Photon is Our Business

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Telephone: (886)2-2698-1143

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Taipei City 114, Taiwan R.O.C.
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Seoul, 150-010, Korea
Telephone: (82)2-780-8515

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Sungsoo-2ga, Sungdong-Gu
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Systems Division
812 Joko-cho

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Telephone: (1)908-231-0960

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Telephone: (1)732-356-1203

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2875 Moorpark Ave., Suite 110
San Jose, CA 95128, U.S.A.
Telephone: (1)408-261-2022

Chicago office
1410 Higgins Road, Suite 202
Park Ridge, IL 60068, U.S.A.
Telephone: (1)847-825-6046

Systems Division, Main office
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Telephone: (1)908-231-1116

Systems Division, Sunnyvale Office
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Sunnyvale, CA 94089, U.S.A.
Telephone: (1)408-541-7370

Inspex Inc.
47 Manning Road
Billerica, MA 01821, U.S.A.
Telephone: (1)978-667-5500

Universal Spectrum Corporation
250 Wood Avenue
Middlesex, NJ 08846, U.S.A.
Telephone: (1)732-805-1965

- A leader in optoelectronic components and advanced detector systems
- Founded 1953, based in Hamamatsu City, Japan
- Worldwide sales and service organisation, 3500 Employees
- Revenue $0.9B (2008)

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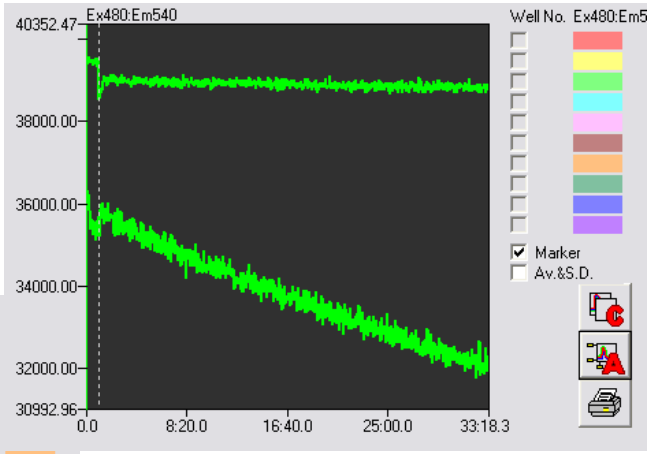
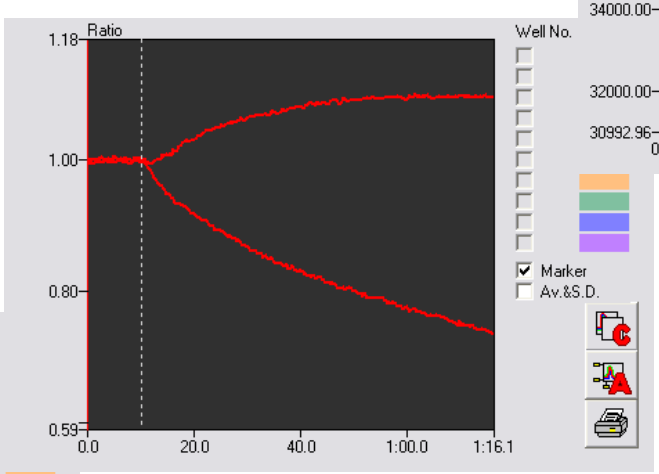
Typical lab settings for different assays

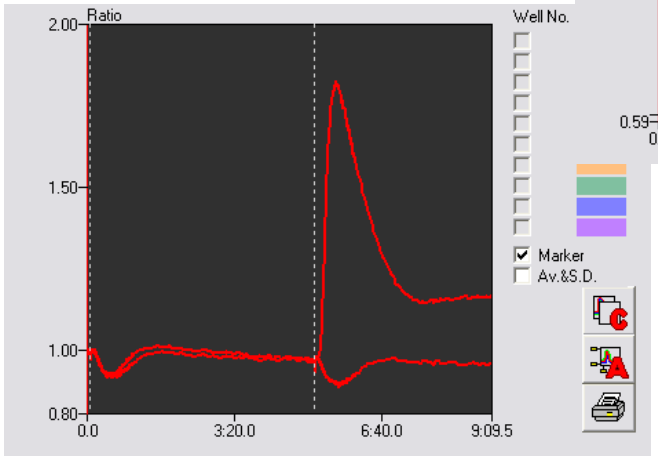
Enzyme etc



Ion channel



GPCR



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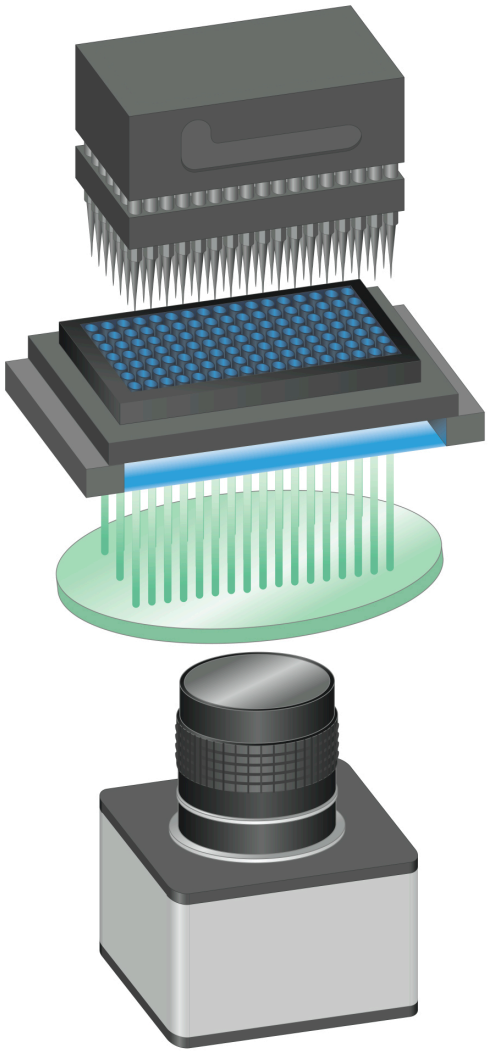
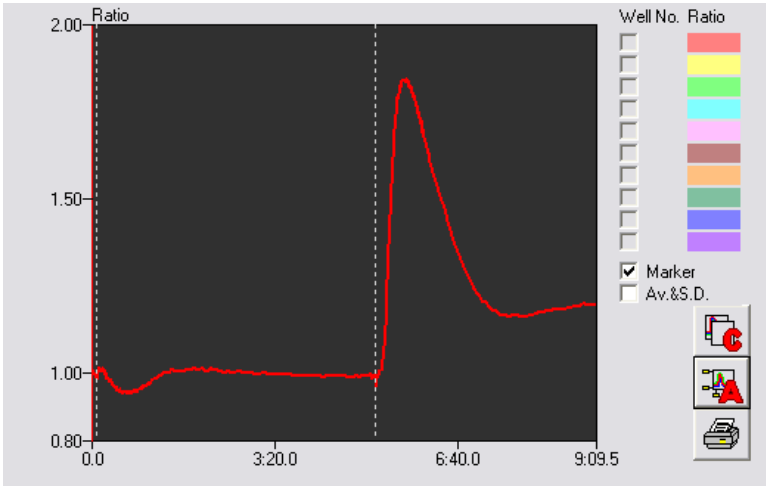
What does Hamamatsu FDSS do?



