

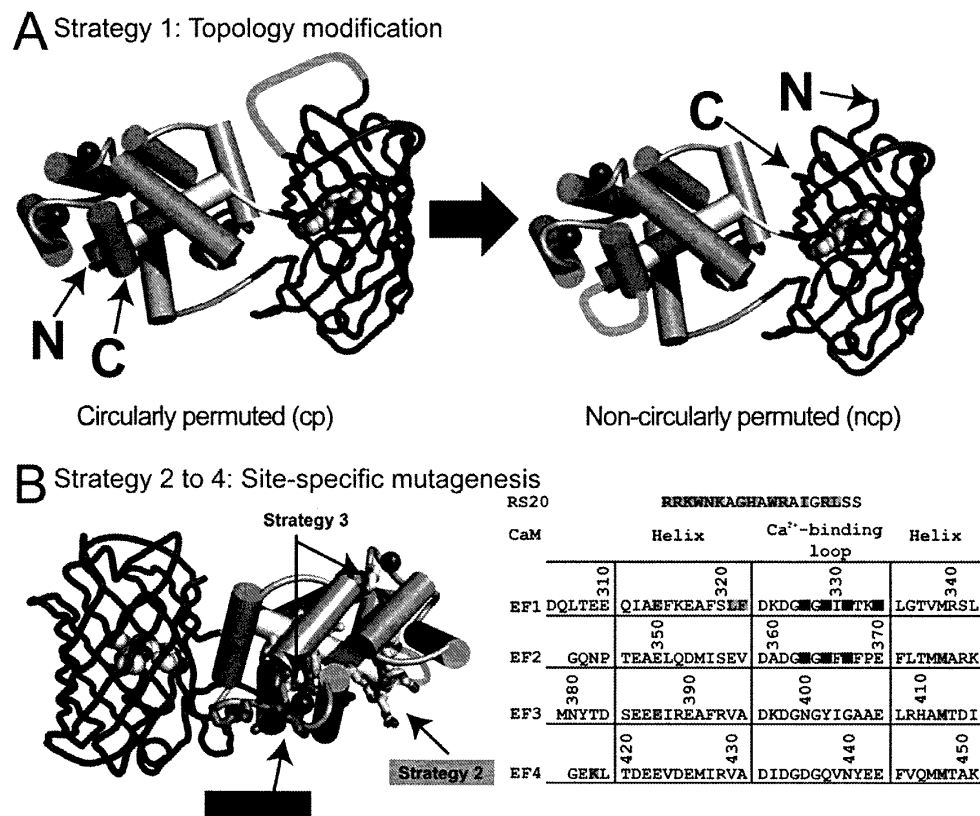


Figure 1



GCaMP #s	Linker		CaM	
	303	304	305	310
LAR-GECO1	D G V F I Y K V K L R G T N F P P D G P V M Q K K T M G W E A T R R D Q L T E E Q			
LAR-GECO1.5	D G V F I Y K V K L R G T N F P P D G P V M Q K K T M G W E A T R R D Q L T E E Q			
LAR-GECO2	D G V F I Y K V K L R G T N F P P D G P V M Q K K T M G W E A T R R D Q L T E E Q			
LAR-GECO3	D G V F I Y K V K L R G T N F P P D G P V M Q K K T M G W E A T R R D Q L T E E Q			
LAR-GECO4	D G V F I Y K V K L R G T N F P P D G P V M Q K K T M G W E A T R R D Q L T E E Q			
GCaMP #6	312	313	314	315
LAR-GECO1	I A E F K E A F S L F D K D G D G T I T T K E L G T V M R S L G Q N P T F A E E L			
LAR-GECO1.5	I A E F K E A F S L F D K D G D G T I T T K E L G T V M R S L G Q N P T F A E E L			
LAR-GECO2	I A E F K E A F S L F D K D G D G T I T T K E L G T V M R S L G Q N P T F A E E L			
LAR-GECO3	I A E F K E A F S L F D K D G D G T I T T K E L G T V M R S L G Q N P T F A E E L			
LAR-GECO4	I A E F K E A F S L F D K D G D G T I T T K E L G T V M R S L G Q N P T F A E E L			
GCaMP #8	322	323	324	325
LAR-GECO1	Q D M I S E V D A D G D G T F D F P E F L T M M A R K M N Y T D S E E E I R E A			
LAR-GECO1.5	Q D M I S E V D A D G D G T F D F P E F L T M M A R K M N Y T D S E E E I R E A			
LAR-GECO2	Q D M I S E V D A D G D G T F D F P E F L T M M A R K M N Y T D S E E E I R E A			
LAR-GECO3	Q D M I S E V D A D G D G T F D F P E F L T M M A R K M N Y T D S E E E I R E A			
LAR-GECO4	Q D M I S E V D A D G D G T F D F P E F L T M M A R K M N Y T D S E E E I R E A			
GCaMP #9	332	333	334	335
LAR-GECO1	F R V A D K D G N G Y I G A A E L R H A M T D I G E K L T D E E V D E M I R V A			
LAR-GECO1.5	F R V A D K D G N G Y I G A A E L R H A M T D I G E K L T D E E V D E M I R V A			
LAR-GECO2	F R V A D K D G N G Y I G A A E L R H A M T D I G E K L T D E E V D E M I R V A			
LAR-GECO3	F R V A D K D G N G Y I G A A E L R H A M T D I G E K L T D E E V D E M I R V A			
LAR-GECO4	F R V A D K D G N G Y I G A A E L R H A M T D I G E K L T D E E V D E M I R V A			
GCaMP #s	432	433	434	435
LAR-GECO1	D I D G D G Q V N Y E E F V Q M M T A K -			
LAR-GECO1.5	D I D G D G Q V N Y E E F V Q M M T A K -			
LAR-GECO2	D I D G D G Q V N Y E E F V Q M M T A K -			
LAR-GECO3	D I D G D G Q V N Y E E F V Q M M T A K -			
LAR-GECO4	D I D G D G Q V N Y E E F V Q M M T A K -			

Figure 2 (continued)

