

## SGX CFTR Clone Information

*This document captures legacy and source information related to a collaboration between CFFT and SGX Pharmaceuticals. This collaboration, active between December 2000 and September 2008, was intended to support expression, purification and crystallization studies of CFTR protein subdomain structures performed by SGX and funded by CFFT. In the latter part of the collaboration, SGX used their FAST technology platform to search for small molecules that bound to the NBD1 subdomain of CFTR, with the intent to evaluate such molecules for their ability to correct the processing and activity defects found in the F508del mutation of CFTR. The program ended when SGX was acquired by Lilly Pharmaceuticals. The SGX project team worked with CFFT to transfer the key assets from the collaboration to CFFT in order to enable the CF research community in future work. One major asset category was the extensive knowledge and material generated by SGX in the protein expression, purification, and crystallization experiments. Essentially all CFTR subdomain clones that generated soluble protein in the E. coli expression system used at SGX have been deposited at the Harvard Institute of Proteomics. Related information on the design, expression results and purification methods for these plasmids as well as for plasmids that did not produce soluble protein has been deposited in PepcDB. This document is intended to serve as a guide to those investigators who wish to access either the plasmids or the information. Information related to the crystallography data and the NBD1 small molecule ligands will be provided in separate documentation.*

*On behalf of the CF research community, Cystic Fibrosis Foundation Therapeutics wishes to acknowledge the hard work and dedication of the SGX CFTR project team led by Spencer Emtage. In particular, we thank those individuals who contributed time and care to make this legacy collection available: Shane Atwell, Kris Conner, Annette North, J. Michael Sauder, and Xun Zhao.*

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**To obtain SGX CFTR Clones to Harvard Institute of Proteomics go to:**

[http://plasmid.med.harvard.edu/PLASMID/GetCollection.do?collectionName=Cystic%20fibrosis%20transmembrane%20conductance%20regulator%20\(CFTR\)%20collection%20\(expression%20clones\)](http://plasmid.med.harvard.edu/PLASMID/GetCollection.do?collectionName=Cystic%20fibrosis%20transmembrane%20conductance%20regulator%20(CFTR)%20collection%20(expression%20clones))

**If it requires cleavage by the ULP1 protease to obtain free NBD protein, the SUMO protease can be purchased from Invitrogen at -**

<http://products.invitrogen.com/ivgn/en/US/adirect/invitrogen?cmd=catProductDetail&productID=12588018>

**or via license from Cornell. Contact Cornell Center for Technology Enterprise and Commercialization (email: [ctecconnect@cornell.edu](mailto:ctecconnect@cornell.edu))**

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# Plasmid

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## CFTR clones

Search for PlasmID under the Harvard Institute of Proteomics, go to:

<http://plasmid.med.harvard.edu/PLASMID/SearchClone.jsp>

**TABLE 1**

Mapping from Harvard Institute of Proteomics that gives the correlation between HIP PlasmID clone numbers and SGX clone names.

SGX_clonename	PlasmID clone ID
2935a14ClT3p1	474250
2935a1BSt1b1	474322
2935a2BSt4b1	474330
2935a3BCt3b1	474282
2935a3BSt1b1	474245
2935a4BSt1b1	474253
2935a5BCt3b1	474290
2935a5BSt11b1	474260
2935a6BSt4b1	474267
2935b4BSt10b1	474306
2935b5BSt4b1	474314
2935c305ClT4p1	474297
2935c306ClT3p1	474305
2935c307ClT20p1	474313
2935c308ClT1p1	474321
2935c309ClT5p1	474329
2935c311ClT1p1	474292
2935c312ClT1p1	474300
2935c313ClT1p1	474308
2935c314ClT1p1	474316
2935c315ClT1ba1	474324
2935c316ClT1p1	474332
2935c317ClT1p1	474247
2935c318ClT1p1	474255
2935c319ClT1p1	474262
2935c320ClT1p1	474269
2935c322ClT1p1	474277
2935c323ClT1p1	474285

2935c324Cl1p1	474293
2935c325Cl1p1	474301
2935c327Cl1p1	474309
2935c328Cl1p1	474317
2935c329Cl1p1	474325
2935c330Cl1p1	474333
2935c331Cl1p1	474248
2935c336Cl1p1	474326
2935c339Cl1p1	474334
2935c340Cl1p1	474249
2935c341Cl1p1	474256
2935c342Cl1p1	474263
2935c343Cl1p1	474271
2935c344Cl1p1	474279
2935c345Cl1p1	474287
2935c348Cl1p1	474295
2935c349Cl1ba1	473979
2935c349Cl1p1	474303
2935c353Cl1p1	474311
2935c354Cl1p1	474319
2935c369Cl1p1	474327
2935c371Cl1p1	474063
2935c375Cl1p1	474071
2935c376Cl1p1	474079
2935c382Cl1p1	474087
2935c383Cl1p1	474095
2935c388Cl1p1	474103
2935c389Cl1p1	474111
2935c390Cl1p1	474119
2935c391Cl1p1	474127
2935c392Cl1p1	474135
2935c393Cl1p1	474143
2935c394Cl1p1	474056
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2935c396Cl1p1	474072
2935c397Cl1p1	474080
2935c398Cl1p1	474088
2935c399Cl1p1	474096
2935c404Cl1p1	474136
2935c406Cl1p1	474057
2935c412Cl1p1	474065
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2935c414Cl1p1	474081
2935c415Cl1p1	474089
2935c416Cl1p1	474097
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2935c424BSt1p1	474182
2935c425BSt2p1	474198
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2935c434BSt2p1	474158
2935c435BSt1p1	474221

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2935c443BSt1p1	474206
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2935c469BSt1p1	474125
2935c471BSt2p1	474133
2935c472BSt1p2	474239
2935c476BSt3p1	474215
2935c481BSt1p1	474183
2935c482BSt1p1	474191
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2935c492BSt1p1	474223
2935c495BSt1p1	474207
2935c496BSt1p1	474231
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2935c507BSt1p1	474168
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2935c510BSt1p1	474176
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2935c551BSt4p1	474031
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2935c553KFg2h2	473956
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2935c605BSt1p1	474171
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2935f146ClT1p3	474296
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5762c37KFg2h2	473960
5762c38KFg2h2	473955
5762c40KFg2h1	473963
5762c41KWg2h1	473961
5762c43BSt1pi1	474233
5762c47BSt1pi1	474042

5762c48BSt1pi1	474049
5762c51BSt1pi1	474014
5762c52BSt1pi1	473976
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5762c7BSt1pi1	474053
5767b2BSt1p1	473981
5767k17BSt1p1	473974
5767k4BSt3b1	474307
5767k5BSt2b1	474315
5767k7BSt6b1	474299
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5811f5BSt6p1	474243
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5832c37ClT1pi1	474278
5832c392BSt1pi1	474146
5832c393BSt1pi1	474060
5832c396BSt1pi1	474076



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5832c44CLt1pi1	474286
5832c452BSt1pi1	474120
5832c456BSt1pi1	474128
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5832c45CLt1bb1	474294
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5832c505BSt1pi1	474137
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5832c581BSt1pi1	474175
5832c583BSt1pi1	474141
5832c584BSt1pi1	474102
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5832c588BSt1pi1	474062
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5832c600BSt1pi1	474208
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5832c613BSt1pi1	474224
5832c617BSt1pi1	474232
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5832c619BSt1pi1	474153
5832c625BSt1pi1	474164

