

UM/UWC Linkage Program

/LQNDJH 5HSRUWV

6XEPLWWHG E\ 'U 0DUVKDOO .H\VWHU
'HSDUWPHQW RI %LRWHFKQRORJ\

8QLYHUVLW\ RI WKH :HVWHUQ &DSH

+RVWHG E\ 3URI \$QWMH +HHVH 'HSDUWPHQW RI %LRF
0HQGR]D &R]DWO 'LYLVLRQ RI 3ODQW 6FLHQF



9LVLVW SHULRG

6HSWHPEHU

WR 1RYHPEH

5HFHQW VWXGLHV VKRZ WKDW D IXQFWLRQDO YHVLFXODU
WUDIILFNLQJ RI SURWHLQV WR DQG IURP WKH 30 SOD\ V D
DEXQGDQFH DW WKHLU VLWH RI IXQFWLRQ QDPHO\ WKH
SDWKZD\ V WKDW FRQWULEXWH WR PRGXODWLQJ WKH FRP
HQGRF\WRVLV ,Q VHFUHWLRQ QHZO\ V\QWKHVLJHG SU
(QGRSODVPLF 5HWLFXOXP (5 WR WKH 30 (QGRF\WRVLV
SODQW FHOOV UHPRYH DQG LQWHUQDFPLUÀ WHUQDFPE p
SOLFOPO

,RQRPLF SURILOLQJ 3URI 0HQGRJD &RJDWO RI WUD
SODQWV H[SRVHG KHDY\ PHWDO LGHQWLILHG LQ

5HVXOWV IURP DQG ZRXOG JLYH XV DQ LGHD RI Z
LRQV PD\ EH DIIHFWHG LQ HDFK RI WKH PXWDQWV 7KL
WDUJHWHG DSSURDFK WR VWDUW WUDQVIRUPLQJ WKH PX
ZLWK IOXRUVFHWQ SURWHLQV WR ORRN DW SRWHQWLDQ
OLYH FHOOLPDJLQJ 3URI +HHVH V ODE DV ZHOOLV ZL
0HQGRJD &RJDWO V RSWLPLJHG ODE DSSURDFKHV

\$V D ORQJ WHUP JRDO ZH DOVR H[SHFW WR SXUVXH
:DOWHU *DVVPDQQ 08 ,3* WR WHVW WKH WUDQVSRUWH
RRF\WHV 7KHVH H[SHULPHQWV ZLOO JLYH XV LQVLJKW LQ
RI VHOHFWHG KHDY\ PHWDO WUDQVSRUWHV

\$IWHU JURZLQJ YHVLFOH PXWDQWV ZLWK RU ZLWKR
LVRODWH HQULFKHG SODVPD PHPEUDQHV ZLWK RU ZLWK
W\SH DQG WKHQ LQ FROODERUDWLRQ ZLWK 3URIH6FRWW
TXDQWLWDWLYH PDVV VSHF DQDO\HV WR FRPSDUH WK
GLIIHUHQW JURZWK FRQGLWLRQV

