

Rc	MAGGEAHAALQAVASLRWYSLWQLCPHQGSSLVWEGHYNGAVKTRKSTVMQPPAAEEEDDADHAARHRSRQLRELY	80
rc	MAGGEAHAALQAVASLRWYSLWQLCPHQGSSLVWEGHYNGAVKTRKSTVMQPPAAEEEDDADHAARHRSRQLRELY	80
X134-#2†	MAGGEAHAALQAVASLRWYSLWQLCPHQGSSLVWEGHYNGAVKTRKSTVMQPPAAEEEDDADHAARHRSRQLRELY	80
X134-#5	MAGGEAHAALQAVASLRWYSLWQLCPHQGSSLVWEGHYNGAVKTRKSTVMQPPAAEEEDDADHAARHRSRQLRELY	80
X134-#9 (2)	MAGGEAHAALQAVASLRWYSLWQLCPHQGSSLVWEGHYNGAVKTRKSTVMQPPAAEEEDDADHAARHRSRQLRELY	80
X134-#11	MAGGEAHAALQAVASLRWYSLWQLCPHQGSSLVWEGHYNGAVKTRKSTVMQPPAAEEEDDADHAARHRSRQLRELY	80
S143-#14	MAGGEAHAALQAVASLRWYSLWQLCPHQGSSLVWEGHYNGAVKTRKSTVMQPPAAEEEDDADHAARHRSRQLRELY	80
S143-#15‡	MAGGEAHAALQAVASLRWYSLWQLCPHQGSSLVWEGHYNGAVKTRKSTVMQPPAAEEEDDADHAARHRSRQLRELY	80
S143-#25	MAGGEAHAALQAVASLRWYSLWQLCPHQGSSLVWEGHYNGAVKTRKSTVMQPPAAEEEDDADHAARHRSRQLRELY	80
S143-#31 (1)	MAGGEAHAALQAVASLRWYSLWQLCPHQGSSLVWEGHYNGAVKTRKSTVMQPPAAEEEDDADHAARHRSRQLRELY	80
S143-#32	MAGGEAHAALQAVASLRWYSLWQLCPHQGSSLVWEGHYNGAVKTRKSTVMQPPAAEEEDDADHAARHRSRQLRELY	80
ZNS-#15	MAGGEAHAALQAVASLRWYSLWQLCPHQGSSLVWEGHYNGAVKTRKSTVMQPPAAEEEDDADHAARHRSRQLRELY	80
ZNS-#25	MAGGEAHAALQAVASLRWYSLWQLCPHQGSSLVWEGHYNGAVKTRKSTVMQPPAAEEEDDADHAARHRSRQLRELY	80