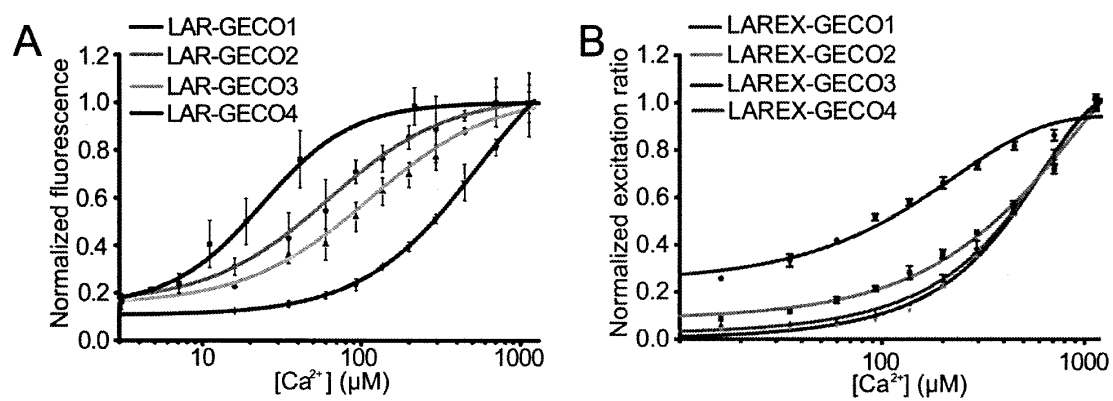
GCaMP #s	LAREX-GECO1 LAREX-GECO2 LAREX-GECO3 LAREX-GECO4	RS20	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	Linker	cp linker	152	153	154	155	156	157	158	N-term- N-term- S L N-term-																		
			S	S	R	R	K	W	N	K	A	G	H	A	W	R	A	I	G	R	L	S	S	R	W	-	V											S	E	W	M	Y	P	E	D	G	A	L	K	S	V	I			
			S	S	R	R	K	W	N	K	A	G	H	A	W	R	A	I	G	R	L	S	S	R	W	-	V											S	E	W	M	Y	P	E	D	G	A	L	K	S	V	I			
			S	S	R	R	K	W	N	K	A	G	H	A	W	R	A	I	G	R	L	S	S	R	W	-	V											S	E	W	M	Y	P	E	D	G	A	L	K	S	V	I			
GCaMP #s	LAREX-GECO1 LAREX-GECO2 LAREX-GECO3 LAREX-GECO4	RS20	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	Linker	cp linker	152	153	154	155	156	157	158	N-term- N-term- S L N-term-																		
			K	E	G	L	R	L	K	D	G	G	H	Y	A	A	-	-	E	R	K	T	T	Y	K	A	K											K	P	V	Q	L	P	G	A	Y	I	V	D	I	K	L			
			K	E	G	L	R	L	K	D	G	G	H	Y	A	A	-	-	E	R	K	T	T	Y	K	A	K											K	P	V	Q	L	P	G	A	Y	I	V	D	I	K	L			
			K	E	G	L	R	L	K	D	G	G	H	Y	A	A	-	-	E	R	K	T	T	Y	K	A	K											K	P	V	Q	L	P	G	A	Y	I	V	D	I	K	L			
GCaMP #s	LAREX-GECO1 LAREX-GECO2 LAREX-GECO3 LAREX-GECO4	RS20	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	Linker	cp linker	152	153	154	155	156	157	158	N-term- N-term- S L N-term-																		
			D	I	V	S	-	H	N	E	D	Y	T	I	V	E	Q	C	E	R	A	E	G	R	H	S	T											G	G	M	D	E	L	Y	K	-	C-term	152	153	154	155	156	157	158	
			D	I	V	S	-	H	N	E	D	Y	T	I	V	E	Q	C	E	R	A	E	G	R	H	S	T											G	G	M	D	E	L	Y	K	-	C-term	152	153	154	155	156	157	158	
			D	I	V	S	-	H	N	E	D	Y	T	I	V	E	Q	C	E	R	A	E	G	R	H	S	T											G	G	M	D	E	L	Y	K	-	C-term	152	153	154	155	156	157	158	
GCaMP #s	LAREX-GECO1 LAREX-GECO2 LAREX-GECO3 LAREX-GECO4	RS20	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	Linker	cp linker	152	153	154	155	156	157	158	N-term- N-term- S L N-term-																		
			V	S	K	G	E	E	D	N	M	A	I	I	K	E	F	M	R	F	K	V	H	M	E	G	S											T	G	G	M	D	E	L	Y	K	-	C-term	152	153	154	155	156	157	158
			V	S	K	G	E	E	D	N	M	A	I	I	K	E	F	M	R	F	K	V	H	M	E	G	S											T	G	G	M	D	E	L	Y	K	-	C-term	152	153	154	155	156	157	158
			V	S	K	G	E	E	D	N	M	A	I	I	K	E	F	M	R	F	K	V	H	M	E	G	S											T	G	G	M	D	E	L	Y	K	-	C-term	152	153	154	155	156	157	158
GCaMP #s	LAREX-GECO1 LAREX-GECO2 LAREX-GECO3 LAREX-GECO4	RS20	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	Linker	cp linker	152	153	154	155	156	157	158	N-term- N-term- S L N-term-																		
			P	Y	E	A	F	Q	T	A	K	L	K	V	T	K	G	G	P	L	P	F	A	W	D	I	L											S	L	Q	F	M	Y	G	S	K	A	Y	I	K	H	P			
			P	Y	E	A	F	Q	T	A	K	L	K	V	T	K	G	G	P	L	P	F	A	W	D	I	L											S	L	Q	F	M	Y	G	S	K	A	Y	I	K	H	P			
			P	Y	E	A	F	Q	T	A	K	L	K	V	T	K	G	G	P	L	P	F	A	W	D	I	L											S	L	Q	F	M	Y	G	S	K	A	Y	I	K	H	P			
GCaMP #s	LAREX-GECO1 LAREX-GECO2 LAREX-GECO3 LAREX-GECO4	RS20	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	Linker	cp linker	152	153	154	155	156	157	158	N-term- N-term- S L N-term-																		
			A	D	I	P	-	-	D	Y	F	K	L	S	F	P	E	G	F	R	W	E	R	V	M	I	F											E	D	G	G	I	I	H	V	N	Q	D	S	S	L	Q			
			A	D	I	P	-	-	D	Y	F	K	L	S	F	P	E	G	F	R	W	E	R	V	M	I	F											E	D	G	G	I	I	H	V	N	Q	D	S	S	L	Q			
			A	D	I	P	-	-	D	Y	F	K	L	S	F	P	E	G	F	R	W	E	R	V	M	I	F											E	D	G	G	I	I	H	V	N	Q	D	S	S	L	Q			