Add

384 well s at a time



Read

fluorescence & luminescence

0.01Hz (100s) to 40Hz (25ms)

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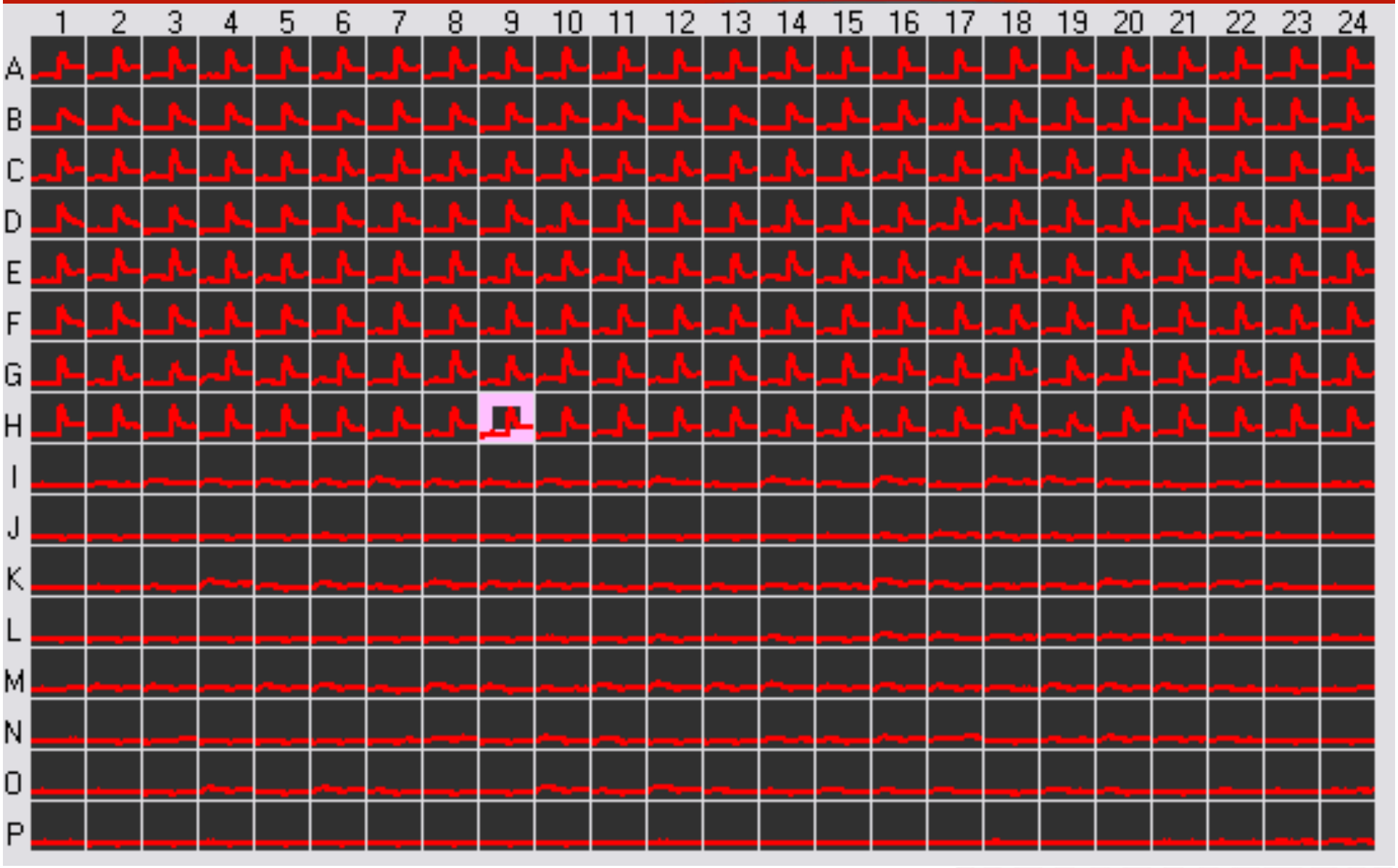
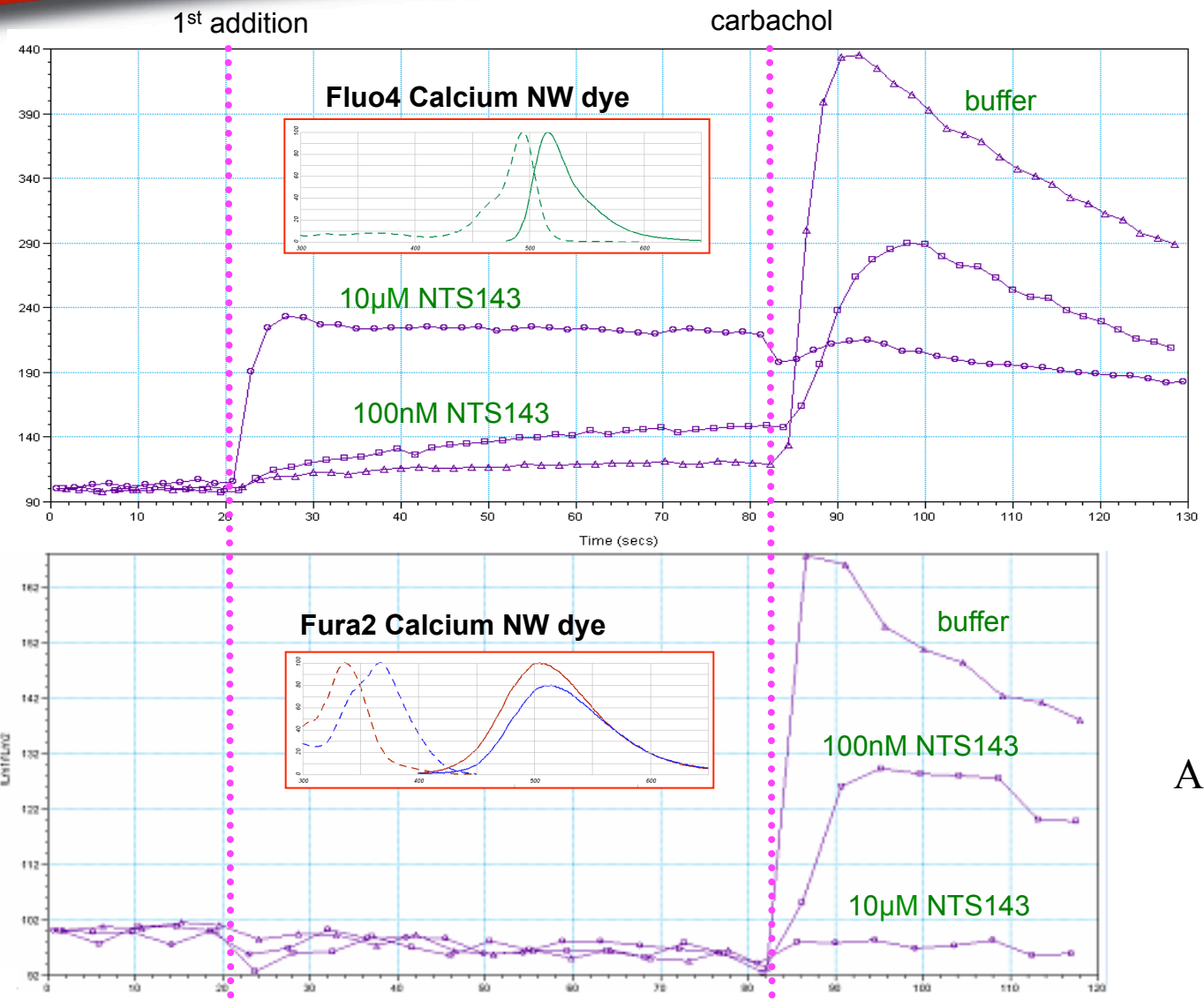
Shorter read time and better data quality