Rc	DWLQAGENS SGGVQTSSTASRRPGAALSPEDLTETEWFFLMSASYSFPPGIGLPGRAFARRGHVWLTGANEVDSKVFL	160
rc	DWLQAGENS SGGVQTSSTASRRPGAALSPEDLTETEWFFLMSASYSFPPGIGLPGRAFARRGHVWLTGANEVDSKVFL	160
X134-#2	DWLQAGENS SGGVQTSSTASRRPGAALSPEDLTETEWFFLMSASYSFPPGIGLPGRAFARRGHVWLTGANEVDSKVFL	160
X134-#5	DWLQAGENS SGGVQTSSTASRRPGAALSPEDLTETEWFFLMSASYSFPPGIGLPGRAFARRGHVWLTGANEVDSKVFL	160
X134-#9 (2)	DWLQAGENS SGGVQTSSTASRRPGAALSPEDLTETEWFFLMSASYSFPPGIGLPGRAFARRGHVWLTGANEVDSKVFL	160
X134-#11	DWLQAGENS SGGVQTSSTASRRPGAALSPEDLTETEWFFLMSASYSFPPGIGLPGRAFARRGHVWLTGANEVDSKVFL	160
S143-#14	DWLQAGENS SGGVQTSSTASRRPGAALSPEDLTETEWFFLMSASYSFPPGIGLPGRAFARRGHVWLTGANEVDSKVFL	160
S143-#15	DWLQAGENS SGGVQTSSTASRRPGAALSPEDLTETEWFFLMSASYSFPPGIGLPGRAFARRGHVWLTGANEVDSKVFL	160
S143-#25	DWLQAGENS SGGVQTSSTASRRPGAALSPEDLTETEWFFLMSASYSFPPGIGLPGRAFARRGHVWLTGANEVDSKVFL	160
S143-#31 (1)	DWLQAGENS SGGVQTSSTASRRPGAALSPEDLTETEWFFLMSASYSFPPGIGLPGRAFARRGHVWLTGANEVDSKVFL	160
S143-#32	DWLQAGENS SGGVQTSSTASRRPGAALSPEDLTETEWFFLMSASYSFPPGIGLPGRAFARRGHVWLTGANEVDSKVFL	160
ZNS-#15	DWLQAGENS SGGVQTSSTASRRPGAALSPEDLTETEWFFLMSASYSFPPGIGLPGRAFARRGHVWLTGANEVDSKVFL	160
ZNS-#25	DWLQAGENS SGGVQTSSTASRRPGAALSPEDLTETEWFFLMSASYSFPPGIGLPGRAFARRGHVWLTGANEVDSKVFL	160

Rc	RAILAKTVVCI PVVDGVLEIGTTEKVEEDMGLIQYARGIFMDQHG IHMKPTLSQHSSTNPVTHCTHQHP IQVQMQLGITS	240
rc	RAILAKTVVCI PVVDGVLEIGTTEKVEEDMGLIQYARGIFMDQHG IHMKPTLSQHSSTNPVTHCTHQHP IQVQMQLGITS	240
X134-#2	RAILAKTVVCI PVVDGVLEIGTTEKVEEDMGLIQYARGIFMDQHG IHMKPTLSQHSSTNPVTHCTHQHP IQVQMQLGITS	240
X134-#5	RAILAKTVVCI PVVDGVLEIGTTEKVEEDMGLIQYARGIFMDQHG IHMKPTLSQHSSTNPVTHCTHQHP IQVQMQLGITS	240
X134-#9 (2)	RAILAKTVVCI PVVDGVLEIGTTEKVEEDMGLIQYARGIFMDQHG IHMKPTLSQHSSTNPVTHCTHQHP IQVQMQLGITS	240
X134-#11	RAILAKTVVCI PVVDGVLEIGTTEKVEEDMGLIQYARGIFMDQHG IHMKPTLSQHSSTNPVTHCTHQHP IQVQMQLGITS	240
S143-#14	RAILAKTVVCI PVVDGVLEIGTTEKVEEDMGLIQYARGIFMDQHG IHMKPTLSQHSSTNPVTHCTHQHP IQVQMQLGITS	240
S143-#15	RAILAKTVVCI PVVDGVLEIGTTEKVEEDMGLIQYARGIFMDQHG IHMKPTLSQHSSTNPVTHCTHQHP IQVQMQLGITS	240
S143-#25	RAILAKTVVCI PVVDGVLEIGTTEKVEEDMGLIQYARGIFMDQHG IHMKPTLSQHSSTNPVTHCTHQHP IQVQMQLGITS	240
S143-#31 (1)	RAILAKTVVCI PVVDGVLEIGTTEKVEEDMGLIQYARGIFMDQHG IHMKPTLSQHSSTNPVTHCTHQHP IQVQMQLGITS	240
S143-#32	RAILAKTVVCI PVVDGVLEIGTTEKVEEDMGLIQYARGIFMDQHG IHMKPTLSQHSSTNPVTHCTHQHP IQVQMQLGITS	240
ZNS-#15	RAILAKTVVCI PVVDGVLEIGTTEKVEEDMGLIQYARGIFMDQHG IHMKPTLSQHSSTNPVTHCTHQHP IQVQMQLGITS	240
ZNS-#25	RAILAKTVVCI PVVDGVLEIGTTEKVEEDMGLIQYARGIFMDQHG IHMKPTLSQHSSTNPVTHCTHQHP IQVQMQLGITS	240