Figure 3

GCaMP #s LAREX-GECO1 LAREX-GECO2 LAREX-GECO3 LAREX-GECO4	Linker		CaM	
	303	304	305	306
	307	308	309	310
	311			
GCaMP #s LAREX-GECO1 LAREX-GECO2 LAREX-GECO3 LAREX-GECO4	312	313	314	315
	316	317	318	319
	320	321	322	323
	324	325	326	327
GCaMP #s LAREX-GECO1 LAREX-GECO2 LAREX-GECO3 LAREX-GECO4	328	329	330	331
	332	333	334	335
	336	337	338	339
	340	341	342	343
GCaMP #s LAREX-GECO1 LAREX-GECO2 LAREX-GECO3 LAREX-GECO4	344	345	346	347
	348	349	350	351
GCaMP #s LAREX-GECO1 LAREX-GECO2 LAREX-GECO3 LAREX-GECO4	352	353	354	355
	356	357	358	359
	360	361	362	363
	364	365	366	367
GCaMP #s LAREX-GECO1 LAREX-GECO2 LAREX-GECO3 LAREX-GECO4	368	369	370	371
	372	373	374	375
	376	377	378	379
	380	381	382	383
GCaMP #s LAREX-GECO1 LAREX-GECO2 LAREX-GECO3 LAREX-GECO4	384	385	386	387
	388	389	390	391
GCaMP #s LAREX-GECO1 LAREX-GECO2 LAREX-GECO3 LAREX-GECO4	392	393	394	395
	396	397	398	399
	400	401	402	403
	404	405	406	407
GCaMP #s LAREX-GECO1 LAREX-GECO2 LAREX-GECO3 LAREX-GECO4	408	409	410	411
	412	413	414	415
	416	417	418	419
	420	421	422	423
GCaMP #s LAREX-GECO1 LAREX-GECO2 LAREX-GECO3 LAREX-GECO4	424	425	426	427
	428	429	430	431
GCaMP #s LAREX-GECO1 LAREX-GECO2 LAREX-GECO3 LAREX-GECO4	432	433	434	435
	436	437	438	439
	440	441	442	443
	444	445	446	447
GCaMP #s LAREX-GECO1 LAREX-GECO2 LAREX-GECO3 LAREX-GECO4	448	449	450	451
	452	453	454	455
	456	457	458	459
	460	461	462	463

Figure 3 (continued)

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**Figure 4**

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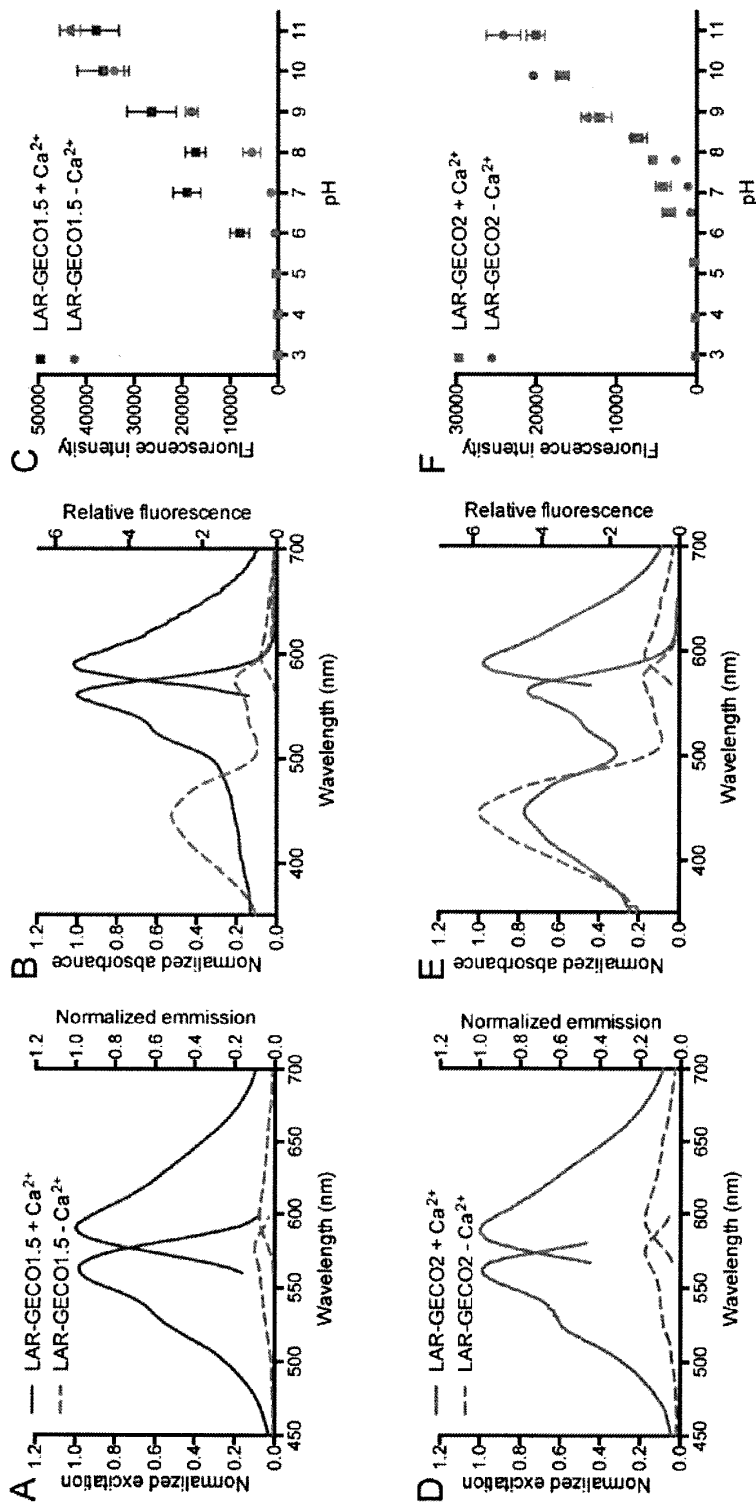


