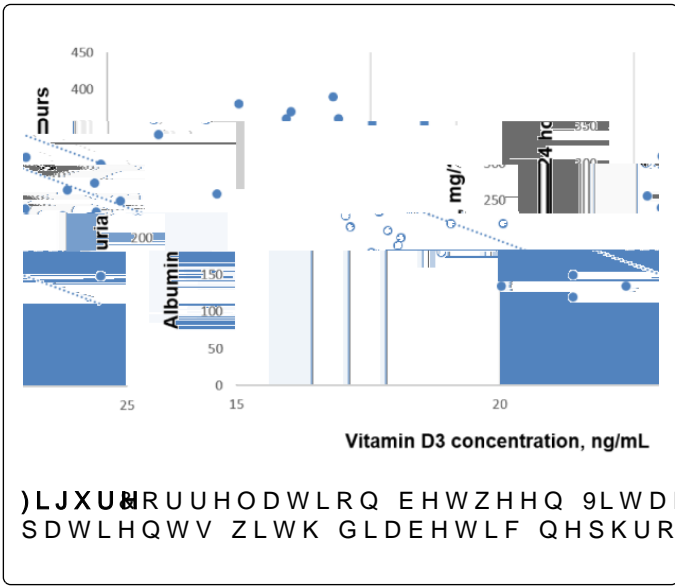
)LJXUH :HVWHUQ %ORW VKRZLQJ H[SUHFKLOGUHQ ZLWK 7 ' DQG 'TXDQW\HODWLRQ FDVSDVHG HQVLW\ RI WKH EDQG IURP FRQWURO JURXS ZDV VHW WR +LVWRJUDPV VKRZ WKH PHDQ s 6(0

:H VKRZ WKDW WKH PRVW SURPLQDW 9LWDPLQ ' GHWHFWHG LQ WKH JURXS RI SDWLHQWV ZLWK GLDEHWF QHSKURSDWK\ ,Q FRQW JURXS 9LWDPLQ ' ZDV GHWHFWHG DW OHYO s QJ P/ LQ SDWLHQWV ZLWK 7 ' s QJ P/ LQ SDWLHQWV ZLWK GLDEHWF QHSKURSDWK\ s DV FRPSDUHG WR FRQWURO JURXS)LJXUH \$ \$QDO\VLV RI WKH 9LWDPLQ ' OHYHOV DQG GXUDWLRQ RI LQ WKH GLVHDVH IRXQG QHJDWLYH FRUUDWLRQ EHWZHHQ WKHP 5 ñ)LJXUH %

'LVFXVVLQRQ

,W KDV EHHQ ZLGHO\ DFFHSWHG DQG KLVWRORJLFDO VWXGLHV KDYH FRQ}UPVHG WKH GHWHULRUDWLRQ RI UHQDO IXQFWLRQ LQ FKURQLF NLGQH\ GLVHDVH &.' EHWWHU FRUUDOHV ZLWK WXEXODU DQG LQWHUVWLWLD FKDQ WKDQ ZLWK JORPHUXODU FKDQJHV 7XEXODU G\IXQFWLRQ KDV EHHQ UHSRUWHG LQ WKH DEVHQFH RI PLFURDOEXPLQXULD LQ SDWLHQWV ZLWK GLDEHWHV PHOOLW (DUO\ WXEXODU LQMXU\ KDV EHHQ UHSRUWHG LQ SDWLHQWV ZLWK GLDEHWHV PHOOLWXV ZKR VH JORPHUXODU IXQFWLRQ LV LQWDFW > @

&KURQLF K\SR[LQ RI WKH WXEXORLQWHUVWLWLVXP KDV EHHQ UHFRJQL]HG DV D PHFKDQLVP RI SURJUHVVLRQ WKDW HV FRPPRQ WR PDQ\ UHQDO GLVHDVHV K\SR[LQ PLOLHX LQ HDUO\ VWDJH GLDEHWF QHSKURSDWK\ LV DJJUDYDWHG E\ PDQLIHVWDWLRQV RI FKURQLF K\SHUJO\FHPLD DEQRUPDOLWLHV RI UHG EORRG FHOOV R[LGDWLYH VWUHV V\PSDWKHWLF GHQHUYDWLRQ RI WKH NLGQH\ GXH DXWRQRPLF QHXURSDWK\ DQG GLDEHWHV PHOOLWXV LQGXFHG WXEXODU



)LJXU&RUUHODWLRQ EHWZHHQ 9LWDPLOQ ' OHYHOV DQG DOEXPLQXULD LQ SDWLHQWV ZLWK GLDEHWLF QHSKURSDWK\

+HPRJORELQ EHORQJV WR WKH IDPLO\ RI SURWHLQV FRQWDLQLQJ SURVWKHWLF JURXS DQG SURWRSRUSK\ULQ ; KHPH ,Q DGGLWLRQ WR WUDQVSRUW R[\JHQ KDPRKORELQ SHUIRUPV D QXPEHU RI LPSRUWDQW IXQFWLRQV ELQGLQJ RI QLWULF R[LGH DQG VXOSKLGHV LQWHUDFWLRQ ZLWK UHDFWLYH R[\JHQ DQG QLWURJHQ DQG RWKHU VHQRU\ IXQFWLRQV \$V D UHVXOW RI K\SHUJO\FHPLD LQ GLDEHWLV WKHUH LV DQ LQFUHDVH R[\KHPRJORELQ IRUPDWLRQ DQG LWV WUDQVIRUPHG IRUPV 'DPDJH WR WKH SRUSK\ULQ ULQJ IROORZHG E\ GHJUDGDWLRQ RI KHPH DSSHUV +HPH GHJUDGDWLRQ LV FDUULHG RXW LQ WZR VWDJHV DQG LQFOXGHV KHPH LURQ R[LGDWLRQ DQG QLWUDWLRQ RI W\URVLQH

02D

MXCGHA Λ 25EKB \$*BKQ Q 7 6KLQ 0 \$Q HQ\|PLF UHGXFWRQ V\|VWHP IRU
ИГОHA E3KHWPIRJO PPHWRJORELQ DQG PHWKHPRJORELQ DQG LWV DSSOLFDWLRQ WR IXQFWLRQDO
VWXGLHV RI RI\JHQ FDUULHUV %LRFKLP %LRSKIV \$FWD
DZHTNANZNNZNY DGE QWYRKO @ RFG10FGK AFMKW
b.KB 3DUN @.bQDO (+ .LP ,- 0D 6. &KRL & HW DO 5HQRSURWHFWLYH
PHWRJORELQ DQG PHWKHPRJORELQ DQG LWV DSSOLFDWLRQ WR IXQFWLRQDO PHFKDQLVPV RI
3DUN -: %DH (+ .LP ,- 0D 6. &KRL & HW DO 3DULFDOWLRO
DWWHQXDWHV F\FORVSRULQH LQGXFHG NLGQH\ LQMXU\ LQ UDWV .LGQH\ ,QW

3K\VLRO 5HQDO 3K\VLRO)
3DUN -: %DH (+ .LP ,- 0D 6. &KRL & HW DO 3DULFDOWLRO
DWWHQXDWHV F\FORVSRULQH LQGXFHG NLGQH\ LQMXU\ LQ UDWV .LGQH\ ,QW