5832c627BSt1pi1	474180
5832c628BSt1pi1	474188
5832c630BSt1pi1	474196
5832c631BSt1pi1	474204
5832c632BSt1pi1	474212
5832c633BSt1pi1	474220
5832c634BSt1pi1	474228
5832c635BSt1pi1	474236
5832c636BSt1pi1	474149
5832c637BSt1pi1	474157
5832c641BSt1pi1	474165
5832c643BSt1p1	473994
5832c643BSt1pi1	474177
5832c647BSt1p1	474002
5832c647BSt1pi1	474185
5832c651BSt1pi1	473977
5832c652BSt1pi1	473984
5832c653BSt2pi1	474044
5832c654BSt1pi1	474000
5832c655BSt1pi1	474051
5832c656BSt1pi1	473970
5832c657BSt1pi1	473992
5832c658BSt1pi1	474008
5832c660BSt1pi1	474209
5832c663BSt1pi1	474024
5832c667Kfg2h1	473958
5832c668KWg2h1	473957
5832c669BSt1pi1	474217
5832c670BSt1pi1	474016
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5832c678Kfg2h1	473965
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5832c697BSt1pi1	474005
5832c700BSt5pi1	474035
5832c701BSt1pi1	473968
5832c703BSt5pi1	474032
5832c705BSt3pi1	474039
5832c709BSt1pi1	473975
5832c711BSt1pi1	473982
5832c719BSt1pi1	473990
5832c724BSt1pi1	473998
5832c725BSt1pi1	474006
5832c726BSt1pi1	474022
5832c727BSt1pi1	474036
5832c728BSt1pi1	474043
5832c731BSt1pi1	474050

5832c732BSt1pi1	473969
5832c734BSt1pi1	474029
5832c737BSt1pi1	473987
5832c738BSt1pi1	473995
5832c739BSt1pi1	474003
5832c740BSt1pi1	474011
5832c741BSt1pi1	474019
5832f41CLt1p1	474259
5832f4CLt1p1	474244
5832f5CLt1p1	474252
5833b1BSt1pi1	474015
5833b2BSt1p1	474054
5833b2BSt1pi1	474023
5833b3BSt1pi1	474242
5833b4BSt1pi1	474155
5833b5BSt1pi1	474211
5833b6BSt1pi1	474187
5833b9BSt1pi1	474219
5833c10BSt1pi1	474105
5833c35BSt1pi1	474113
5833c38BSt1pi1	474082
5833c39BSt1pi1	474090
5833c40BSt1pi1	474098
5833c41BSt1pi1	474106
5833c42BSt1pi1	474114
5833c43BSt1pi1	474122
5833c44BSt1pi1	474130
5833c45BSt1pi1	474138
5833c46BSt1pi1	474059
5833c47BSt1pi1	474067
5833c48BSt1pi1	474077
5833c49BSt1pi1	474085
5833c50BSt1pi1	474093
5833c51BSt1pi1	474101
5833c52BSt1pi1	474109
5833c53BSt1pi1	474148
5833c6BSt1pi1	474147
5833f2BSt1pi1	474030
5921f1CLt1p1	474251

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# Protein expression purification and crystallization DataBase (PepcDB)

SGX experimental data on CFTR work has been uploaded to the PepcDB database.

<http://pepcdb.pdb.org/>

Note: To get the list of the DNA sequences of the clones and the sequences of the purified proteins, as well as provide the residue boundaries and mutations, enter the project target ID\* in the "Target ID" box and click Submit. On the search results page, click "(view all trials)". There are links to experimental data and protocols for cloning, expression, growth, purification, crystallization, etc., for each cloning or purification or crystallization attempt.

Or

Under the Trial Information section, Select "in PDB" as the Current Status, and enter Target ID, then you'll get a much more manageable list of results.

\*Target ID = all or part of the "clone name" in Table 2 (e.g. 2935 c or 2935c305 or 2935c305CLt4p1)

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**TABLE 2**

<b>Construct information for SGX constructs shipped to Harvard Institute of Proteomics (HIP) on 9/15/08</b>				
<b>Clone name</b>	<b>Termini and Mutations</b>	<b>Protein yield (mg/L)</b>	<b>Structure</b>	<b>Comments</b>
	Mutations marked with * are naturally occurring isotypes; (M): sequence info is manually annotated; (A): sequence info is automatically annotated by SGX LIMS.			
<b>Human NBD1</b>				
2935c305CLt4p1	389-673[F508A](M)	6.7		
2935c306CLt3p1	389-673[F409L, F433L](M)	0.9		
2935c307CLt20p1	389-673[F429S, H667R](M)	2.8		
2935c308CLt1p1	389-673[F409L, F429S, F433L, H667R](M)	3.3		
2935c309CLt5p1	389-673[A534S, L581T, L636K](M)	0.2		
2935c311CLt1p1	389-673[F409L, F433L, F508A](M)	8.3		
2935c312CLt1p1	389-673[F429S, F508A, H667R](M)	16.0		
2935c313CLt1p1	389-673[F409L, F429S, F433L, F508A, H667R](M)	23.3		
2935c314CLt1p1	389-673[F508A, A534S, L581T, L636K](M)	4.3		
2935c315CLt1ba1	389-678[N620H*](A)	1.8		
2935c316CLt1p1	389-678[del508](M)	#N/A		
2935c317CLt1p1	389-678[F409L, F433L](M)	2.2		
2935c318CLt1p1	389-678[F429S, H667R](M)	6.7		

2935c319CLt1p1	389-678[F409L, F429S, F433L, H667R](M)	10.0		
2935c320CLt1p1	389-678[A534S, L581T, L636K](M)	3.3		
2935c322CLt1p1	389-678[F409L, F433L, F508A](M)	1.8		
2935c323CLt1p1	389-678[F429S, F508A, H667R](M)	8.8	S413(1XMI)	
2935c324CLt1p1	389-678[F409L, F429S, F433L, F508A, H667R](M)	8.0		
2935c325CLt1p1	389-678[F508A, A534S, L581T, L636K](M)	3.9		
2935c327CLt1p1	389-678[F409L, F429S, F433L, G550E, R553Q, R555K, H667R](M)	35.6	S587(2BBO)	
2935c328CLt1p1	389-678[F409L, F429S, F433L, del508, G550E, R553Q, R555K, H667R](M)	21.0	S416(1XMJ)	
2935c329CLt1p1	389-678[V393E, F409L, F429S, F433L, F494N, Q637R, H667R](M)	35.5		
2935c330CLt1p1	389-678[V393E, F409L, F429S, F433L, F494N, del508, Q637R, H667R](M)	48.6		
2935c331CLt1p1	389-678[F400S, F409L, F429S, F433L, L436H, H667R](M)	4.8		
2935c336CLt1p1	389-678[V393E, F400S, F409L, F429S, F433L, L436H, F494N, del508, Q637R, H667R](M)	38.9		
2935c339CLt1p1	389-678[F508A, H667R](M)	12.5		
2935c340CLt1p1	389-678[F429S, F508A](M)	27.5		
2935c341CLt1p1	389-678[V393E, F409L, F429S, F433L, del508, H667R](M)	0.2		
2935c342CLt1p1	389-678[F409L, F429S, F433L, F494N, del508, H667R](M)	1.6		
2935c343CLt1p1	389-678[F409L, F429S, F433L, del508, Q637R, H667R](M)	1.9		
2935c344CLt1p1	389-678[F409L, F429S, F433L, del508, G550E, H667R](M)	2.7		
2935c345CLt1p1		2.8		
2935c348CLt1p1	389-678[F409L, F429S, F433L, del508, R555K, H667R](M)	6.9		

2935c349CLt1ba1	389-678[F429S, N620H*](A)	1.5		
2935c349CLt1p1	389-678[F429S](M)	4.3		
2935c353CLt1p1	389-678[F429S, del508, R555K](M)	5.1		
2935c354CLt1p1	389-678[del508, R555K](M)	0.8		
2935c369CLt1p1	389-678[F429S, F494N, del508](M)	0.9		
2935c371CLt1p1	389-678[F429S, F494N, del508, Q637R](M)	1.0	S579(2BBS)	
2935c375CLt1p1	389-678[F494N, del508, Q637R](M)	2.0	S621(2BBT)	
2935c376CLt1p1	389-678[F494N, Q637R](M)	5.0		
2935c382CLt1p1	389-678[F429S, F494N, Q637R](M)	20.0		
2935c383CLt1p1	389-678[F409L, F429S, F433L, Q637R, H667R](M)	17.2		
2935c388CLt1p1	389-678[F429S, T438E, F494N, del508, Q637R](M)	3.2		
2935c389CLt1p1	389-678[F429S, T460R, F494N, del508, Q637R](M)	7.5		
2935c390CLt1p1	389-678[F429S, F494N, del508, V510R, Q637R](M)	7.0		
2935c391CLt1p1	389-678[F429S, F494N, del508, E632R, Q637R](M)	0.4		
2935c392CLt1p1	389-678[F429S, F494N, del508, N620H*, L636E, Q637R](A)	5.0	Multiple internal structures complexed with FAST ligands	Construct used for FAST crystal soaking
2935c393CLt1p1	389-678[F429S, F494N, del508, Q637R, D639E](M)	7.0		
2935c394CLt1p1	389-678[T438E, F494N, del508, Q637R](M)	0.2		
2935c395CLt1p1	389-678[T460R, F494N, del508, Q637R](M)	4.3		
2935c396CLt1p1	389-678[F494N, del508, V510R, Q637R](M)	#N/A		
2935c397CLt1p1	389-678[F494N, del508, E632R, Q637R](M)	0.3		