WpH0UR DwgKaHprojct 7pEhG D_7°H àHG SHUIRUPUP @Y 97°H °eHf FRPSDUD

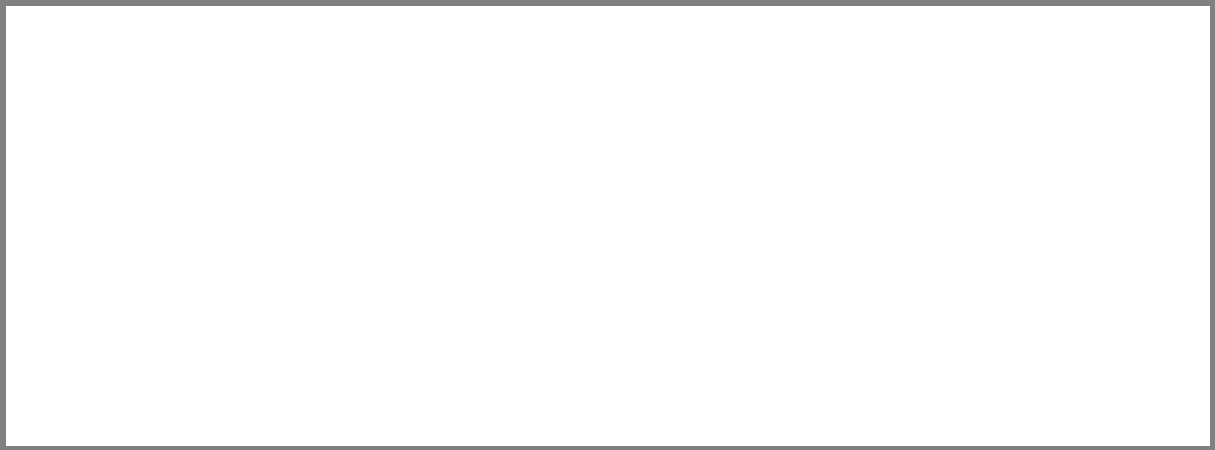
Deviations from the original timeline

'XH WR SHUVRQDO FRPPLWPHQWV LQ 'U .H\VWHUUV VFKH
WULS WR &ROXPELD 0LVVRXUL 7KHUHIRWKH 6KISVCHPEH & D
DQG DUULYHG LQ &ROXPELD 6HSRWHPEH WKH +H WKH
0LVVRXUL RQRWKNRYHPEHU DQG DUULYHG EDFN^{UG} LQ &D
RI 1RYHPEHU 'XH WR WKH VKRUWHU VFKHGXOH ZH G
VFUHHQLQJ RI WKH PXWDQWV RQ WKH VDPH GD\ DV WKH K

Preliminary Results obtained

Screening the vesicular trafficking (ves) mutants for Cd tolerance

7KH FRQWURO &RO ves5Des6 ves4WDDes6ves4 ZHUH VSRQVRUH
E\ 3URI +HHVH of 78-2 HUFHQWU RO IRU LURQ GHILFLHQF\ DQG
ZDV VSRQVRUH E\ 3URI 0HQGR]D &R]DWO 6HHGV ZHUH
RQO\ SODWHV LURQ GHILFLHQW SODWHV FRQWDLQLQ
SODWHV FRQWDLQLQJ —0 &G 6HHGV ZHUH DOORZHO
FRQWUROOHG HQYLURQPHQWDO FKDPEHUV \$IWHU GD
GLJLWDO SKRWRJUDSK\)LJ :H REVHUYHG JUHHQ OHD
DV ZHOO DV SURSHU URRW IRUPDWLRQ)XUWKHUPRUH D
LURQ GHILFLHQW SODWHV ves6Des4 SXUWREPHGYDWHREHVVW
GHILFLHQW FRQGLWLRQV :KHQ WKH SODWQV^{Des4}UH H[SR
ZHUH REVHUYDEO\ PRUH WROHUDQW WR FDGPLXP WKH
H[SHF^{Des4} ZDV VHQVLWLYH WR ERWK LURQ GHILFLHQF\ DG



)LJ 5HSUHVHQWDWLYH 0XUDVKLJH DQG 6NRRJ 06es PJXWDSODWHG KRQWUR
 SODWH FRQWDLQV 0XUDVKLJH DQG 6NRRJ PHGLXP ZLWK DJDU RQO\ 7KH ,U
 DQG 6NRRJ PHGLXP ZLWK DJDU DQG VXSSOHPHQWHG ZLWK)HUURJLQH 7KH
 PHGLXP ZLWK DJDU DQG VXSSOHPHQWHG ZLWK LGFOKHG DV D SKHQRW\SH
 VHHGV ZHUH SODWHG DQG JURZQ IRU GD\ DW f & LQ D K OLJKW K
 FKDPEHUV

Microscopic observation of screened vesicular trafficking (**ves**) mutants

\$IWHU GLJLWDO SKRWRJUDSK\ SODQWV ZHUH VXEMHFWH
 WKH SKRWRJUDSK\ REVHUYDWLRQV SODQWV ZHUH JUHHO
 V\QWKHVLV+RZJYHU ZKHQ SODQWV ZHUH H[SRVHG WR LU
 OHDI \HOORZLQJ ZDV REVHUYHG YHUH YHUH \HOORZLQJ ZKH
 H[SRVHG WR FDGPLXP)LJ EXW QRW DV VHYHUH DV LQ