Assays ran on FDSS

- GPCR calcium influx assays
  - All calcium wash or non-washing kits (Fluo-4 or Fura-2 based), Premo™ Cameleon, Aequorin
- Ion Channel assays
  - FMP, VSP, potassium channel (FluxOR™), sodium channel (SBFI and ANG-2), chloride channel (YFP)
- Enzymatic assays
  - Prolyl isomerase, GTPase, Kvβ
- Transporter assays
- CytoStar-T
- Circadian clock
- Mosquito Odorant Receptors
- Light activated receptor or channel assays

Use of Fura2 calcium dye in screening



Agonist?

Antagonist!

BD

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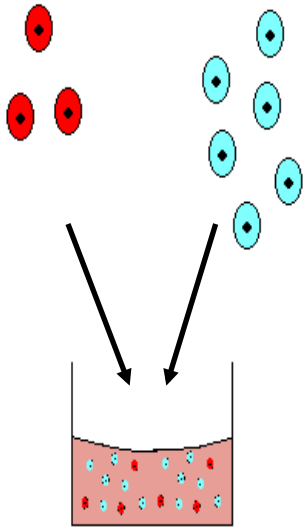
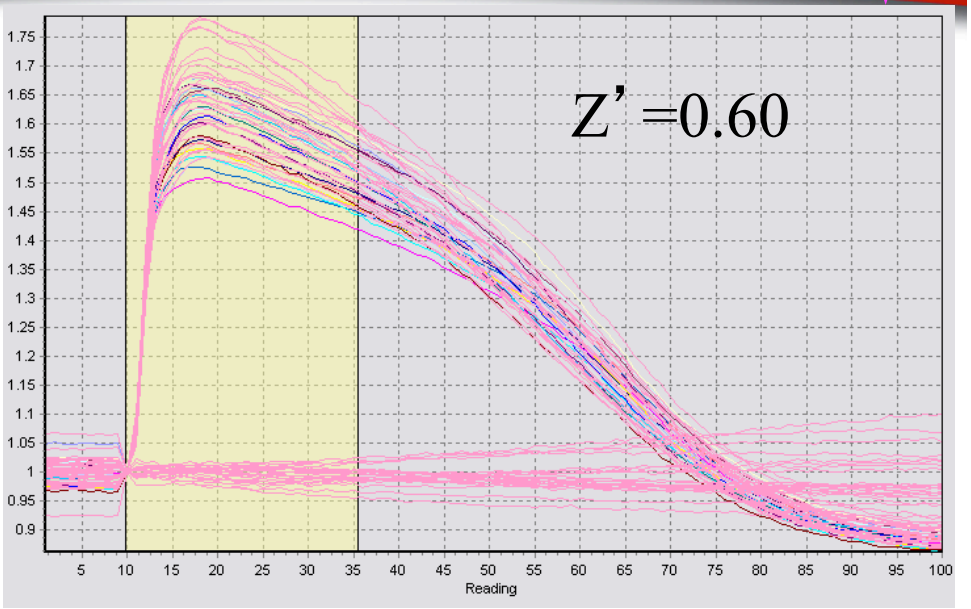
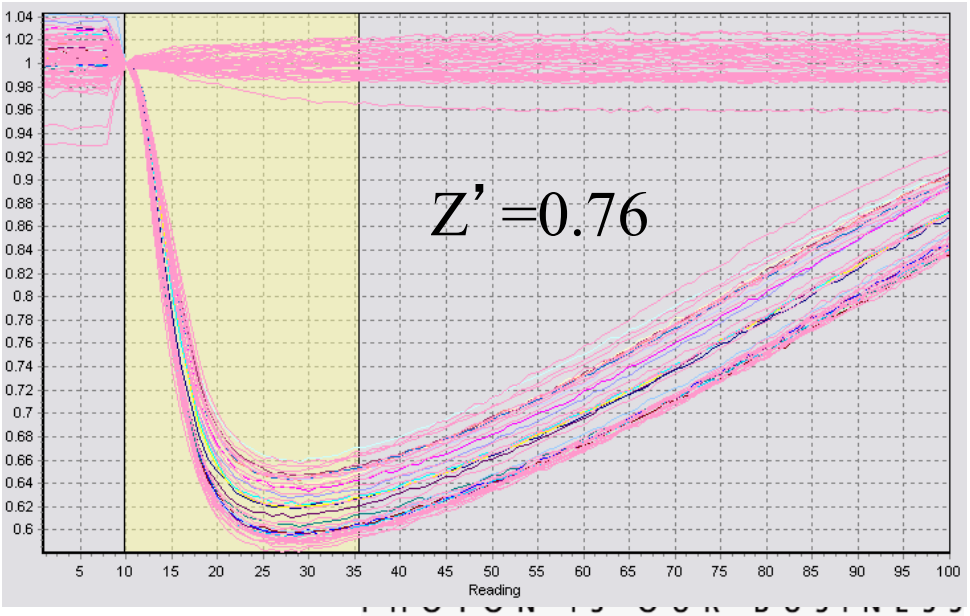
Multiplexing: Fluo3 & Fura2