2935c398CLt1p1	389-678[F494N, del508, L636E, Q637R](M)	3.0		
2935c399CLt1p1	389-678[F494N, del508, Q637R, D639E](M)	0.8		
2935c404CLt1p1	389-678[F429S, F494N, N620H*, L636E, Q637R](A)	14.0		
2935c406CLt1p1	389-678[del405-434, F494N, N620H*, Q637R](A)	19.3		
2935c412CLt1p1	389-646[del405-434, F494N, N620H*, Q637R](A)	20.3		
2935c413CLt1p1	389-648[del405-434, F494N, N620H*, Q637R](A)	10.5		
2935c414CLt1p1	389-652[del405-434, F494N, N620H*, Q637R](A)	27.5		
2935c415CLt1p1	389-678[F429S, F494N, del508, N620H*, L636E, Q637R, 678] + SNAP tag(M)	0.8		
2935c416CLt1p1	389-678[F429S, F494N, N620H*, L636E, Q637R, 678] + SNAP tag (M)	9.6		
2935c420BSt1p1	387-646[del405-436, F494N, Q637R](M)	28.0		
2935c421BSt2p1	388-646[387ins20, del405-436, F494N, Q637R](M)	8.0		CL4 1057-1072 (TSLKGIWTLRAFGRQP) fusion at the N-terminus with (SGGG)1 linker
2935c424BSt1p1	388-646[387ins36, del405-436, F494N, Q637R](M)	20.0		CL4 1057-1072 fusion at the N-terminus with (SGGG)5 linker
2935c425BSt2p1	388-646[387ins25, del405-436, F494N, Q637R](M)	10.7		CL4 1056-1076 (VTSLKGIW TLRAFGRQPY FET) fusion at the N-terminus with (SGGG)1 linker
2935c433BSt2p1	388-646[387ins20, del405-436](M)	1.5		CL4 1057-1072 fusion at the N-terminus with (SGGG)1 linker
2935c434BSt2p1	388-646[387ins28, del405-436](M)	7.3		CL4 1057-1072 fusion at the N-terminus with (SGGG)3 linker
2935c435BSt1p1	388-646[388ins32, del405-436, N620H*](M)	9.3		CL4 1057-1072 fusion at the N-terminus with (SGGG)4 linker
2935c436BSt2p1	388-646[387ins36, del405-436](M)	2.8		CL4 1057-1072 fusion at the N-terminus with (SGGG)5 linker



2935c438BSt1p1	388-646[387ins33, del405-436](M)	2.6		CL4 1056-1076 fusion at the N-terminus with (SGGG)3 linker
2935c440BSt1p1	388-646[del405-436](M)	2.7		CL4 1056-1076 fusion at the N-terminus with (SGGG)5 linker
2935c441BSt2p1	384-646[383ins25, del405-436](M)	1.2		CL4 1056-1076 fusion at the N-terminus with (SGGG)1 linker
2935c442BSt2p1	384-646[393ins33, del405-436](M)	2.0		CL4 1056-1076 fusion at the N-terminus with (SGGG)3 linker
2935c443BSt1p1	384-646[383ins37, del405-436](M)	0.6		CL4 1056-1076 fusion at the N-terminus with (SGGG)4 linker
2935c444BSt2p1	384-646[383ins41, del405-436](M)	1.5		CL4 1056-1076 fusion at the N-terminus with (SGGG)5 linker
2935c447BSt2p1	388-646[387ins32, del405-434](M)	7.7		CL4 1057-1072 fusion at the N-terminus with (SGGG)4 linker
2935c469BSt1p1	387-646[del405-436](M)	12.0	S1211(2PZE)	WT NBD1 without RI
2935c471BSt2p1	387-646[F409L, F429S, F433L](M)	6.0		
2935c472BSt1p2	387-646[del405-436, del508](M)	7.0	S1278(2PZF), S1244	
2935c476BSt3p1	376-646[375ins13, del405-436](M)	1.7		CL4 1058-1069 fusion at the N-terminus without linker
2935c481BSt1p1	387-645[del405-436](M)	4.7		
2935c482BSt1p1	388-644[del404-435, L436G, N620H*, D639V](A)	17.0		
2935c486BSt1p1	387-640[del405-436](M)	11.0		
2935c492BSt1p1	375-646[del405-436](M)	15.0	S1260(2PZQ)	
2935c495BSt1p1	384-646[del404-435, L436G, N620H*](A)	10.0		
2935c496BSt1p1	390-646[del404-435, L436G, N620H*](A)	12.7		
2935c499BSt1p1	387-646(A)	0.6		WT NBD1 with RI
2935c502BSt1p1	388-646[387ins38, del405-436](M)	13.3		CL1 162-181(KKTLKLSS RVIDKISIGQLV) fusion at the N-terminus with (SGGG)4 linker
2935c507BSt1p1	388-646[387ins40, del405-436](M)	14.0		CL2 262-283 (TSEMIENI QSVKAYCWEE AMEK) fusion at the N-terminus with (SGGG)4 linker

2935c508BSt1p1	388-646[C276S, 387ins40, del405-436](M)	22.7		CL2 262-283 (TSEMIENIQSVKAYSWE E AMEK) fusion at the N-terminus with C276S and (SGGG) <sub>4</sub> linker
2935c510BSt1p1	388-646[387ins39, del405-436](M)	10.3		CL3 954-974 (HSV LQAPMSTLNTLKAGGILN) fusion at the N-terminus and (SGGG) <sub>4</sub> linker
2935c516BSt1p1	387-646[del405-436, G576C, Y577H](M)	12.7	S1293	
2935c529BSt1p1	388-646[del405-436, C491S, C524L, C590L, C592V](M)	5.0		
2935c530BSt1p1	388-646[del405-436, C491S, C524S, C590L, C592L](M)	0.9		
2935c531BSt1p1	388-646[del405-436, C491S, C592V](M)	4.5	S1481	
2935c536BSt1p1	388-646[del405-436, G576C](M)	6.0		
2935c537BSt1p1	388-646[del405-436, Y577H](M)	11.0	S1321	
2935c538BSt1p1	388-646[388ins32, del405-436, G576C, Y577H, N620H*](M)	7.5		CL4 1057-1072 fusion at the N- terminus with (SGGG) <sub>4</sub> linker
2935c543BSt1p1	388-646[S1A, 388ins32, del405-436, G576C, Y577H, N620H*](M)	6.3		CL4 1057-1072 fusion at the N- terminus with (SGGG) <sub>4</sub> linker
2935c544BSt1p1	388-646[S1A, 388ins32, del405-436, G576C, Y577H, N620H*, T1064E](M)	8.5		Phosphomimetic mutation T1064E; CL4 1057-1072 fusion at the N-terminus with (SGGG) <sub>4</sub> linker
2935c545BSt1p1	388-646[S1A, 388ins32, del405-436, G576C, Y577H, N620H*, S1058E](M)	11.0		Phosphomimetic mutation S1058E; CL4 1057-1072 fusion at the N-terminus with (SGGG) <sub>4</sub> linker
2935c546BSt1p1	388-646[388ins36, del405-436, G576C, Y577H, N620H*, S1058E](M)	1.8		Phosphomimetic mutation S1058E; CL4 1056-1072 fusion at the N-terminus with (SGGG) <sub>4</sub> linker
2935c548BSt1p1	388-630[del405-436, N620H*, 630ins153](M)	10.5		MalK dimerization domain (219-371) fusion at C-terminus
2935c549BSt1p1	388-630[del405-436, N620H*, 630ins153](M)	1.9		MalK dimerization domain (219-371) with F229A/V230G fusion at C- terminus
2935c550BSt1p1	387-646[del405-436, C491S, G576C, C592V, N620H*](M)	6.0		