Figure 5

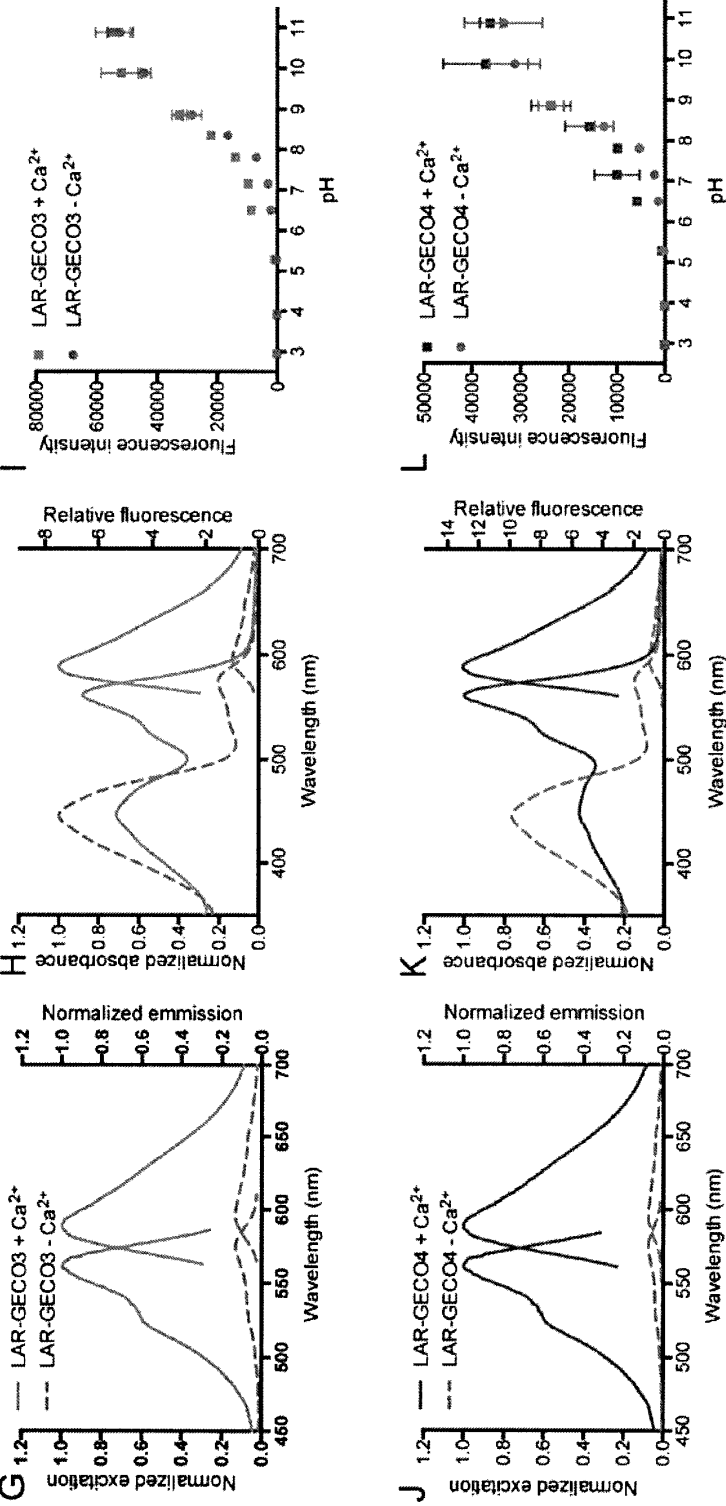


Figure 5 (continued)

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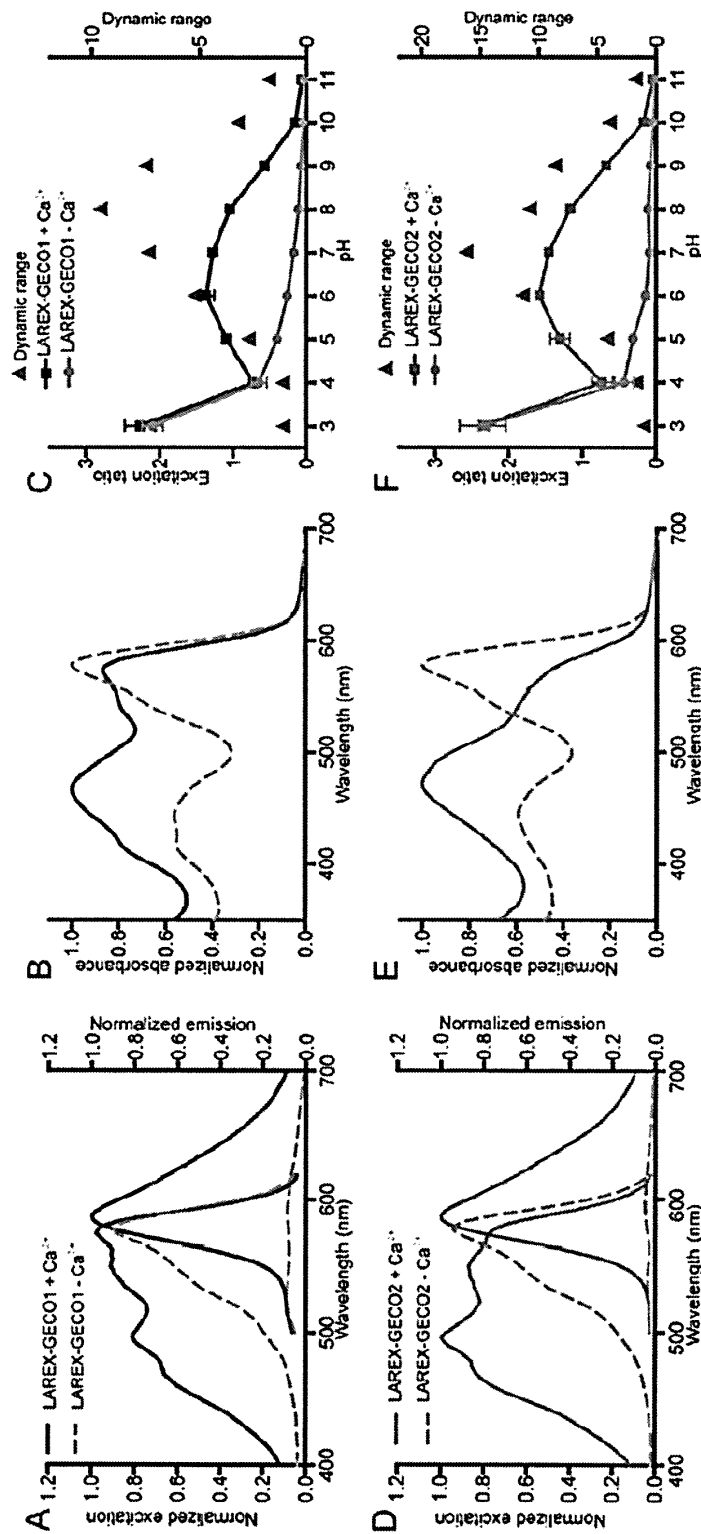