Fluo-3 AM Loaded Cells

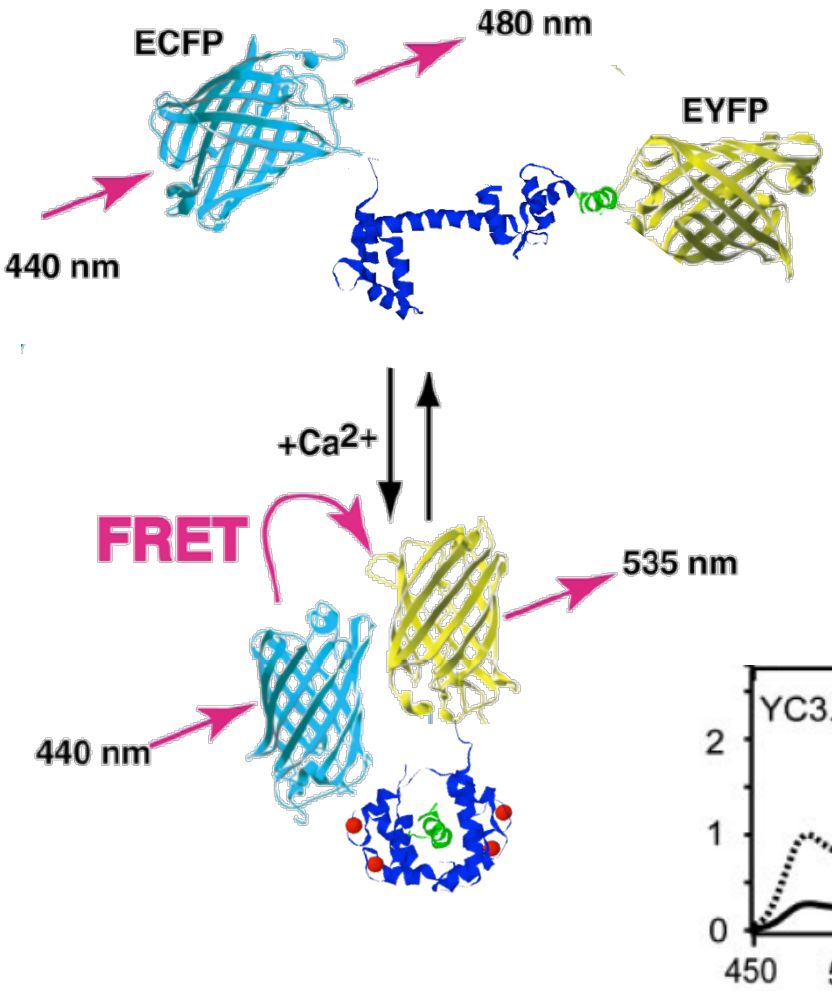
Fura-2 AM Loaded Cells

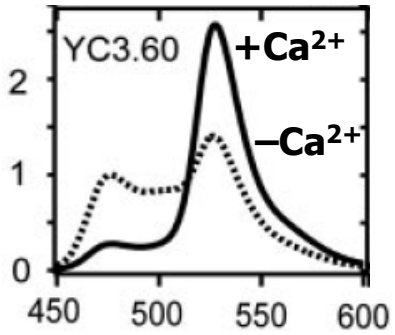






Premo™ Cameleon Calcium Sensor





- Calcium sensor packaged in BacMam virus
- Transduces hard-to-transfect cells
- Frozen storage of transduced cells
- True ‘no wash’ – screen in full medium

invitrogen™

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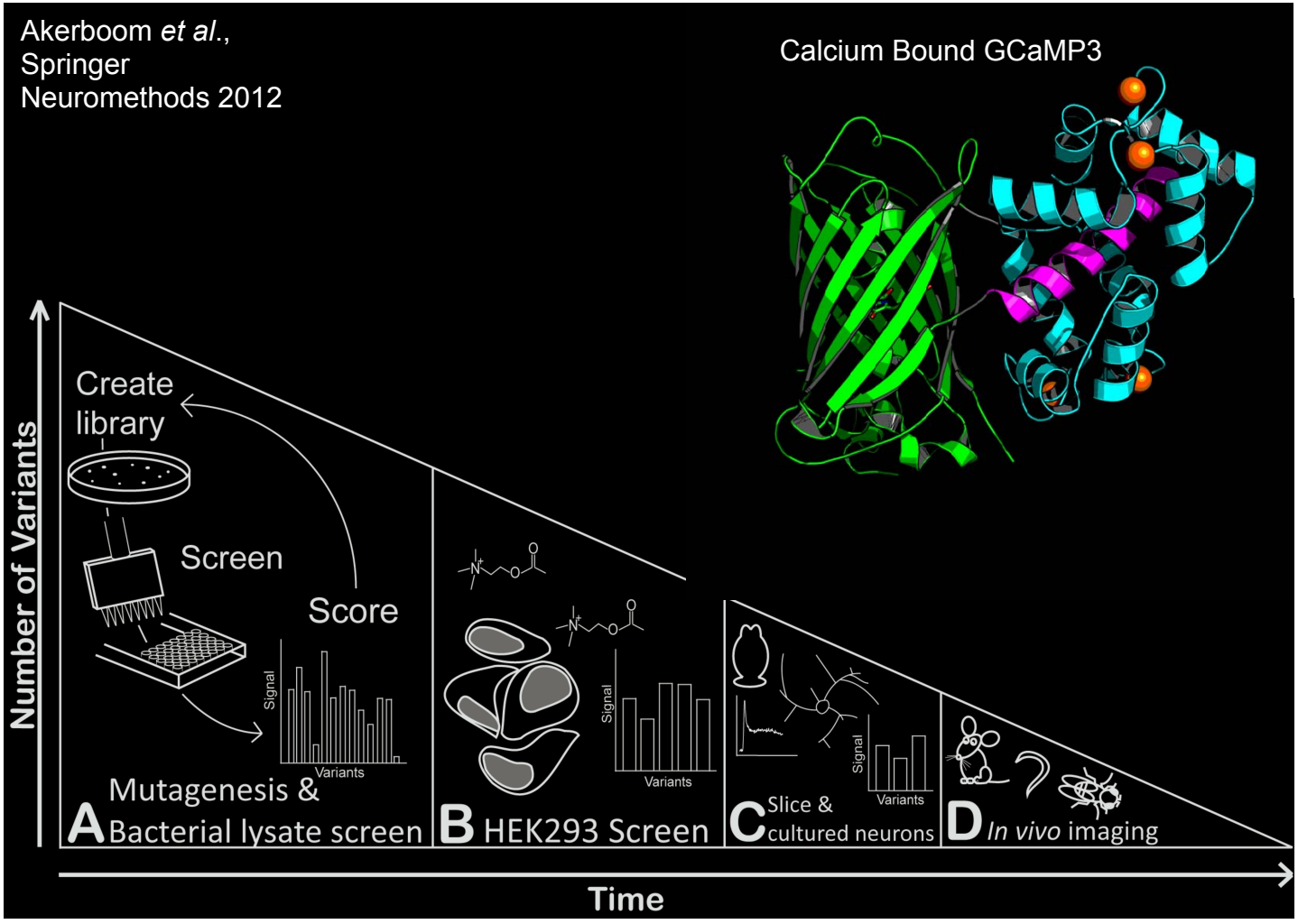
Genetically Encoded Calcium Indicator (GECI) Proje



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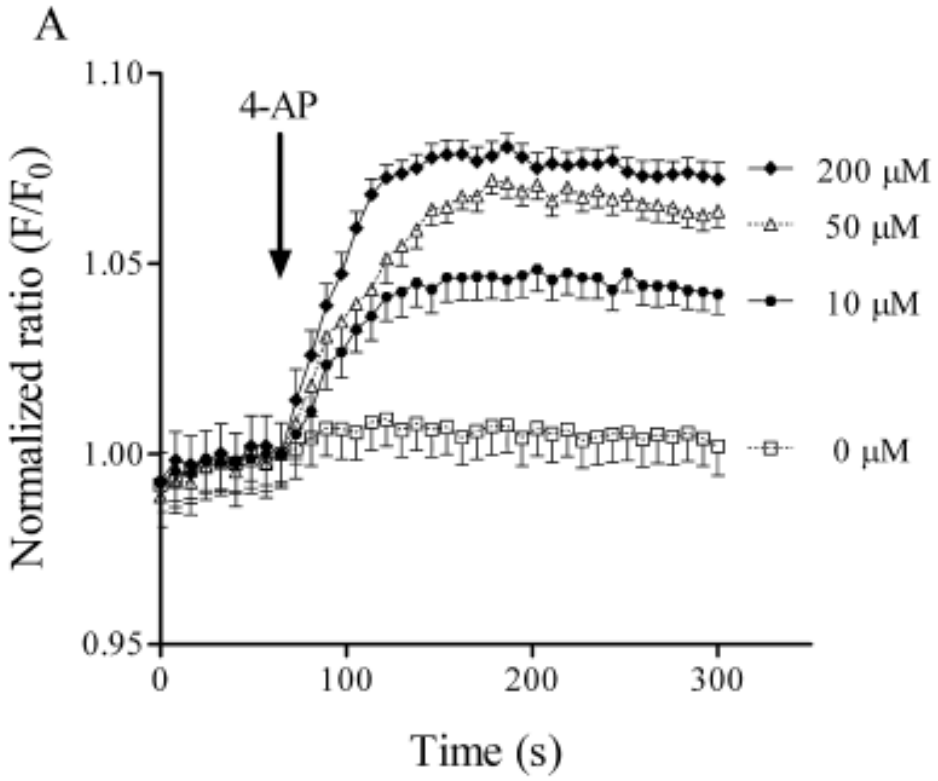
K+-Channel Openers Suppress Epileptiform Activities Induced by 4-Aminopyridine in Cultured Rat Hippocampal Neurons