2935c551BSt4p1	388-646[del405-436, C491S, G576C, Y577H, C592V, N620H*](M)	9.0		
2935c552KWg2h2	388-646[388ins31, del405-436, N620H*](M)	1.8		Baculo clone with noncleavable C-His tag; CL4 1056-1072 fusion at the N-terminus with (SGGG) <sub>4</sub> linker
2935c553KFg2h2	388-646[388ins31, del405-436, N620H*](M)	1.3		Baculo clone with tev cleavable N-His tag; CL4 1056-1072 fusion at the N-terminus with (SGGG) <sub>4</sub> linker
2935c555BSt1p1	388-646[S1A, 388ins32, del405-436, G576C, Y577H, N620H*, S1058E, T1064E](M)	7.0		Phosphomimetic mutation S1058E/S1064E;CL4 1057-1072 fusion at the N-terminus with (SGGG) <sub>4</sub> linker
2935c557BSt1p1	388-646[del405-436, S511E, G576C, Y577H, N620H*](M)	13.0		Phosphomimetic mutation S511E
2935c558BSt2p1	388-646[del405-436, S605E, N620H*](M)	8.5		Phosphomimetic mutation S605E on NBD1/NBD2 interface
2935c559BSt2p1	388-646[del405-436, Y577E, N620H*](M)	6.5		Phosphomimetic mutation Y577E on NBD1/NBD2 interface
2935c560BSt2p1	388-646[S1A, 388ins32, del405-436, S511E, G576C, Y577H, N620H*, S1058E, T1064E](M)	15.0		Phosphomimetic mutation S511E/S1058E/T1064E;CL4 1057-1072 fusion at the N-terminus with (SGGG) <sub>4</sub> linker
2935c565BSt1p1	388-646[del405-436, S557E, G576C, Y577H, N620H*](M)	25.0		
2935c566BSt1p1	388-646[del405-436, S492E, G576C, Y577H, N620H*](M)	27.0		
2935c567BSt1p1	388-646[del405-436, S495E, G576C, Y577H, N620H*](M)	18.0		
2935c569BSt1p1	388-646[388ins32, del405-436, G576C, Y577H, N620H*, T1057E](M)	10.0		CL4 1057-1072 fusion at the N-terminus with (SGGG) <sub>4</sub> linker;phosphomimetic mutantion T1057E
2935c570BSt1p1	388-646[388ins32, del405-436, G576C, Y577H, N620H*, T1057D](M)	12.5		CL4 1057-1072 fusion at the N-terminus with (SGGG) <sub>4</sub> linker;phosphomimetic mutantion T1057D

2935c572BSt3p1	388-646[388ins32, del405-436, V510A, G576C, Y577H, N620H*](M)	8.5		CL4 1057-1072 fusion at the N-terminus with (SGGG)4 linker; test V510A
2935c573BSt1p1	388-646[388ins32, del405-436, V510D, G576C, Y577H, N620H*](M)	23.0		CL4 1057-1072 fusion at the N-terminus with (SGGG)4 linker; test V510D
2935c574BSt2p1	388-646[388ins32, del405-436, G576C, Y577H, N620H*, L1059R, L1062D](M)	10.0		CL4 1057-1072 fusion at the N-terminus with (SGGG)4 linker; solubilizing mutations L1059R/L1062D
2935c577BSt1p1	387-646[del405-436, V510D, N620H*](M)	36.5		
2935c586BSt1p1	388-634[del405-436, N620H*, 634ins17](M)	1.5		CL4 1060-1076 fusion at C-terminus, no linker
2935c587BSt1p1	388-634[del405-436, G576C, Y577H, N620H*, 634ins17](M)	1.0		CL4 1060-1076 fusion at C-terminus, no linker
2935c589BSt1p1	388-646[388ins30, del405-436, G576C, Y577H, N620H*](M)	7.0		CL4 1063-1076 fusion at the N-terminus with (SGGG)4 linker
2935c590BSt2p1	388-646[del404-436, C491S, V510D, C524L, Y577H, C590L, C592V](M)	14.0		
2935c591BSt1p1	384-646[384ins33, del405-436, G576C, Y577H, N620H*](M)	2.5		CL4 1056-1076 fusion at the N-terminus with (SGGG)3 linker
2935c593BSt1p1	388-646[388ins36, del405-436, G576C, Y577H, N620H*](M)	8.5		CL1 162-181(KKTLKLSS RVIDKISIGQLV) fusion at the N-terminus with (SGGG)4 linker
2935c595BSt1p1	388-646[388ins38, del405-436, G576C, Y577H, N620H*](M)	13.5		CL2 262-283 (TSEMIENIQSVKAYSWEE AMEK) fusion at the N-terminus with C276S and (SGGG)4 linker
2935c597BSt1p1	388-646[del405-436, C491M, C592V, N620H*](M)	6.5		
2935c598BSt1p1	388-646[del405-436, C491L, C592V, N620H*](M)	9.5		
2935c599BSt1p1	387-646[del405-436, C491S, C524L, C590A, C592V, N620H*](M)	4.0		

2935c600BSt1p1	387-646[del405-436, C491S, C524L, C590A, C592L, N620H*](M)	6.5		
2935c601BSt1p1	388-646[del405-436, C491S, C524M, C590A, C592V, N620H*](M)	0.4		
2935c602BSt1p1	387-646[del405-436, C491S, C524M, C590A, C592L, N620H*](M)	6.4		
2935c603BSt1p1	387-646[del405-436, S573Q](M)	12.5		NBD1 WalkerB mutant
2935c604BSt1p1	387-646[del405-436, S573E, N620H*](M)	15.0		NBD1 WalkerB mutant
2935c605BSt1p1	388-646[388ins32, del405-436, S557E, G576C, Y577H, N620H*](M)	5.5		Phosphomimetic mutant, CL4 1057-1072 fusion at the N-terminus with (SGGG) <sub>4</sub> linker
2935c609BSt1p1	388-634[del405-436, V510D, N620H*, 634ins17](M)	7.5		CL4 1060-1076 fusion at C-terminus, no linker
2935c610BSt1p1	388-630[del405-436, N620H*, 630ins153](M)	2.5		MalK dimerization domain (219-371) with R351D fusion at C-terminus
2935c615BSt1p1	388-646[del405-436, F494N, del508, N620H*, Q637R](M)	15.5		
2935c616BSt1p1	388-646[del405-436, G550E](M)	#N/A		
2935c617BSt1p1	388-646[del405-436, I539T](M)	#N/A		
2935c618BSt1p1	388-646[del405-436, R516K](M)	#N/A		
2935c619BSt1p1	388-646[del405-436, del508, G550E](M)	#N/A		
2935c620BSt1p1	388-646[del405-436, del508, I539T](M)	#N/A		
2935c621BSt1p1	388-646[del405-436, del508, R516K](M)	#N/A		
2935c622BSt1p1	388-646[del405-436, del508, V510D](M)	10.0		
2935c623BSt1p1	388-646[del405-436, R516K, R555K](M)	#N/A		
2935c624BSt1p1	388-646[del405-436, del508, R516K, R555K](M)	#N/A		
2935c625BSt1p1	388-646[del405-436, G550E, R553Q, R555K, N620H*](M)	24.0		
2935c626BSt1p1	388-646[del405-436, del508, G550E, R553Q, R555K, N620H*](M)	21.0		
2935c97BCt5b1	383-678(A)	#N/A		
5784c11CLt3p1	389-674[F508A, N620H*, F669L](M)	2.2		
5784c2BCt3p1	389-678[F508A, N620H*](M)	0.1		