Figure 6

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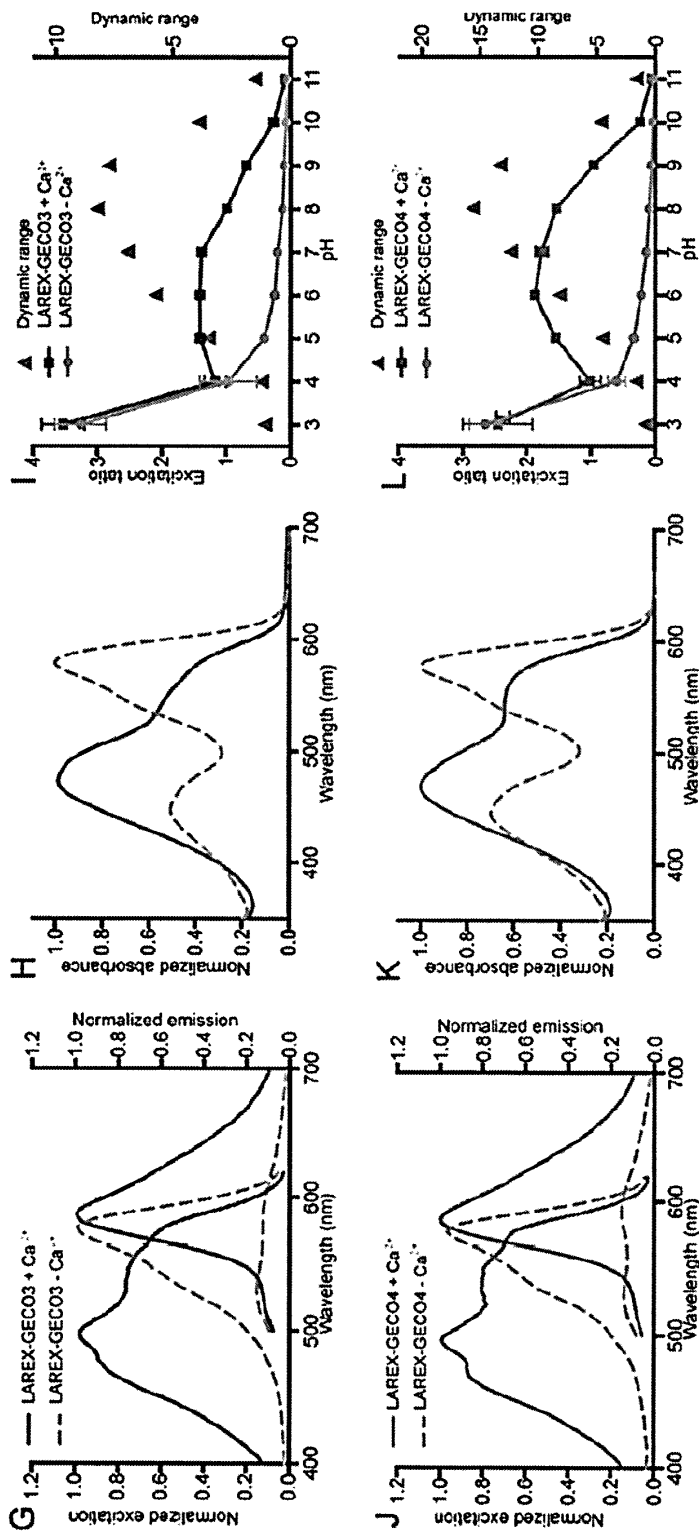
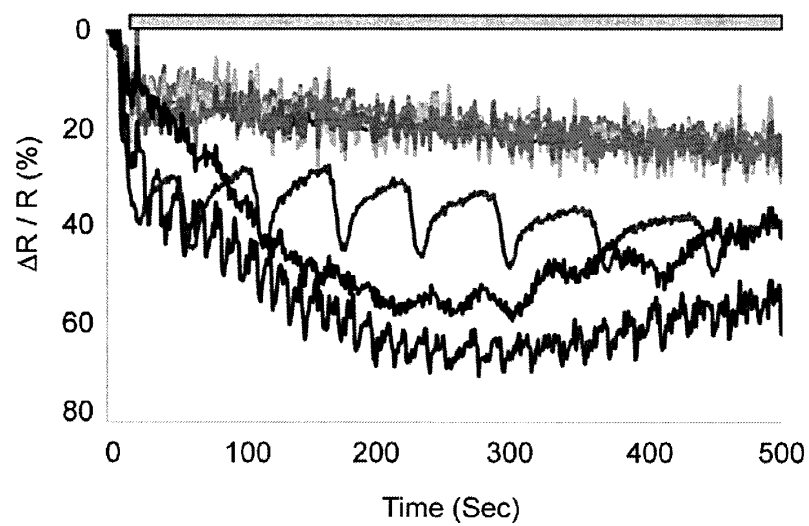


Figure 6 (continued)

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LAREX-GE04
histamine**Figure 7**