Na+ indicator (SBFI), ex340/380, em540



J Pharmacol Sci 108, 517 – 528 (2008)

Eisai

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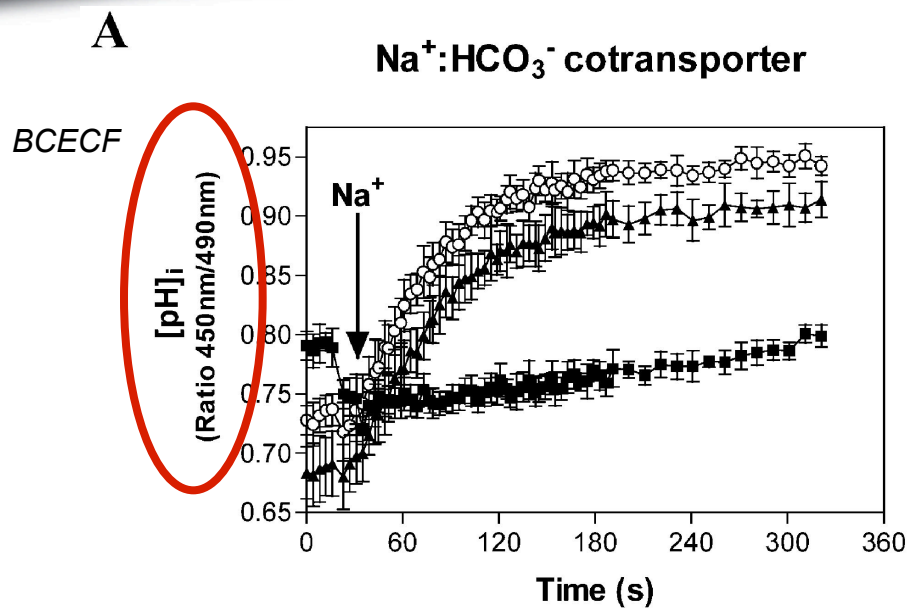
New sodium dye_ANG-2

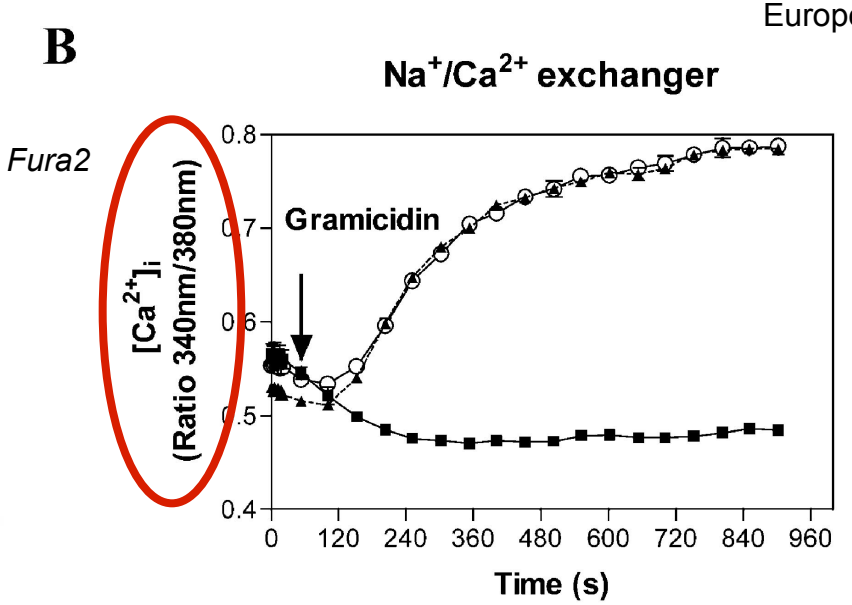
	SBFI	ANG1/ANG2
K_d	4 mM	92 mM/ 20 mM
Excitation	340 and 380 nm	488 to 517 nm
Emission	500 nm	540 nm
Brightness	Dim	Very Bright
Dynamic Range (F_{max}/F_{min})	<3	29
AM ester loading	Difficult	Easy
Photobleaching	Sensitive	Resistant

www.teflabs.com

Potent and selective inhibition of the human Na $^{+}$ /H^{+} exchanger isoform HE1