Rc	QTKFDYSDELNADEENDTTEEGMSGSDTNNDTERNSGQLQLQMQDQLNMVSNHDQTIPNNAVSSSELMQCEMSEVVRDG	320
rc	QTKFDYSDELNADEENDTTEEGMSGSDTNNDTERNSGQLQLQMQDQLNMVSNHDQTIPNNAVSSSELMQCEMSEVVRDG	320
X134-#2	QTKFDYSDELNADEENDTTEEGMSGSDTNNDTERNSGQLQLQMQDQLNMVSNHDQTIPNNAVSSSELMQCEMSEVVRDG	320
X134-#5	QTKFDYSDELNADEENDTTEEGMSGSDTNNDTERNSGQLQLQMQDQLNMVSNHDQTIPNNAVSSSELMQCEMSEVVRDG	320
X134-#9 (2)	QTKFDYSDELNADEENDTTEEGMSGSDTNNDTERNSGQLQLQMQDQLNMVSNHDQTIPNNAVSSSELMQCEMSEVVRDG	320
X134-#11	QTKFDYSDELNADEENDTTEEGMSGSDTNNDTERNSGQLQLQMQDQLNMVSNHDQTIPNNAVSSSELMQCEMSEVVRDG	320
S143-#14	QTKFDYSDELNADEENDTTEEGMSGSDTNNDTERNSGQLQLQMQDQLNMVSNHDQTIPNNAVSSSELMQCEMSEVVRDG	320
S143-#15	QTKFDYSDELNADEENDTTEEGMSGSDTNNDTERNSGQLQLQMQDQLNMVSNHDQTIPNNAVSSSELMQCEMSEVVRDG	320
S143-#25	QTKFDYSDELNADEENDTTEEGMSGSDTNNDTERNSGQLQLQMQDQLNMVSNHDQTIPNNAVSSSELMQCEMSEVVRDG	320
S143-#31 (1)	QTKFDYSDELNADEENDTTEEGMSGSDTNNDTERNSGQLQLQMQDQLNMVSNHDQTIPNNAVSSSELMQCEMSEVVRDG	320
S143-#32	QTKFDYSDELNADEENDTTEEGMSGSDTNNDTERNSGQLQLQMQDQLNMVSNHDQTIPNNAVSSSELMQCEMSEVVRDG	320
ZNS-#15	QTKFDYSDELNADEENDTTEEGMSGSDTNNDTERNSGQLQLQMQDQLNMVSNHDQTIPNNAVSSSELMQCEMSEVVRDG	320
ZNS-#25	QTKFDYSDELNADEENDTTEEGMSGSDTNNDTERNSGQLQLQMQDQLNMVSNHDQTIPNNAVSSSELMQCEMSEVVRDG	320