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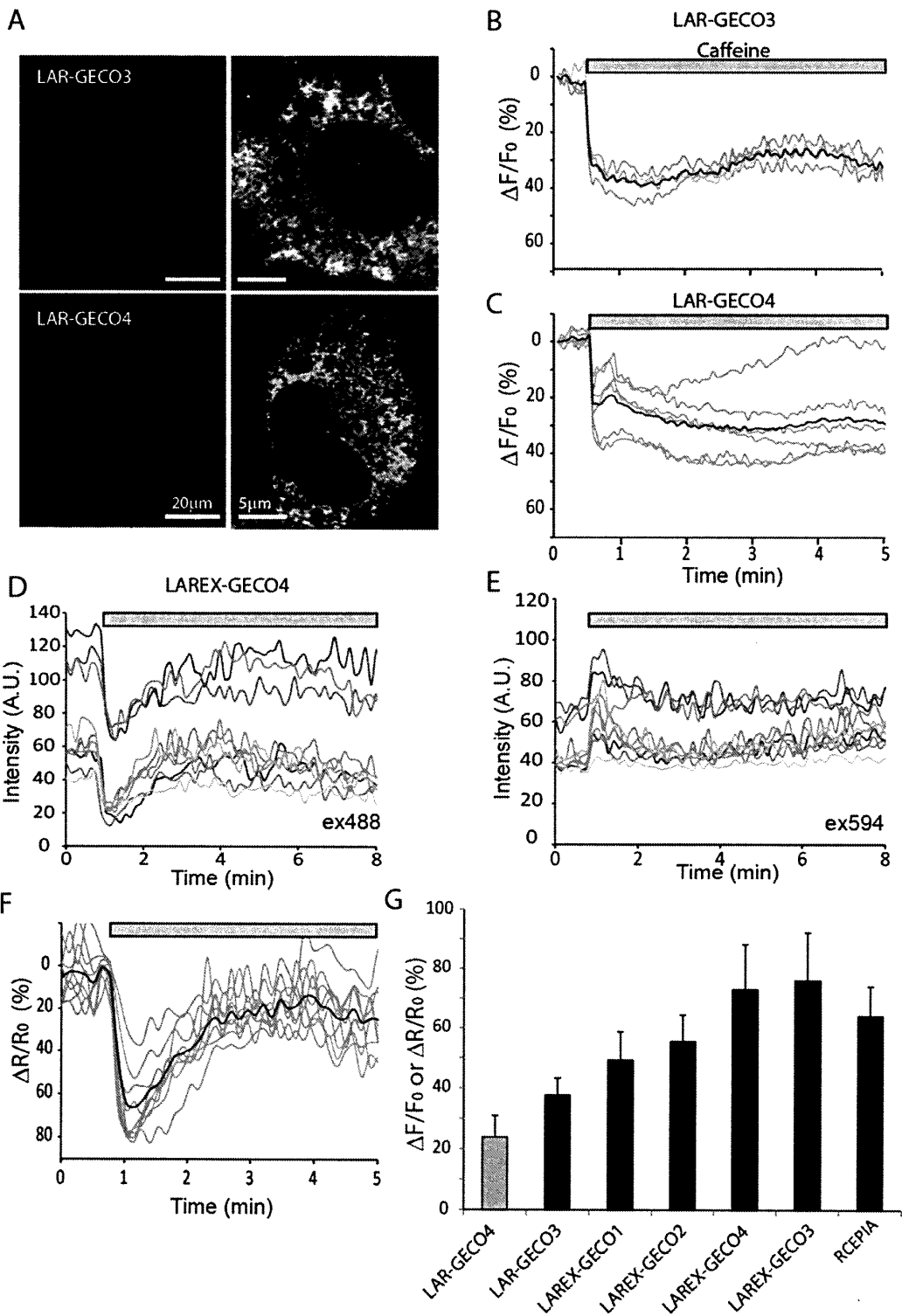