<b>Mouse NBD1</b>				
2935f133CLt7p1	389-673[Q410E*, A412V*, L462S*, E583G, T623S*, S639D*](A)	4.6		
2935f146CLt1p3	389-673[Q410E*, A412V*, L462S*, T623S*, S639D*](A)	7.2	S147(1Q3H), S182(1R0W), S183(1R0X), I201,S204(1R0Z), S205(1R0Y)	
2935f147CLt1p1	389-673[Q410E*, A412V*, C434S, L462S*, E583G, T623S*, S639D*](A)	4.5		
2935f152CLt1p1	389-673[Q410E*, A412V*, L462S*, K464A, T623S*, S639D*](A)	0.9		
2935f153CCt2p1	387-673[387ins1, Q410E*, A412V*, L462S*, T623S*, S639D*](M)	#N/A		
2935f42TCt1p1	388-673[Q410E*, A412V*, L462S*, E583G, T623S*, S639D*](A)	6.2		
5784f2BCt2p1	388-673[Q410E*, A412V*, L462S*, del508, E583G, T623S*](M)	#N/A		
5784f3BCt2p1	388-673[F408G, Q410E*, A412V*, L462S*, E583G, T623S*](M)	#N/A		
5784f4BCt1p1	388-673[Q410E*, A412V*, L462S*, F508R, E583G, T623S*](M)	#N/A		
5784f5BCt1p1	388-673[F408Y, Q410E*, A412V*, L462S*, E583G, T623S*](M)	#N/A		
5784f7BSt3p1	1-285[Q22E*, A24V*, L74S*, F120A, E195G, T235S*, S251D*](A)	2.4		actual domain boundary is 388-673, with F508A
5784f8BSt6p1	1-285[Q22E*, A24V*, L74S*, F120G, E195G, T235S*, S251D*](A)	5.0		actual domain boundary is 388-673, with F508G
5811f26BSt3p1	393-670[Q410E*, A412V*, L462S*, E583G, T623S*, S639D*](A)	1.7		
5811f29BSt2p1	388-673[Q410E*, A412V*, L462S*, E583G, T623S*, S639D*](A)	1.0		
5811f36BSt2p1	386-673[Q410E*, A412V*, L462S*, E583G, T623S*, S639D*](A)	0.7		

5811f5BSt6p1	384-670[Q410E*, A412V*, L462S*, E583G, T623S*, S639D*](A)	2.7		
5831f17CLt4p1	389-702[Q410E*, A412V*, L462S*, T623S*, S639D*](A)	4.0		NBD1-R
5831f18CLt5p1	389-688[Q410E*, A412V*, L462S*, T623S*, S639D*](A)	8.0		NBD1-R
5831f19CLt4p1	389-679[Q410E*, A412V*, L462S*, T623S*, S639D*](A)	#N/A		NBD1-R
5921f1CLt1p1	123-407(A)	2.8		delta508 version of 2935f146CLt1p3, actual domain boundary is 389-673
<b>Salmon NBD1</b>				
2935a14CLt3p1	417-663[M541T](A)	#N/A		
2935a1BSt1b1	384-678(A)	7.0		
2935a28CCt2p1	388-672(A)	#N/A		
2935a2BSt4b1	384-669(A)	11.7		
2935a3BCt3b1	390-678(A)	#N/A		
2935a3BSt1b1	390-678(A)	7.7		
2935a4BSt1b1	390-669(A)	16.5		
2935a5BCt3b1	392-678(A)	0.1		
2935a5BSt11b1	392-678(A)	2.8		
2935a6BSt4b1	392-669(A)	7.2		
5806a100BSt9p1	391-678(A)	#N/A		
5806a28BSt7p1	392-678(A)	#N/A		
5806a33BSt4p1	417-662(A)	#N/A		
5806a37BSt2p1	394-678(A)	#N/A		
5806a39BSt2p1	394-662(A)	9.0		
<b>Dogfish NBD1</b>				
5767k17BSt1p1	389-647[del406-437, V438G](M)	89.0		dogfish NBD1 without RI, V to G was to make human-like
5767k4BSt3b1	392-671(A)	5.0		
5767k5BSt2b1	392-682(A)	11.5		
5767k7BSt6b1	390-682(A)	0.3		

<b>Frog NBD1</b>				
2935j83BSt3b1	383-674(A)	0.3		
<b>Killifish NBD1</b>				
2935b4BSt10b1	389-669(A)	1.7		
2935b5BSt4b1	392-678(A)	0.3		
<b>Mummichog NBD1</b>				
5767b2BSt1p1	389-645[del406-435, V436G](M)	65.0		mummichog NBD1 without RI, V to G was to make human-like
<b>Sheep NBD1</b>				
2935g33BSt1pd1	1202-1436(A)	#N/A		
2935g3BSt5b1	389-677(A)	0.4		
2935g4BSt5b1	389-669(A)	0.5		
<b>Human NBD2</b>				
5832c243BSt1ba1	1200-1444(A)	0.3		Chaperone co-expression cells; detergents required for purification
5832c286BSt1pd1	1165-1480(A)	0.3		Chaperone co-expression cells; detergents required for purification
5832c286BSt1pi1	1165-1480(A)	3.8		Chaperone co-expression cells; detergents required for purification
5832c337CLt1pi1	1201-1446(A)	3.3		Chaperone co-expression cells; detergents required for purification
5832c343CLt1pd1	1201-1446[L1408K](A)	0.1		Chaperone co-expression cells; detergents required for purification
5832c343CLt1pi1	1201-1446[L1408K](A)	0.3		Chaperone co-expression cells; detergents required for purification
5832c352BSt1pi1	1187-1468(A)	5.0		Chaperone co-expression cells; detergents required for purification
5832c365BSt1pi1	1191-1457(A)	6.5		Chaperone co-expression cells; detergents required for purification



5832c365BSt1pk1	1191-1457(A)	1.9		Chaperone co-expression cells; detergents required for purification
5832c369BSt1pi1	1193-1480(A)	7.5		Chaperone co-expression cells; detergents required for purification
5832c37CLt1pi1	1201-1435(A)	4.2		Chaperone co-expression cells; detergents required for purification
5832c392BSt1pi1	1191-1457[E1371Q](A)	1.4		Chaperone co-expression cells; detergents required for purification
5832c393BSt1pi1	1191-1461[E1371Q](A)	2.8		Chaperone co-expression cells; detergents required for purification
5832c396BSt1pi1	1193-1480[E1371Q](A)	4.0		Chaperone co-expression cells; detergents required for purification
5832c401BSt1pi1	1193-1455[E1371Q](A)	4.5		Chaperone co-expression cells; detergents required for purification
5832c44CLt1pi1	1201-1435[E1371Q](A)	4.8		Chaperone co-expression cells; detergents required for purification
5832c452BSt1pi1	1191-1457[1457ins8](M)	0.7		Chaperone co-expression cells; detergents required for purification
5832c456BSt1pi1	1193-1480[E1371Q](M)	1.2		Chaperone co-expression cells; detergents required for purification
5832c45CLt1ba1	1201-1446[E1371Q](A)	0.9		Chaperone co-expression cells; detergents required for purification
5832c45CLt1bb1	1201-1446[E1371Q](A)	1.8		Chaperone co-expression cells; detergents required for purification
5832c474BSt1pi1	1193-1480[I1203N, Q1268E, S1276D, F1296S, E1371Q, Q1390E, Q1411D](A)	0.5		
5832c483BSt1pi1	1193-1445[S1276D, E1371Q, Q1428E, F1437S](A)	0.6		
5832c484BSt1pi1	1193-1445[Q1238E, S1276D, Q1309E, E1371Q, Q1428E, F1437S](A)	0.7		
5832c485BSt1pi1	1193-1445[I1203N, Q1268E, S1276D, F1296S, E1371Q, Q1390E, Q1411D](A)	1.9		
5832c486BSt1pi1	1193-1445[L1261N, W1310H, E1371Q, I1383D, Y1424D, S1444C](M)	0.4		