Rc	CSNNILEDEIQMLMDCQNSNCQLNLQGPDEPCHSWHFLCEELQNDYQPATEDQVASPENTHYPKTLMTILHYNTRQQEM	400
rc	CSNNILEDEIQMLMDCQNSNCQLNLQGPDEPCHSWHFLCEELQNDYQPATEDQVASPENTHYPKTLMTILHYNTRQQEM	400
X134-#2	CSNNILEDEIQMLMDCQNSNCQLNLQGPDEPCHSWHFLCEELQNDYQPATEDQVASPENTHYPKTLMTILHYNTRQQEM	400
X134-#5	CSNNILEDEIQMLMDCQNSNCQLNLQGPDEPCHSWHFLCEELQNDYQPATEDQVASPENTHYPKTLMTILHYNTRQQEM	400
X134-#9 (2)	CSNNILEDEIQMLMDCQNSNCQLNLQGPDEPCHSWHFLCEELQNDYQPATEDQVASPENTHYPKTLMTILHYNTRQQEM	400
X134-#11	CSNNILEDEIQMLMDCQNSNCQLNLQGPDEPCHSWHFLCEELQNDYQPATEDQVASPENTHYPKTLMTILHYNTRQQEM	400
S143-#14	CSNNILEDEIQMLMDCQNSNCQLNLQGPDEPCHSWHFLCEELQNDYQPATEDQVASPENTHYPKTLMTILHYNTRQQEM	400
S143-#15	CSNNILEDEIQMLMDCQNSNCQLNLQGPDEPCHSWHFLCEELQNDYQPATEDQVASPENTHYPKTLMTILHYNTRQQEM	400
S143-#25	CSNNILEDEIQMLMDCQNSNCQLNLQGPDEPCHSWHFLCEELQNDYQPATEDQVASPENTHYPKTLMTILHYNTRQQEM	400
S143-#31 (1)	CSNNILEDEIQMLMDCQNSNCQLNLQGPDEPCHSWHFLCEELQNDYQPATEDQVASPENTHYPKTLMTILHYNTRQQEM	400
S143-#32	CSNNILEDEIQMLMDCQNSNCQLNLQGPDEPCHSWHFLCEELQNDYQPATEDQVASPENTHYPKTLMTILHYNTRQQEM	400
ZNS-#15	CSNNILEDEIQMLMDCQNSNCQLNLQGPDEPCHSWHFLCEELQNDYQPATEDQVASPENTHYPKTLMTILHYNTRQQEM	400
ZNS-#25	CSNNILEDEIQMLMDCQNSNCQLNLQGPDEPCHSWHFLCEELQNDYQPATEDQVASPENTHYPKTLMTILHYNTRQQEM	400

Supplemental Figure 3. Multiple alignment of the deduced amino acid sequences of in-frame *Rc* variants.

†X134-#2, X134-#4, X134-#9(1), S143-#21, ZNS-#2, ZNS-#3, ZNS-#4, ZNS-#7, ZNS-#9, ZNS-#19, ZNS-#20, ZNS-#22, and ZNS-#24 had an identical amino acid sequence.

‡ S143-#15, S143-#18, S143-#31(2) had an identical amino acid sequence.

Rc	NIKNYLPVSEKSSFSRWTTPEGSDDNKTMISPGTTQRLMKSILMIVPSSHCSYRGAETPESRGGKGASGTRVKVGAIQGDF	480
rc	NIKNYLPVSEKSSFSRWTTPEGSDDNKTMISPGTTQRLMKSILMIVPSSHCSYRGAETPESRGGKGASGCHPR*-----	473
X134-#2†	NIKNYLPVSEKSSFSRWTTPEGSDDNKTMISPGTTQRLMKSILMIVPSSHCSYRGAETPESRGGKGASG-----CIQGDF	475
X134-#5	NIKNYLPVSEKSSFSRWTTPEGSDDNKTMISPGTTQRLMKSILMIVPSSHCSYRGAETPESRGGKGASG-----CIYDDF	475
X134-#9 (2)	NIKNYLPVSEKSSFSRWTTPEGSDDNKTMISPGTTQRLMKSILMIVPSSHCSYRGAETPESRGGKGASG-----DF	470
X134-#11	NIKNYLPVSEKSSFSRWTTPEGSDDNKTMISPGTTQRLMKSILMIVPSSHCSYRGAETPESRGGKGASG-----CDF	472
S143-#14	NIKNYLPVSEKSSFSRWTTPEGSDDNKTMISPGTTQRLMKSILMIVPSSHCSYRGAETPESRGGKGASG-----CIRDDF	475
S143-#15‡	NIKNYLPVSEKSSFSRWTTPEGSDDNKTMISPGTTQRLMKSILMIVPSSHCSYRGAETPESRGGKGASG-----CHQGDF	475
S143-#25	NIKNYLPVSEKSSFSRWTTPEGSDDNKTMISPGTTQRLMKSILMIVPSSHCSYRGAETPESRGGKGASG-----CNQGDF	475
S143-#31 (1)	NIKNYLPVSEKSSFSRWTTPEGSDDNKTMISPGTTQRLMKSILMIVPSSHCSYRGAETPESRGGKGASG-----AIQGDF	475
S143-#32	NIKNYLPVSEKSSFSRWTTPEGSDDNKTMISPGTTQRLMKSILMIVPSSHCSYRGAETPESRGGKGASG-----FQGDF	474
ZNS-#15	NIKNYLPVSEKSSFSRWTTPEGSDDNKTMISPGTTQRLMKSILMIVPSSHCSYRGAETPESRGGKGASG-----CLYGDF	475
ZNS-#25	NIKNYLPVSEKSSFSRWTTPEGSDDNKTMISPGTTQRLMKSILMIVPSSHCSYRGAETPESRGGKGASG-----QGDF	472