Figure 8

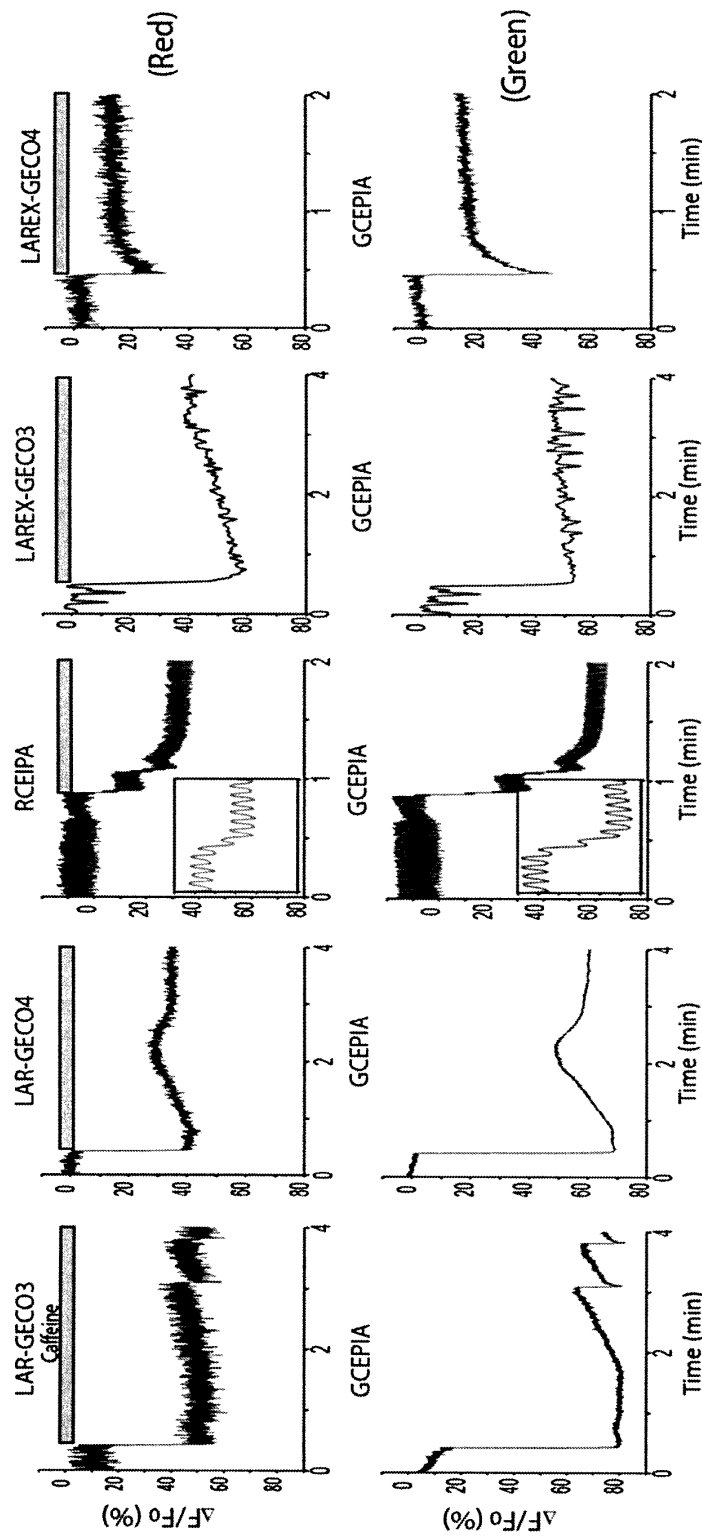


Figure 9

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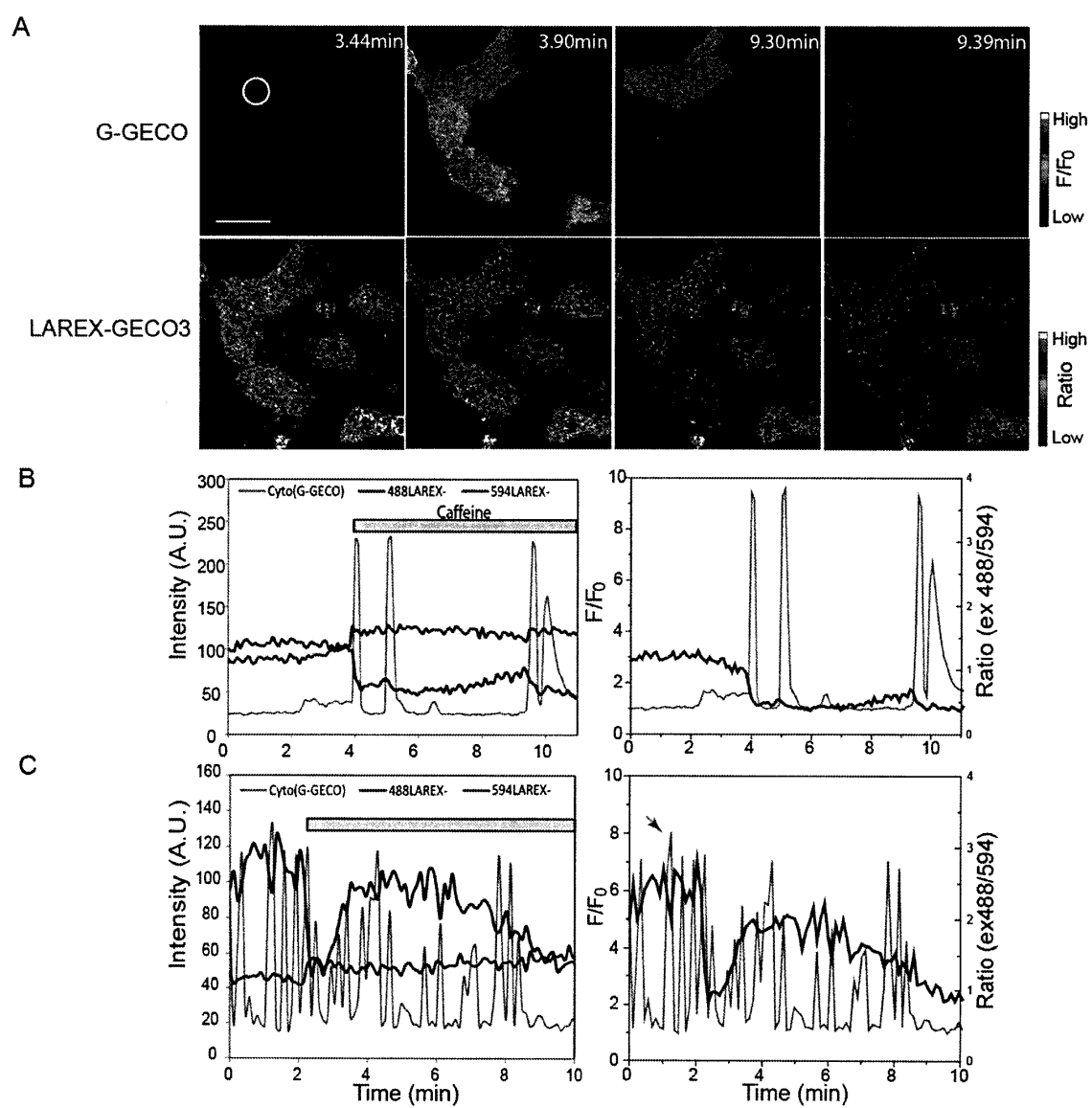


Figure 10

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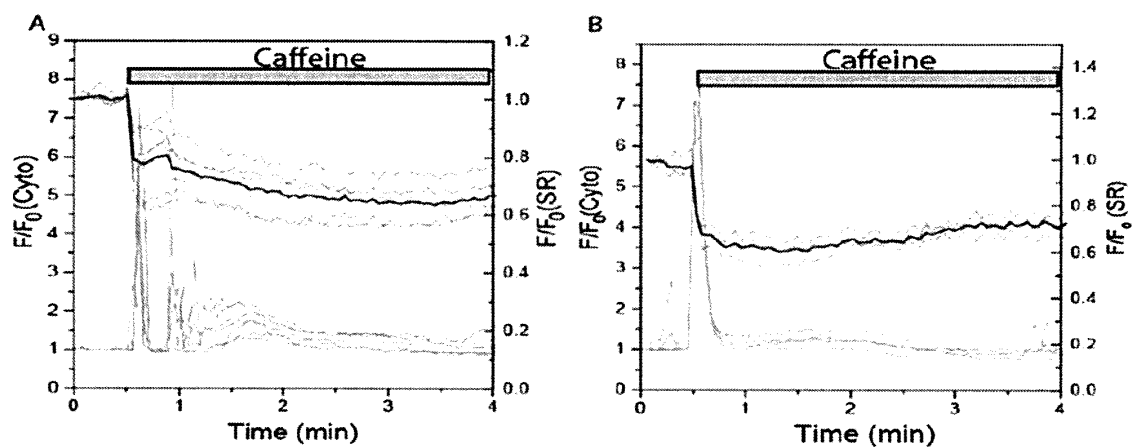