)LJ 5HSUHVHQWDWLYH PLFURVFRSLF LPDJHV RI 0XUDVKLJH DQG 6NRRJ
ves PXWDQWV



)LJ 5HSUHVHQWDWLYH PLFURVFRSLF LPDJHV RI 0XUDVKLJH DQG 6NRRJ
)HUURJLQH XVHG IRU ves PXWDQWV LQJ RI



)LJ 5HSUHVHQWDWLYH PLFURVFRSLF LPDJHV RI 0XUDVKLJH DQG 6NRRJ P
XVHG IRU SKHQVSWQQRV

Fresh weight measurement of **ves** mutants

:H LQYHVWLJDWHG WKH HIIHFW RI LURQ GHILFLHQF\ DO
ELRPDVV REWDLQHG DIWHU GLJLWDO SKRWRJUDSK\)LJ
:H XVHG WKUHH VHHGOLQJV RI VLPLODU VLJH WR PHDVX
:H FDOFXODWHG WKH DYHUDJH IUHVK ZHLJKW RI WKH VH
VHWV RI VHHGOLQJV Q ves5 DQESves4 HZHUWKDW DYDLHU WK
&RO DQG WKB-DWQEs4 ZHLJKHG WKH OHDVW RI DOO WKH
)XUWKHUPRUH Dp3-2HSDHFWKB PRVW VHQVLWLYH WR LURQ
IROORZves6 EYves4 PXWDQW ZDV WKH PRVW WROHUDQW W
WKB5 PXWDQW

)LJ 6HHGOLQJ IUHVes ZPHXWDQ VRY WUKP FRQWURO)HUUR]LQH DQG &G 06
ZHLJKHG DV VHWV RI DQG DW OHDVW UHSOLFDWHV ZHUH PHDVXUHG SHU

Screening of a second set of **ves** mutants for Cd tolerance

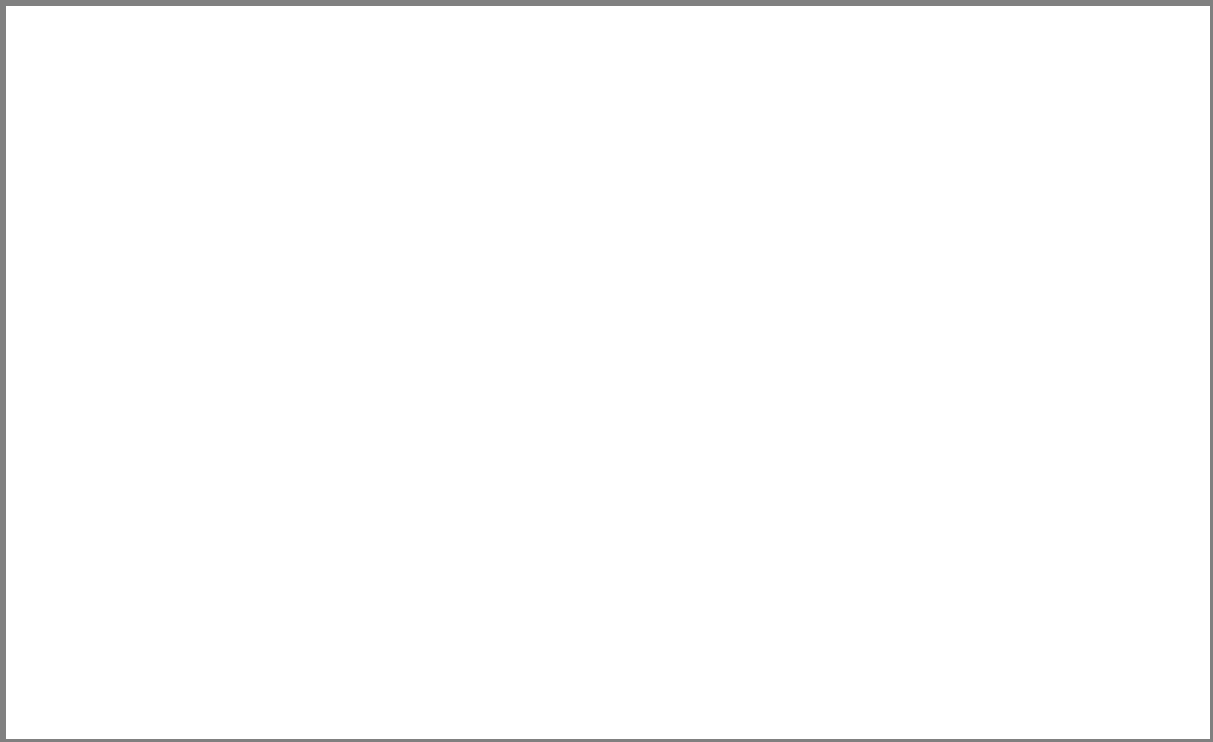
6HHGV ZHUH VWHULOL]HG DQG SODWHG RQ 06 RQO\
FRQWDLQLQJ)HUUR]LQH DQG FDGPLXP FRQWDLQLQJ S
)XUWKHUPRUH VHHGV ZHUH DOORZHG WR JHUPLQDWH
HQYLURQPHQWDO FKDPEHUV K OLJKW K GDUN F\FOH
SURFHVVHG E\ GLJLWDO SKRWRJUDSK\)LJ :H REVHU
SODWHG RQ WKH 06 SODWHV :H REVHUYHG SURSHU UR
H[FHSW ~~ves3 W X W D Q W~~ PXWDQW VKRZHG D ³VPDOO URRW
SODWHV)XU ~~W X W D Q W~~ & GLG QRW SHUIRUP ZHOO RQ WK
SODWHV ~~ves1 X H D Q G s2~~ SHUIRUPHG REVHUYDEO\ EHWWHU XQC
:KHQ WKH SODQWV ZHUH H[~~ves1 ves2~~ R ZH ~~ves1 ves2~~ PRUH
WROHUDQW WR LURQ GHILFLHQF\ ZHUH REVHUYDEO\ PRU
WKH PXWDQWV \$JD~~ves3~~2DZDWH[~~ves1 ves2~~GLYH WR ERWK LURQ
FDGPLXP VWUHV