bHLH

Rc	SANHV VLKERRRREKLN EFII LRSLVPFMTKMDKASILGDTIEYVKQLRNRIQE LESSSSSSRAAARAPSA AAAA GRRRKR	560
rc	-----	473
X134-#2	SANHV VLKERRRREKLN EFII LRSLVPFMTKMDKASILGDTIEYVKQLRNRIQE LESSSSSSRAAARAPSA AAAA GRRRKR	555
X134-#5	SANHV VLKERRRREKLN EFII LRSLVPFMTKMDKASILGDTIEYVKQLRNRIQE LESSSSSSRAAARAPSA AAAA GRRRKR	555
X134-#9 (2)	SANHV VLKERRRREKLN EFII LRSLVPFMTKMDKASILGDTIEYVKQLRNRIQE LESSSSSSRAAARAPSA AAAA GRRRKR	550
X134-#11	SANHV VLKERRRREKLN EFII LRSLVPFMTKMDKASILGDTIEYVKQLRNRIQE LESSSSSSRAAARAPSA AAAA GRRRKR	552
S143-#14	SANHV VLKERRRREKLN EFII LRSLVPFMTKMDKASILGDTIEYVKQLRNRIQE LESSSSSSRAAARAPSA AAAA GRRRKR	555
S143-#15	SANHV VLKERRRREKLN EFII LRSLVPFMTKMDKASILGDTIEYVKQLRNRIQE LESSSSSSRAAARAPSA AAAA GRRRKR	555
S143-#25	SANHV VLKERRRREKLN EFII LRSLVPFMTKMDKASILGDTIEYVKQLRNRIQE LESSSSSSRAAARAPSA AAAA GRRRKR	555
S143-#31 (1)	SANHV VLKERRRREKLN EFII LRSLVPFMTKMDKASILGDTIEYVKQLRNRIQE LESSSSSSRAAARAPSA AAAA GRRRKR	555
S143-#32	SANHV VLKERRRREKLN EFII LRSLVPFMTKMDKASILGDTIEYVKQLRNRIQE LESSSSSSRAAARAPSA AAAA GRRRKR	554
ZNS-#15	SANHV VLKERRRREKLN EFII LRSLVPFMTKMDKASILGDTIEYVKQLRNRIQE LESSSSSSRAAARAPSA AAAA GRRRKR	555
ZNS-#25	SANHV VLKERRRREKLN EFII LRSLVPFMTKMDKASILGDTIEYVKQLRNRIQE LESSSSSSRAAARAPSA AAAA GRRRKR	552