5832c487BSt1pi1	1193-1445[L1261N, E1371Q, I1383D, F1437S](A)	0.2		
5832c488BSt1pi1	1193-1445[N1224D, V1272D, F1296S, Q1313E, V1340E, E1371Q, Q1390E, S1426E](A)	0.5		
5832c497BSt1pi1	1201-1445[Q1268E, S1276D, F1296S, E1371Q, Q1390E, Q1411D](A)	0.8		
5832c4CLt1pi1	1170-1463(A)	3.3		
5832c503BSt1pi1	1193-1445[I1203N, Q1268E, S1276D, F1296S, E1371Q, Q1390E](A)	0.8		
5832c504BSt1pi1	1193-1445[I1203N, Q1268E, S1276D, F1296S, E1371Q, Q1411D](A)	2.6		
5832c505BSt1pi1	1193-1445[I1203N, Q1268E, S1276D, E1371Q, Q1390E, Q1411D](A)	2.0		
5832c506BSt1pi1	1193-1445[I1203N, Q1268E, F1296S, E1371Q, Q1390E, Q1411D](A)	3.8		
5832c507BSt1pi1	1193-1445[I1203N, S1276D, F1296S, E1371Q, Q1390E, Q1411D](A)	4.5		
5832c508BSt1pi1	1193-1445[Q1268E, S1276D, F1296S, E1371Q, Q1390E, Q1411D](A)	2.3		
5832c509BSt1pi1	1193-1445[I1203N, Q1268E, S1276D, F1296S, Q1390E, Q1411D](A)	5.5		
5832c510BSt1pi1	1201-1434[Q1268E, S1276D, F1296S, E1371Q, Q1390E, Q1411D](A)	0.5		
5832c512BSt1pi1	1193-1459[I1203N, Q1268E, S1276D, F1296S, E1371Q, Q1390E, Q1411D](A)	0.6		
5832c513BSt1pi1	1201-1445[Q1268E, S1276D, F1296S, Q1390E, Q1411D](A)	2.7		
5832c514BSt1pi1	1193-1445[I1203N, Q1268E, S1276D, F1296S, Q1411D](A)	1.8		
5832c515BSt1pi1	1193-1445[I1203N, Q1268E, S1276D, Q1390E, Q1411D](A)	6.3		
5832c516BSt1pi1	1193-1445[I1203N, Q1268E, F1296S, Q1390E, Q1411D](A)	3.8		

5832c517BSt1pi1	1193-1445[I1203N, S1276D, F1296S, Q1390E, Q1411D](A)	10.3		
5832c518BSt1pi1	1193-1445[Q1268E, S1276D, F1296S, Q1390E, Q1411D](A)	5.1		
5832c553BSt1pi1	1193-1445[Q1280E](A)	0.5		
5832c557BSt1pi1	1193-1445[Q1382E, L1436D](A)	0.7		
5832c563BSt1pi1	1193-1445[Q1411D](A)	0.7		
5832c577BSt1pi1	1193-1445[I1203N, F1296S, Q1411D](A)	0.7		
5832c580BSt1pi1	1193-1445[Q1411D, L1436D](A)	2.5		
5832c581BSt1pi1	1193-1445[Q1280E, Q1411D, L1436D](A)	5.1		
5832c583BSt1pi1	1193-1445[I1203N, S1276D, F1296S, Q1390E, H1402A, Q1411D](A)	35.5		
5832c584BSt1pi1	1193-1445[Q1280E, H1402A, Q1411D, L1436D](A)	22.0		
5832c585BSt1pi1	1193-1445[H1402A, Q1411D, L1436D](A)	14.5		
5832c586BSt1pi1	1193-1445[I1203N, F1296S, H1402A, Q1411D](A)	13.5		
5832c587BSt1pi1	1193-1445[H1402A, Q1411D](A)	5.0		
5832c588BSt1pi1	1193-1445[Q1280E, H1402A](A)	2.0		
5832c589BSt1pi1	1193-1445[Q1382E, H1402A, L1436D](A)	10.0		
5832c592BSt1pi1	1193-1445[H1402A, L1436D](A)	3.9		
5832c597BSt1pi1	1182-1445[Q1280E, H1402A, Q1411D, L1436D](A)	0.9		
5832c600BSt1pi1	1194-1445[Q1280E, H1402A, Q1411D, L1436D](A)	8.0		
5832c612BSt1pi1	1193-1437[Q1280E, H1402A, Q1411D, L1436D](M)	17.0		
5832c613BSt1pi1	1193-1438[Q1280E, H1402A, Q1411D, L1436D](M)	30.0		
5832c617BSt1pi1	1193-1442[Q1280E, H1402A, Q1411D, L1436D](A)	17.0		

5832c618BSt1pi1	1193-1443[Q1280E, H1402A, Q1411D, L1436D](A)	15.0		
5832c619BSt1pi1	1193-1444[Q1280E, H1402A, Q1411D, L1436D](A)	15.0		
5832c625BSt1pi1	1193-1445[Q1280E, C1355S, C1395S, C1400S, H1402A, C1410S, Q1411D, L1436D](A)	0.9		
5832c627BSt1pi1	1193-1445[Q1280E, E1308A, Q1309A, H1402A, Q1411D, L1436D](A)	20.0		
5832c628BSt1pi1	1193-1445[Q1280E, K1363Y, K1365Y, H1402A, Q1411D, L1436D](A)	0.7		
5832c630BSt1pi1	1193-1445[Q1280E, H1402A, Q1411D, E1417Y, E1418Y, L1436D](A)	1.5		
5832c631BSt1pi1	1193-1445[Q1280E, H1402A, Q1411D, E1418T, K1420T, L1436D](A)	5.5		
5832c632BSt1pi1	1193-1445[Q1280E, F1296L, H1402A, Q1411D, L1436D](A)	15.0		
5832c633BSt1pi1	1193-1445[Q1280E, Y1307N, H1402A, Q1411D, L1436D](A)	30.0		
5832c634BSt1pi1	1193-1445[Q1280E, W1310H, H1402A, Q1411D, L1436D](A)	32.5		
5832c635BSt1pi1	1193-1445[Q1280E, W1316D, H1402A, Q1411D, L1436D](A)	3.9		
5832c636BSt1pi1	1193-1445[Q1280E, F1337A, H1402A, Q1411D, L1436D](A)	8.5		
5832c637BSt1pi1	1193-1445[Q1280E, A1374C, H1402A, Q1411D, L1436D](A)	13.5		
5832c641BSt1pi1	1193-1445[K1250A, Q1280E, H1402A, Q1411D, L1436D](A)	0.7		
5832c643BSt1p1	1193-1427[Q1280E, Q1411D, 1427ins153](M)	2.8		Non-chaperone cells;MalK dimerization domain (219-371) fusion at C-terminus
5832c643BSt1pi1	1193-1427[Q1280E, Q1411D, 1427ins153](M)	6.0		Chaperone coexpression cells;MalK dimerization domain (219-371) fusion at C-terminus

5832c647BSt1pi1	1193-1427[Q1280E, H1402A, Q1411D, 1427ins153](M)	10.0		Non-chaperone cells;Malk dimerization domain (219-371) fusion at C-terminus
5832c647BSt1pi1	1193-1427[Q1280E, H1402A, Q1411D, 1427ins153](M)	30.0		Chaperone coexpression cells;Malk dimerization domain (219-371) fusion at C-terminus
5832c651BSt1pi1	1200-1445[Q1280E, H1402A, Q1411D, L1436D](A)	11.0		
5832c652BSt1pi1	1201-1445[Q1280E, H1402A, Q1411D, L1436D](A)	9.5		
5832c653BSt2pi1	1195-1445[Q1280E, H1402A, Q1411D, L1436D](A)	12.0		
5832c654BSt1pi1	1196-1445[Q1280E, H1402A, Q1411D, L1436D](A)	11.0		
5832c655BSt1pi1	1197-1445[Q1280E, H1402A, Q1411D, L1436D](A)	19.0		
5832c656BSt1pi1	1198-1445[Q1280E, H1402A, Q1411D, L1436D](A)	20.0		
5832c657BSt1pi1	1202-1445[Q1280E, H1402A, Q1411D, L1436D](A)	12.5		
5832c658BSt1pi1	1203-1445[Q1280E, H1402A, Q1411D, L1436D](A)	10.0		
5832c660BSt1pi1	1193-1445[Q1280E, K1363R, K1365R, H1402A, Q1411D, L1436D](A)	9.0		
5832c663BSt1pi1	1193-1445[Q1280E, H1348G, H1350Q, H1402A, Q1411D, L1436D](A)	10.9		
5832c667KFg2h1	1193-1445[Q1280E, H1402A, Q1411D, L1436D](A)	7.3		Baculo construct with N-terminal, tev cleavable His tag
5832c668KWg2h1	1193-1445[Q1280E, H1402A, Q1411D, L1436D](A)	4.5		Baculo construct with C-terminal non-cleavable His tag
5832c669BSt1pi1	1193-1445[1ins38, Q1280E, H1402A, Q1411D, L1436D](M)	4.9		CL2 262-283 (TSEMIENI QSVKAYCWEE AMEK) fusion at the N-terminus with (SGGG) <sub>4</sub> linker
5832c670BSt1pi1	1193-1427[Q1280E, H1348G, H1350Q, H1402A, Q1411D](A)	10.0		Signature motif mutant with Malk dimerization domain (219-371) fusion at C-terminus

