





ORZ RUOXRQWUDDILQRVH IDPLO\ RI ROLJRVDFFKDULGHV 7KH  
DVVLVWHG VHGHSFORVPOHDOGRI QHZ VR\EHDQ RU UHODWHG F  
IHHG SURGXFWLRQ

, DOVR KDG WKH RSSRUWXQLW\ WR OHDUQ IURP 'U %LO\HX  
FURVVLQJ EQRIKWURDQWQGXFHG PXVEDQHWGLDQSRISKE DSVLHR  
JHQRW\SH VDPSOLQJ IRU PROHFXODU JHQHWLF DQDO\VLV  
)XUWKHUPRUH , DWWHQGHG WKH ZHHNO\ ELRLQIRUPDWLF\  
RQ WKH SURJUHVV DQG RXWFRPHV RI WKELGHQDQVIRVLDOWLF  
VWXRG\ 'UV %LO\HX\ V DQG 6FDERR\ V JURXS DQG WKHLU 3K' F

'U %LO\HX\ V ZRUN RQ JHQH GLVFRYHULHV PDLQWHQDQFH D  
UHVXRUFHV JHQHWLF DGYDQFHPHQW DQG SUHFLVLRQ EU  
GHYHORSHPHQWLPISQRZHQGURS FXOWLYDUV , WUHDVXUH L  
PDNH RXU UHVHDFK SURJUDPV LQQRYDWLYH DQG DW WK  
VFLHQFH

Genomic data analysis

, GUDIWHG D WH[WERRN RQ UHVHDFK PHWKRGRORJ\ IRU W  
LQ DJULFXOWXUDO VFLHQFHV SRVWJUDGXDWH VWXGHQW  
DJULFXOWXUDO HGXFDWRUV DQG UHVHDFKFWILUWHQJLQJH  
DQG JHQRPLF GDWD DQDO\VLV GXULQJ WKLV VFLHQWLILF  
UHYLHZHEGWLKHSULQRIOSHFXORU JHQHWLF SDUDPHWRU DQG  
PROHFXODU GDWD DVVHPEO\ DQG DQDO\VLV WRLFRVFXWDHQ  
GHGXFH SRSXODWLRQ VWUXFWXUHV RI WHVW JHQRW\SHV L  
GDWD DQDO\VLV ZHUH FUXFLDO WR GHYHORSLQJ WKH GUD  
XQGHUJUDGXDWH DQG SRVWJUDGXDWH SODQWD EDQDQV





A

B

C

D

)LJXUHR\EHDQ URRW SKHQRW\SLQJ DW 5ROOLQV ERWWRP  
\$ URRW LPDJH DQDO\VLV IURP GLIIHUHQW DQJOHV GURC  
,

1HWZRUNLQJ DQG FRSORJUE\RXU\DLWLRQ\

x ,Q WKH ODVW ZHDNLRIY\XO\UG\WRID\H 0HUVKD\TV ODE DW W  
RI &LQFLQQDWL 2KLR JH\OH\DD\Q\HG\QW\SH\D\X\H\Q\W\R\Q\Q\IRUPDWL  
WRROV DQG FORXG FRPSXWLQJ SU\W\J\DD\Q\W\O\X\W\H\X\O\O\OR\U\H\V  
SODQW JH\Q\Y\H\O\Y\FL\Q\J\PXOWLGLVFLSOLQDU\ WHDPV

x , YLVLWHG WKH 8QLYHUVI&K\DR\SD\DJ\Q\Q\8\B\& 8\PE\DD\X\V\W  
DOORZHG PH WR GLVFXVV ZLWK W\K\H\U\G\H\A\E\B\I\D\K\,Q\Q\O\D\W\R\E  
DQ\G\H\H\W\8\8\FDPSXV DQG 5HV\H\B\I\S\U\R\G\K\H\W\EX\M\VL\R\Q\ZLWK  
6\,\ WHDP LQF\O\X\W\H\U\\*R\O\G\V\PL\WK\%ULDQ 7\H\U\D\E\B\O\G\5L\V  
YL\V\O\G\LQ\W\H\Z\LD\O\W\S\R\W\H\Q\W\LD\O\O\IRUJH FROODERUDWLRQ

7KURXJK W\K\H\D\G\O\H\W\H\FURSSLQJ V\V\W\H\P\V\VSDQQQLQJ WK  
DQG ,OOL\Z\O\V\H\I\FL\W\H\G\H\Z\R\J\H\G\H\U\D\W\H\R\Q\ PDLJH YDULHW\Z  
SODQW HUHF\W\H\O\B\I\W\H\I\S\H\VKR\U\G\SD\O\H\Q\W\K\H\J\K\O\Q\W  
GHQV\J\W\X\U\H