Rc	SAAAAATAAEGMSSSNGRNGGEEAAEVVQVSIIESDALLELRCGCGGGGGVVLLRVMQAMQELQLEVTAVQASCAGGEL	640
rc	-----	473
X134-#2	SAAAAATAAEGMSSSNGRNGGEEAAEVVQVSIIESDALLELRCGCGGGGGVVLLRVMQAMQELQLEVTAVQASCAGGEL	635
X134-#5	SAAAAATAAEGMSSSNGRNGGEEAAEVVQVSIIESDALLELRCGCGGGGGVVLLRVMQAMQELQLEVTAVQASCAGGEL	635
X134-#9 (2)	SAAAAATAAEGMSSSNGRNGGEEAAEVVQVSIIESDALLELRCGCGGGGGVVLLRVMQAMQELQLEVTAVQASCAGGEL	630
X134-#11	SAAAAATAAEGMSSSNGRNGGEEAAEVVQVSIIESDALLELRCGCGGGGGVVLLRVMQAMQELQLEVTAVQASCAGGEL	632
S143-#14	SAAAAATAAEGMSSSNGRNGGEEAAEVVQVSIIESDALLELRCGCGGGGGVVLLRVMQAMQELQLEVTAVQASCAGGEL	635
S143-#15	SAAAAATAAEGMSSSNGRNGGEEAAEVVQVSIIESDALLELRCGCGGGGGVVLLRVMQAMQELQLEVTAVQASCAGGEL	635
S143-#25	SAAAAATAAEGMSSSNGRNGGEEAAEVVQVSIIESDALLELRCGCGGGGGVVLLRVMQAMQELQLEVTAVQASCAGGEL	635
S143-#31 (1)	SAAAAATAAEGMSSSNGRNGGEEAAEVVQVSIIESDALLELRCGCGGGGGVVLLRVMQAMQELQLEVTAVQASCAGGEL	635
S143-#32	SAAAAATAAEGMSSSNGRNGGEEAAEVVQVSIIESDALLELRCGCGGGGGVVLLRVMQAMQELQLEVTAVQASCAGGEL	634
ZNS-#15	SAAAAATAAEGMSSSNGRNGGEEAAEVVQVSIIESDALLELRCGCGGGGGVVLLRVMQAMQELQLEVTAVQASCAGGEL	635
ZNS-#25	SAAAAATAAEGMSSSNGRNGGEEAAEVVQVSIIESDALLELRCGCGGGGGVVLLRVMQAMQELQLEVTAVQASCAGGEL	632

Rc	LAELRAKVVVMILICMKMQMQMQN*	666
rc	-----	473
X134-#2	LAELRAKVVVMILICMKMQMQMQN*	661
X134-#5	LAELRAKVVVMILICMKMQMQMQN*	661
X134-#9 (2)	LAELRAKVVVMILICMKMQMQMQN*	656
X134-#11	LAELRAKVVVMILICMKMQMQMQN*	658
S143-#14	LAELRAKVVVMILICMKMQMQMQN*	661
S143-#15	LAELRAKVVVMILICMKMQMQMQN*	661
S143-#25	LAELRAKVVVMILICMKMQMQMQN*	661
S143-#31 (1)	LAELRAKVVVMILICMKMQMQMQN*	661
S143-#32	LAELRAKVVVMILICMKMQMQMQN*	660
ZNS-#15	LAELRAKVVVMILICMKMQMQMQN*	661
ZNS-#25	LAELRAKVVVMILICMKMQMQMQN*	658

Supplemental Figure 3. Multiple alignment of the deduced amino acid sequences of in-frame Rc variants (continued).

†X134-#2, X134-#4, X134-#9(1), S143-#21, ZNS-#2, ZNS-#3, ZNS-#4, ZNS-#7, ZNS-#9, ZNS-#19, ZNS-#20, ZNS-#22, and ZNS-#24 had an identical amino acid sequence.

‡S143-#15, S143-#18, S143-#31(2) had an identical amino acid sequence.