European Journal of Pharmacology 420(2001) 1–8



Takeda

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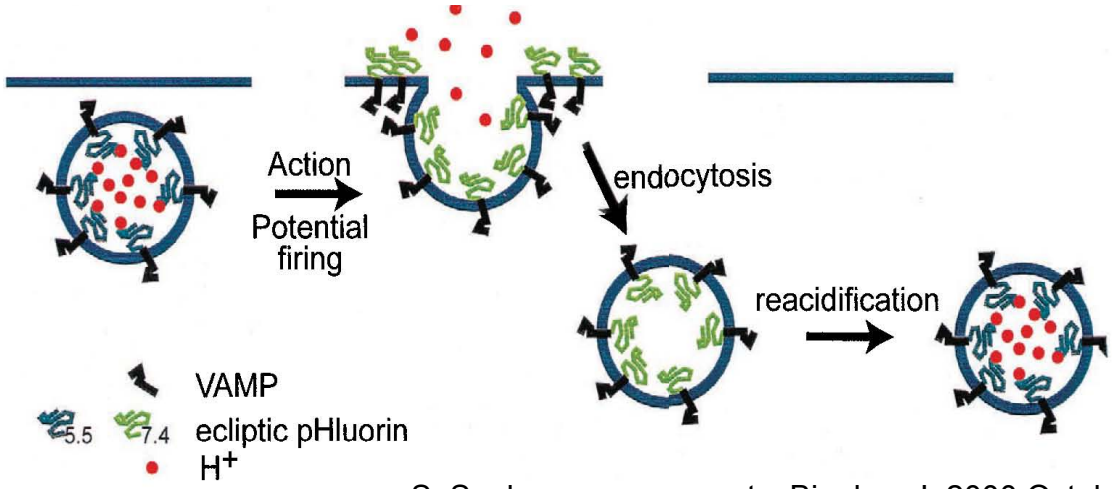
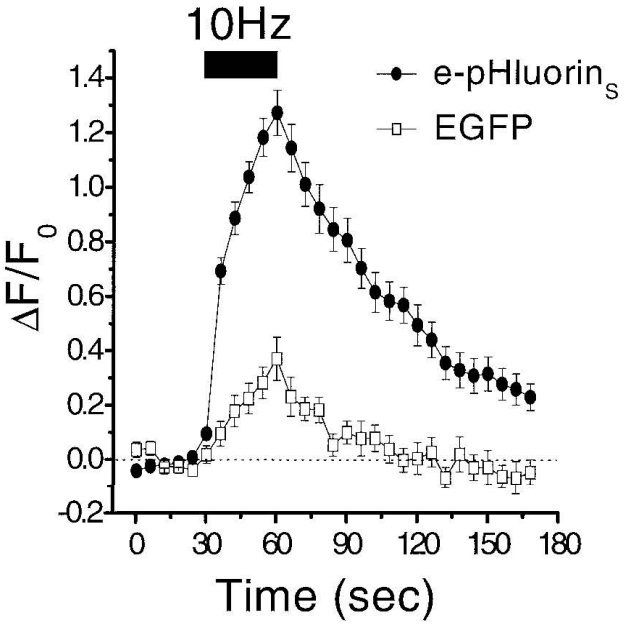
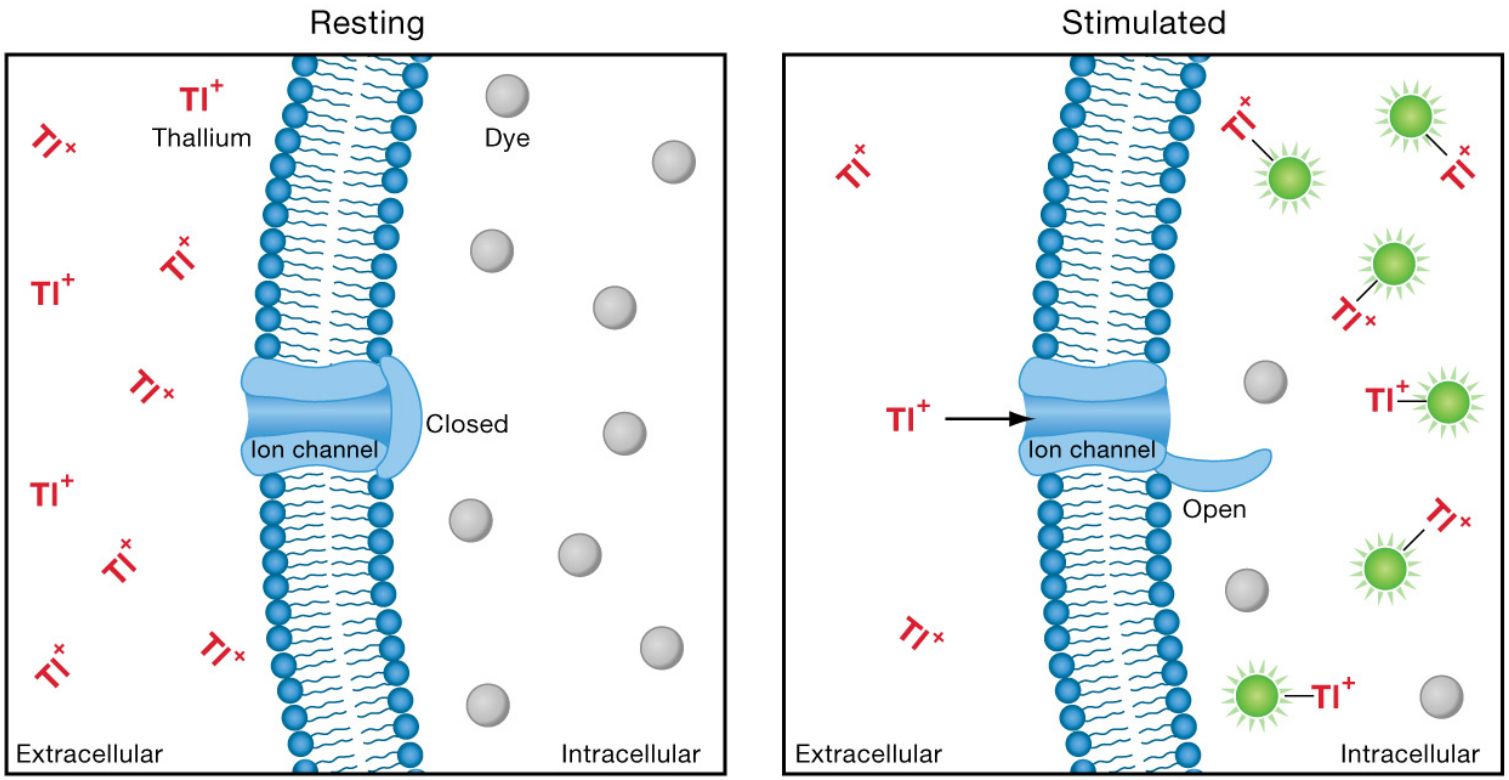
The Use of pHluorins for Optical Measurements of Presynaptic Activity



S. Sankaranarayanan etc, Biophys J. 2000 October; 79(4): 2199–2208.



Tl^+ assay for potassium chanels



Tl+ can permeate K channels and be detected by Tl+-sensitive dyes

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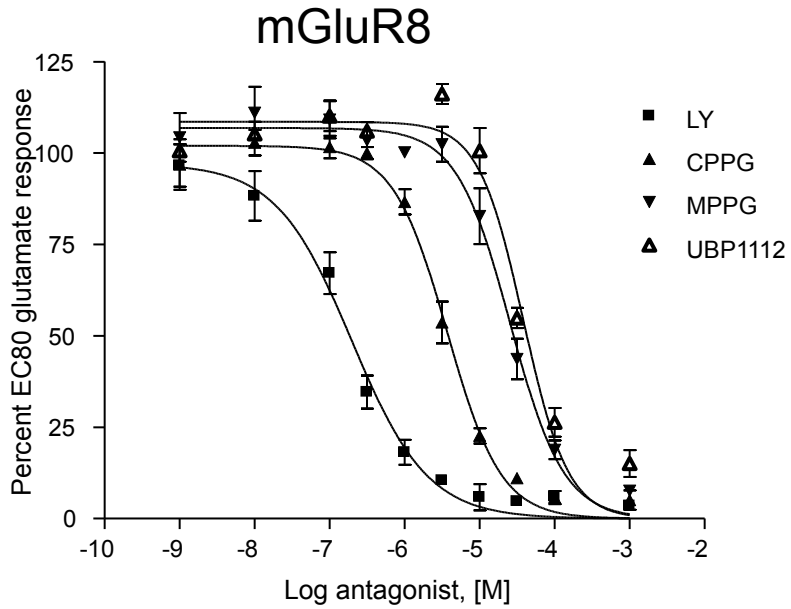
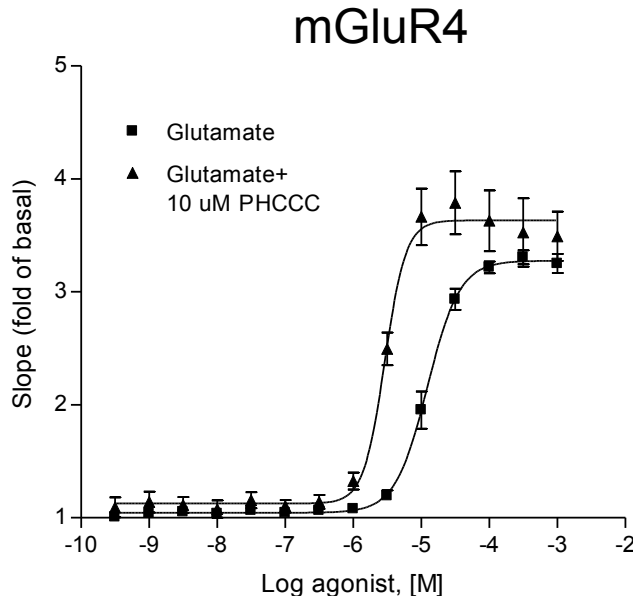
"GIRK" Assay for mGluRs