)LJ 5HSUHVHQWDWLYH PLFURVFRSLF LPDJHV RI 0XUDVKLJH DQG 6NRRJ 06
PXWDQWV ~~Yes, Yes 2 DQES B QXWDQWV~~



)LJ 5HSUHVHQWDWLYH PLFURVFRSLF LPDJHV RI 0XUDVKLJH DQG 6NRRJ
)HUURJLQH XVHG IRU ~~Yes, Yes 2 DQES B QXWDQWV~~



)LJ 6HHGOLQJ IUHVK ZHLJKW RI WKH VHW PXWDQWV IURP FRQWURO)HU
ZHLJKHG DV VHWV RI DQG DW OHDVW UHSOLFDWHV ZHUH PHDVXUHG SHU



)LJ ,&3 2(6 TXDQWLILFDWLRQ RI &G DQG)H DIWHU



)LJ ,&3 2(6 TXDQWLILFOQDLRCHURIV&XV&3PZDQWRSDJJDWHG LQ K\GURSRQLFV
DQG FG VROXWLRQV

)RU]LQF FRQWHQW ZH REVHUYHG PRUH]LQF Q&DWIN &R
XQGHU FRQWURO FRQGLW]LROFVFRQWHQW GLG QRW VWDW
ERWK SODQWV ZHUH H[SRVHG WR FDGPLXP 1RQHWKHOHV
]LQFV&3 URRWV WKDQ LQ &RO URRWV XQGHU FRQWURO
SODQWV ZHUH H[SRVHG WR FDGPLXP ZH REVHUYHG D GHF



)LJ ,&3 2(6 TXDQWLILFOQDLRCHURIV&XV&3PZDQWRSDJJDWHG LQ K\GURSRQLFV F
VROXWLRQV

Other outputs

3. Mizzou events - Dr. Marshall Keyster seminar

HL \$rU % øNbÈ1 Nì@ 4(r)-er_y-mersn-6-3()ITJEMC /P <</MCI5.0 >>BDC /C2_0.12
K W W S F D O H 9 d` @U 5 F 5cV5\$€ DU LF 0 T` p D HEW 6F WBD O 0 cBDV0 A € • F