5832c671BSt1pi1	1193-1445[Q1280E, Y1307N, W1310H, H1402A, Q1411D, L1436D](A)	25.6		
5832c673KWg1h1	1193-1445[Q1280E, Q1411D, L1436D](A)	1.4		
5832c674KFg2h1	1193-1435[Q1280E, H1402A, Q1411D](A)	2.8		
5832c678KFg2h1	1198-1445[Q1280E, H1402A, Q1411D, L1436D](A)	5.3		
5832c684BSt1pi1	1193-1427[Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D, 1427ins153](M)	37.5	S1537	MalK dimerization domain (219-371) fusion at C-terminus
5832c690BSt1pi1	1193-1445[Q1280E, C1355S, C1395S, C1400S, H1402A, Q1411D, L1436D](A)	6.0		
5832c694BSt1pi1	1193-1427[Q1280E, Y1307N, E1308A, Q1309A, W1310H, Q1411D, 1427ins153](M)	1.5		"WT"(H1402) version of 5832c684
5832c695BSt1pi1	1193-1427[Q1280E, Q1411D, 1427ins153](M)	0.9		
5832c696BSt1pi1	1193-1427[Q1280E, H1402A, Q1411D, 1427ins153](M)	16.5		MalK dimerization domain (219-371) with D333R fusion at C-terminus
5832c697BSt1pi1	1193-1427[Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D, 1427ins153](M)	30.0		MalK dimerization domain (219-371) with D333R fusion at C-terminus
5832c700BSt5pi1	1193-1445[Q1280E, C1344S, C1355S, C1395S, C1400S, H1402A, Q1411D, L1436D](A)	4.5		
5832c701BSt1pi1	1193-1427[Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1348G, H1350Q, Q1411D, 1427ins153](M)	0.6		
5832c703BSt5pi1	1193-1427[Q1280E, 1427ins153](M)	0.5		MalK dimerization domain (219-371) fusion at C-terminus
5832c705BSt3pi1	1193-1427[Q1280E, H1402A, 1427ins153](M)	1.4		MalK dimerization domain (219-371) fusion at C-terminus
5832c709BSt1pi1	1193-1427[Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D, 1427ins153](M)	18.5		MalK dimerization domain (219-371) with F1442I fusion at C-terminus

5832c711BSt1pi1	1193-1427[Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D, 1427ins153](M)	6.6		MalK dimerization domain (219-371) with D1436S/V1439A/F1442I/I1443S fusion at C-terminus
5832c719BSt1pi1	1193-1427[Q1280E, P1290S, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D](A)	5.0		Q loop mutation, MalK dimerization domain (219-371) fusion at C-terminus
5832c724BSt1pi1	1193-1427[H1402A, Q1411D, 1427ins153](M)	1.5		MalK dimerization domain (219-371) fusion at C-terminus
5832c725BSt1pi1	1198-1445[Q1280E, P1290S, H1402A, Q1411D, L1436D](A)	2.7		Q loop P1290S mutation
5832c726BSt1pi1	1198-1445[Q1280E, P1290S, Q1411D, L1436D](A)	1.0		Q loop P1290S mutation
5832c727BSt1pi1	1202-1427[Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D, 1427ins153](M)	43.5		MalK dimerization domain (219-371) with D1436S/V1439A/F1442I/I1443S fusion at C-terminus
5832c728BSt1pi1	1193-1427[Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D, 1427ins153](M)	6.0		MalK dimerization domain (219-371) with F1442A fusion at C-terminus
5832c731BSt1pi1	1193-1427[1193ins38, H1402A, Q1411D, 1427ins153](M)	7.3		CL2 262-283 fusion with (SGGG) <sub>4</sub> linker at N-terminus, MalK dimerization domain (219-371) fusion at C-terminus
5832c732BSt1pi1	1199-1431[H1402A, Q1411D, 1431ins22](M)	2.3		CL2 262-283 fusion at C-terminus
5832c734BSt1pi1	1193-1442[Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D, L1436D, 1442ins137](M)	3.0		H8 and H9 helices are NBD2, MalK dimerization domain (235-371) fusion at C-terminus
5832c737BSt1pi1	1193-1427[Q1280E, P1290S, Y1307N, E1308A, Q1309A, W1310H, E1371Q, H1402A, Q1411D](A)	#N/A		
5832c738BSt1pi1	1198-1445[Q1280E, P1290S, E1371Q, H1402A, Q1411D, L1436D](A)	#N/A		
5832c739BSt1pi1	1198-1445[Q1280E, E1371Q, H1402A, Q1411D, L1436D](A)	0.3		

5832c740BSt1pi1	1198-1445[Q1280E, Q1411D, L1436D](A)	0.2		
5832c741BSt1pi1	1193-1427[Q1280E, P1290S, Y1307N, E1308A, Q1309A, W1310H, Q1411D](A)	#N/A		
5833c10BSt1pi1	1193-1459[V1198D, L1260D, Q1280E, Q1330E, E1371Q, Q1382E, Q1390E, L1436D](A)	2.6		
5833c35BSt1pi1	1193-1445[V1198D, L1260D, Q1280E, Q1330E, E1371Q, Q1382E, Q1390E, L1436D](A)	1.1		
5833c38BSt1pi1	1193-1459[V1198D, L1260D, Q1280E, Q1330E, E1371Q, Q1382E, Q1390E](A)	0.7		
5833c39BSt1pi1	1193-1459[V1198D, L1260D, Q1280E, Q1330E, E1371Q, Q1382E, L1436D](A)	2.0		
5833c40BSt1pi1	1193-1459[V1198D, L1260D, Q1280E, Q1330E, E1371Q, Q1390E, L1436D](A)	1.9		
5833c41BSt1pi1	1193-1459[V1198D, L1260D, Q1280E, E1371Q, Q1382E, Q1390E, L1436D](A)	3.0		
5833c42BSt1pi1	1193-1459[V1198D, L1260D, Q1330E, E1371Q, Q1382E, Q1390E, L1436D](A)	1.2		
5833c43BSt1pi1	1193-1459[V1198D, Q1280E, Q1330E, E1371Q, Q1382E, Q1390E, L1436D](A)	#N/A		
5833c44BSt1pi1	1193-1459[L1260D, Q1280E, Q1330E, E1371Q, Q1382E, Q1390E, L1436D](A)	2.2		
5833c45BSt1pi1	1193-1459[V1198D, Q1280E, Q1330E, E1371Q, Q1382E, Q1390E, L1436D](A)	24.0		
5833c46BSt1pi1	1193-1434[V1198D, L1260D, Q1280E, Q1330E, E1371Q, Q1382E, Q1390E](A)	0.7		
5833c47BSt1pi1	1201-1434[L1260D, Q1280E, Q1330E, E1371Q, Q1382E, Q1390E](A)	0.6		
5833c48BSt1pi1	1193-1445[V1198D, L1260D, Q1280E, Q1330E, Q1382E, Q1390E, L1436D](A)	1.6		
5833c49BSt1pi1	1193-1459[V1198D, L1260D, Q1280E, Q1330E, Q1382E, L1436D](A)	5.5		