- HTS-compatible functional assays for $G_{i/o}$-coupled mGluRs has been challenging
- GIRK assay has enabled rapid development of quantitative, HTS-compatible assays of mGluR 2, 3, 4, 7, and 8
- Detection of agonists, antagonists and potentiators has been enabled

VANDERBILT UNIVERSITY

***Mol Pharmacol* 73:1213–1224, 2008**

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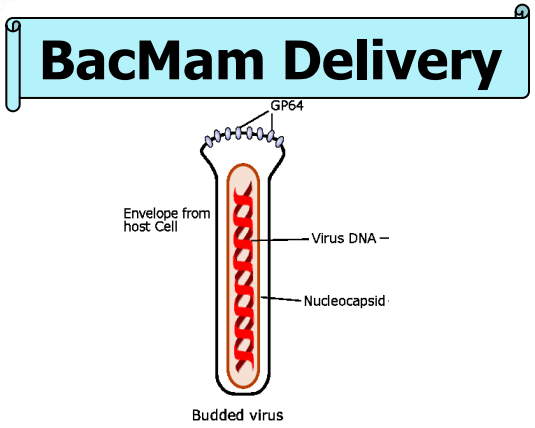
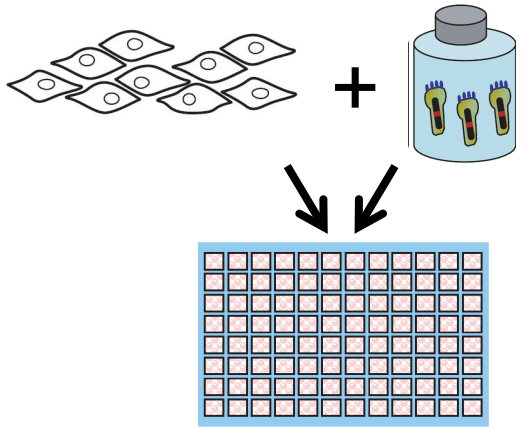
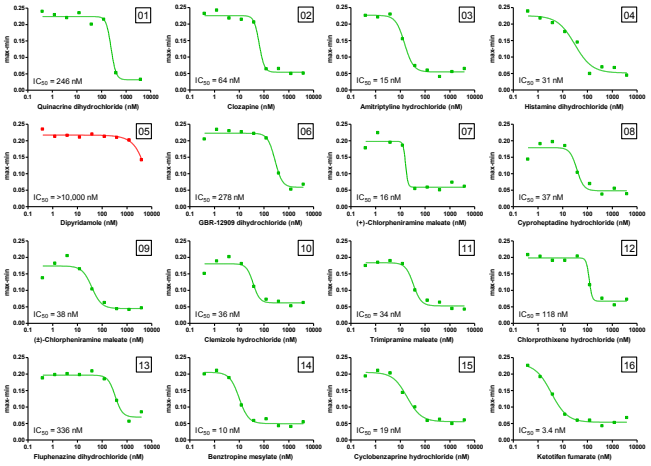
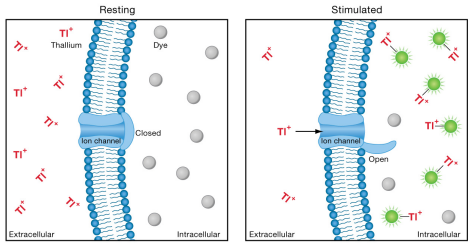
BacMam-hERG Expression/ FluxOR™









invitrogen™

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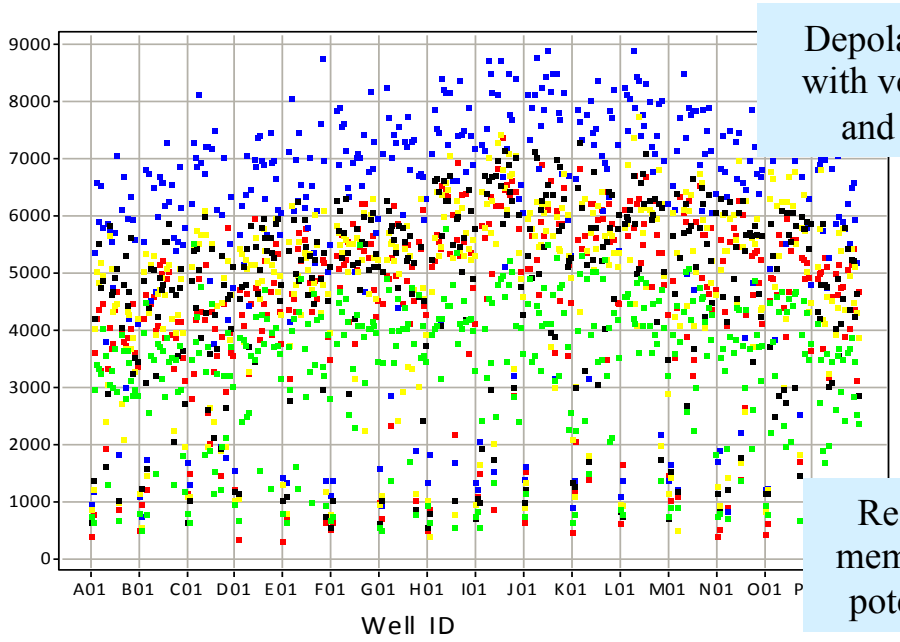
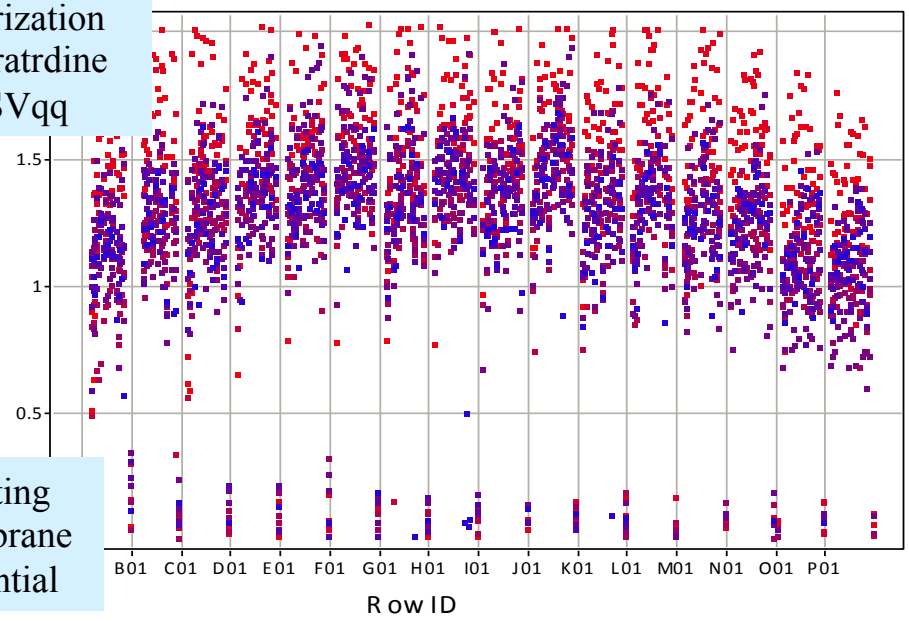
Sodium Channel Depolarization