Figure 11

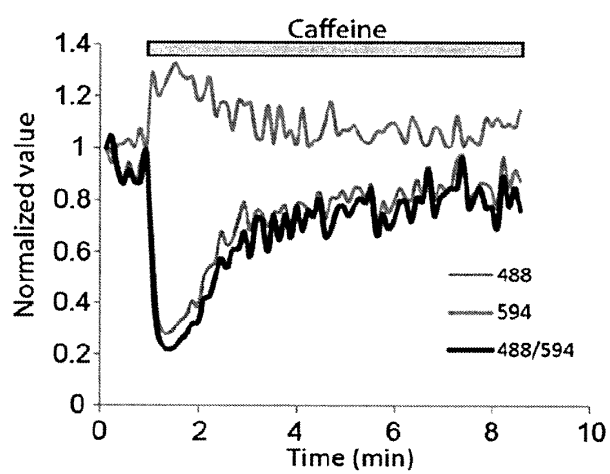


Figure 12

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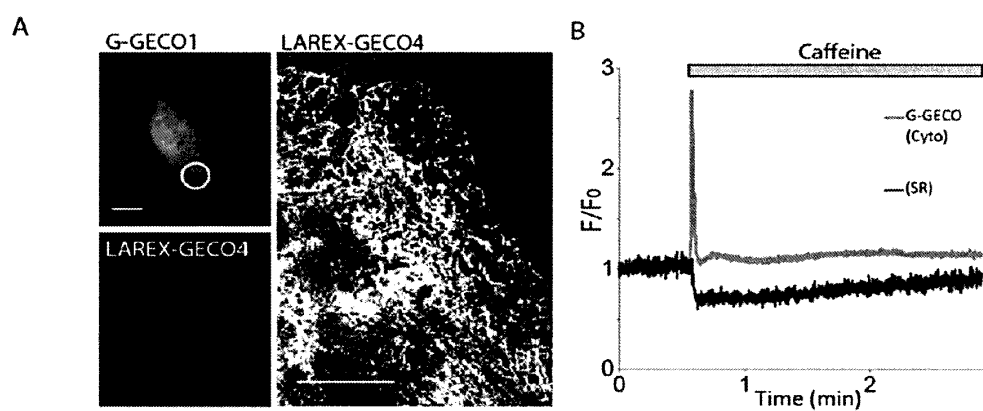


Figure 13

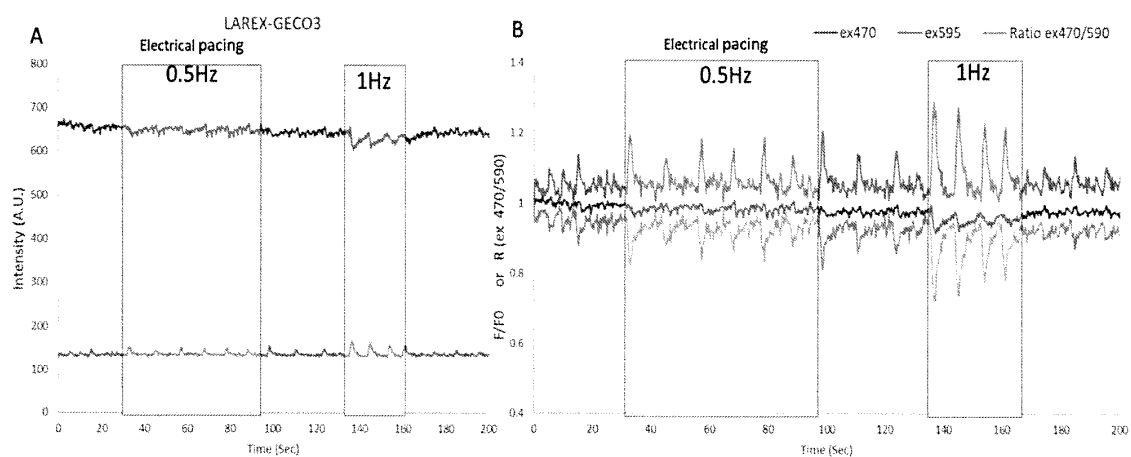


Figure 14

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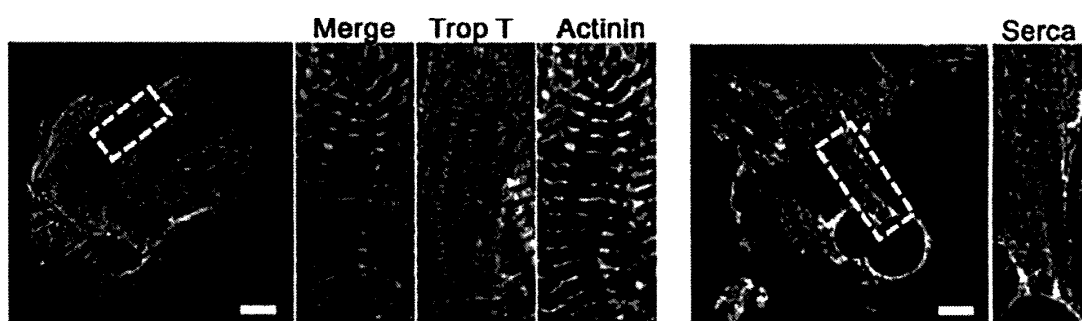


Figure 15

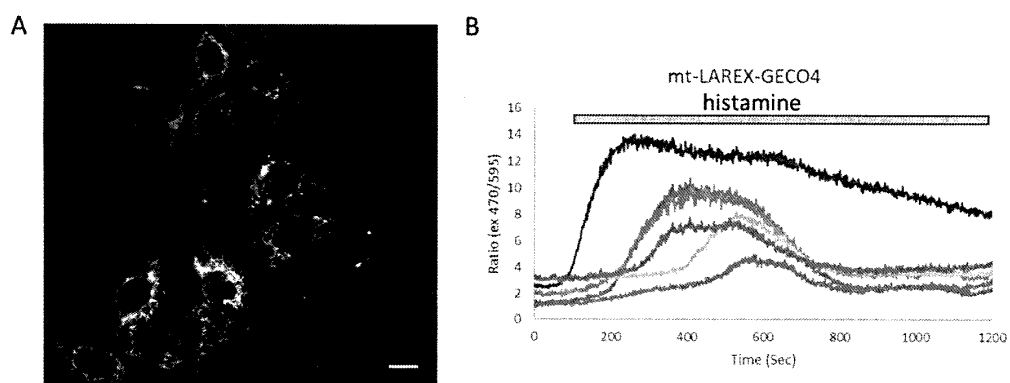


Figure 16