5833c50BSt1pi1	1193-1459[V1198D, L1260D, Q1280E, Q1330E, Q1390E, L1436D](A)	3.3		
5833c51BSt1pi1	1193-1459[V1198D, L1260D, Q1330E, Q1382E, Q1390E, L1436D](A)	2.4		
5833c52BSt1pi1	1193-1459[V1198D, Q1280E, Q1330E, Q1382E, Q1390E, L1436D](A)	1.5		
5833c53BSt1pi1	1193-1459[V1198D, L1260D, Q1280E, Q1330E, Q1382E, Q1390E, H1402A, L1436D](A)	27.5		
5833c6BSt1pi1	1193-1459[A1225D, Q1268E, W1310Y, V1338D, E1371Q, Q1390E, N1432D](A)	0.4		
<b>Mouse NBD2</b>				
5832f41CLt1p1	1203-1421(A)	7.0		Protein insoluble, yield from denaturing purification
5832f4CLt1p1	1166-1457[Q1173R](A)	8.2		Protein insoluble, yield from denaturing purification
5832f5CLt1p1	1166-1447(A)	16.2		Protein insoluble, yield from denaturing purification
5833f2BSt1pi1	1189-1441[Q1276E, H1398A, Q1407D, I1432D](M)	3.5		
<b>Mummichog NBD2</b>				
5833b1BSt1pi1	1213-1463[Q1298E, Q1429D, H1454D](A)	17.5		
5833b2BSt1p1	1213-1463[Q1298E, H1420A, Q1429D, H1454D](A)	6.2		
5833b2BSt1pi1	1213-1463[Q1298E, H1420A, Q1429D, H1454D](A)	35.0		
5833b3BSt1pi1	1213-1463[Q1429D, H1454D](A)	4.0		
5833b4BSt1pi1	1213-1463[H1420A, Q1429D, H1454D](A)	14.0		
5833b5BSt1pi1	1213-1463[H1454D](A)	5.0		
5833b6BSt1pi1	1213-1463[Q1429D](A)	7.0		
5833b9BSt1pi1	1213-1463(A)	8.0		

<b>Linked NBD1- NBD2</b>				
5762c33BSt1pi1	388-1445[del405-436, N620H*, 646ins10, del647-1192, Q1280E, H1402A, Q1411D, L1436D](M)	3.5		388-646[del405-436]+(G4S)2+1193-1445 [Q1280E, H1402A, Q1411D, L1436D]
5762c34BSt1pi1	388-1445[del405-436, N620H*, 646ins15, del647-1192, Q1280E, H1402A, Q1411D, L1436D](M)	1.8		388-646[del405-436]+(G4S)3+1193-1445 [Q1280E, H1402A, Q1411D, L1436D]
5762c35BSt1pi1	388-1445[del405-436, N620H*, 646ins20, del647-1192, Q1280E, H1402A, Q1411D, L1436D](M)	1.6		388-646[del405-436]+(G4S)4+1193-1445 [Q1280E, H1402A, Q1411D, L1436D]
5762c36KFg2h1	388-1445[del405-436, N620H*, del647-1192, Q1280E, H1402A, Q1411D, L1436D](M)	0.7		388-646[del405-436]+(G4S)2+1193-1445 [Q1280E, H1402A, Q1411D, L1436D], Baculo construct
5762c37KFg2h2	388-1445[del405-436, N620H*, del647-1182, Q1280E, H1402A, Q1411D, L1436D](M)	1.8		388-646[del405-436]+(G4S)3+1193-1445 [Q1280E, H1402A, Q1411D, L1436D], Baculo construct
5762c38KFg2h2	388-1445[del405-436, N620H*, del647-1192, Q1280E, H1402A, Q1411D, L1436D](M)	2.2		388-646[del405-436]+(G4S)4+1193-1445 [Q1280E, H1402A, Q1411D, L1436D], Baculo construct
5762c40KFg2h1	388-1445[del405-436, N620H*, del647-1192, Q1280E, Q1411D, L1436D](M)	0.8		388-646[del405-436]+(G4S)2+1193-1445 [Q1280E, Q1411D, L1436D], Baculo construct
5762c41KWg2h1	388-1445[del405-436, N620H*, del647-1192, Q1280E, H1402A, Q1411D, L1436D](M)	1.7		388-646[del405-436]+(G4S)2+1193-1445 [Q1280E, H1402A, Q1411D, L1436D], Baculo construct
5762c43BSt1pi1	388-1445[del405-436, G576C, Y577H, N620H*, 646ins10, del647-1192, Q1280E, H1402A, Q1411D, L1436D](M)	3.5		388-646[del405-436, G576C, Y577H]+(G4S)2+1193-1445 [Q1280E, H1402A, Q1411D, L1436D]
5762c47BSt1pi1	388-1427[del405-436, N620H*, 630ins161, del631-1192, Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D, 1427ins153](M)	0.9		388-630[del405-436]+Malk fusion +(G4S)2+1193-1427[Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D]+ Malk fusion

5762c48BSt1pi1	388-1427[del405-436, N620H*, 630ins171, del631-1192, Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D, 1427ins153](M)	0.4		388-630[del405-436]+MalK fusion+(G4S)4+1193-1427[Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D]+MalK fusion
5762c51BSt1pi1	388-1446[del405-436, N620H*, L833F*, del842-1169, Q1280E, H1402A, Q1411D, L1436D](M)	0.3		388-841[del405-436, L833F] +R domain+1170-1146 [Q1280E, H1402A, Q1411D, L1436D]
5762c52BSt1pi1	1193-646[del405-436, F494N, Q637R, q1280e, y1307n, e1308a, Q1309A, W1310H, H1402A, Q1411D, 1464ins7](M)	1.0		394-646 [del405-436, F494N, Q637R]+RLI (short)+1193-1464 [Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D]
5762c54BSt1pi1	1193-646[del405-436, F494N, Q637R, Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D, 1446ins22](M)	3.0		394-646 [del405-436, F494N, Q637R]+RLI (long)+1193-1446 [Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D]
5762c55BSt1pi1	1193-646[del405-436, F494N, Q637R, 1193ins7, Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D, 1442ins19](M)	0.5		392-646 [del405-436, F494N, Q637R]+Gi 19704501+1193-1442 [Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D]
5762c56BSt1pi1	1193-646[del405-436, F494N, Q637R, Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D, 1443ins18](M)	0.4		392-646 [del405-436, F494N, Q637R]+E. coli ARAG+1193-1443 [Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D]
5762c57BSt1pi1	1193-646[del405-436, F494N, Q637R, Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D, 1442ins19](M)	0.2		391-646 [del405-436, F494N, Q637R]+E. coli MGLA+1193-1442 [Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D]
5762c58BSt1pi1	1193-646[del405-436, F494N, Q637R, Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D, 1442ins20](M)	1.1		392-646 [del405-436, F494N, Q637R]+Gi 2492540+1193-1442[Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D]

5762c59BSt1pi1	1193-646[del405-436, F494N, Q637R, Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D, 1441ins21](M)	0.3		394-646 [del405-436, F494N, Q637R]+Gi 17547476+1193-1441 [Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D]
5762c60BSt1pi1	1193-646[del405-436, F494N, Q637R, Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D, 1442ins19](M)	0.8		394-646 [del405-436, F494N, Q637R]+Gi 110644445+1193-1442 [Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D]
5762c61BSt1pi1	1193-646[del405-436, F494N, Q637R, Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D, 1441ins19](M)	0.6		392-646 [del405-436, F494N, Q637R]+Gi 26250495+1193-1441 [Q1280E, Y1307N, E1308A, Q1309A, W1310H, H1402A, Q1411D]
5762c7BSt1pd1	389-1446[F429S, N620H*, 679ins10, del679-1206, E1371Q](M)	0.4		NBD1-(G4S)2-NBD2
5762c7BSt1pi1	389-1446[F429S, N620H*, 679ins10, del679-1206, E1371Q](M)	0.4		NBD1-(G4S)2-NBD2