FMP on FLIPR



Z' factor = 0.39

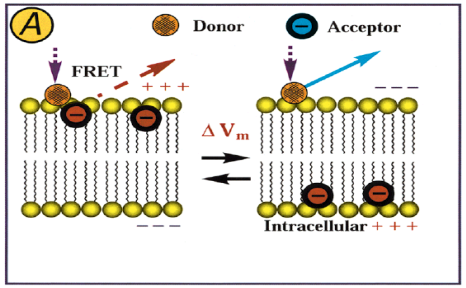
VSP on FDSS



Z' factor = 0.54

Depolarization with veratrdine and SVqq

Resting membrane potential



AstraZeneca

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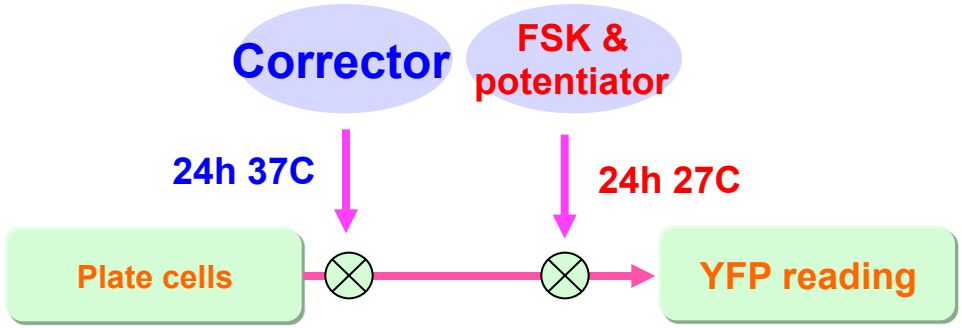
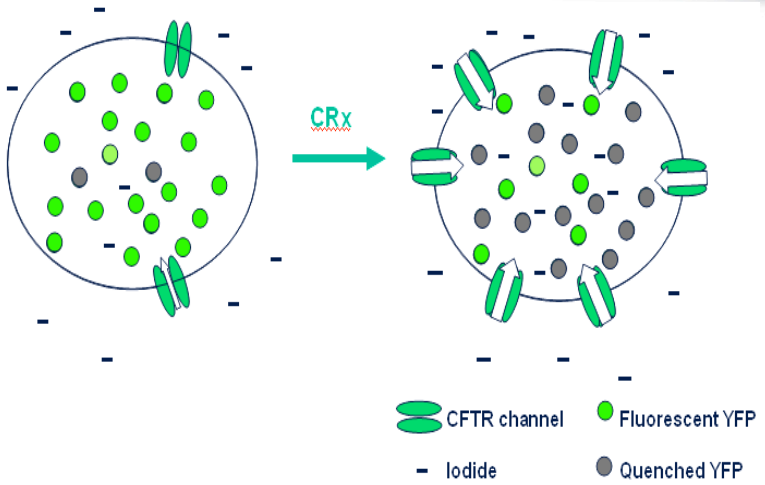
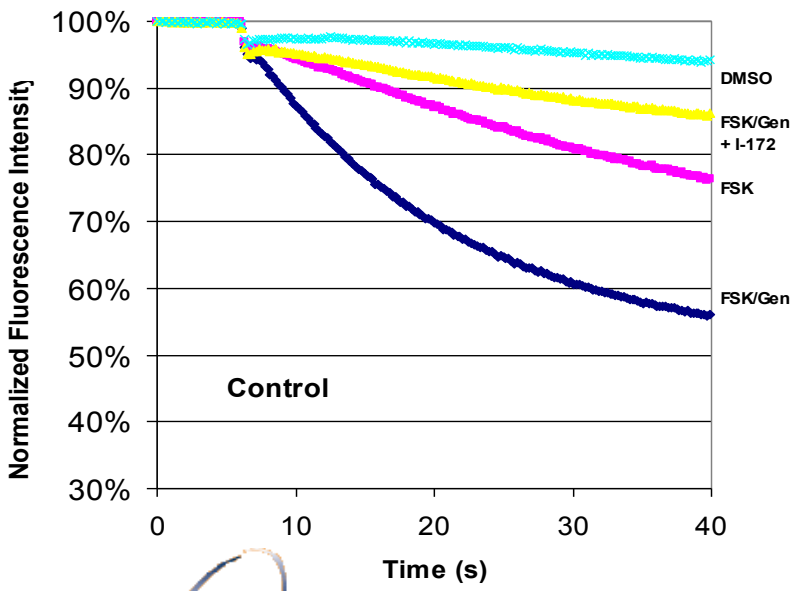
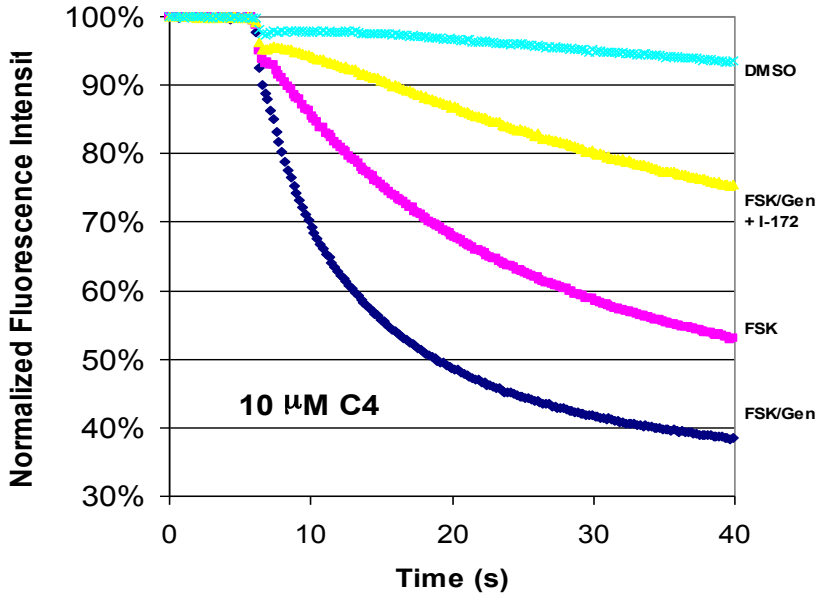
YFP Assay to Identify Modulators of CFTR-ΔF508









CombinatoRx

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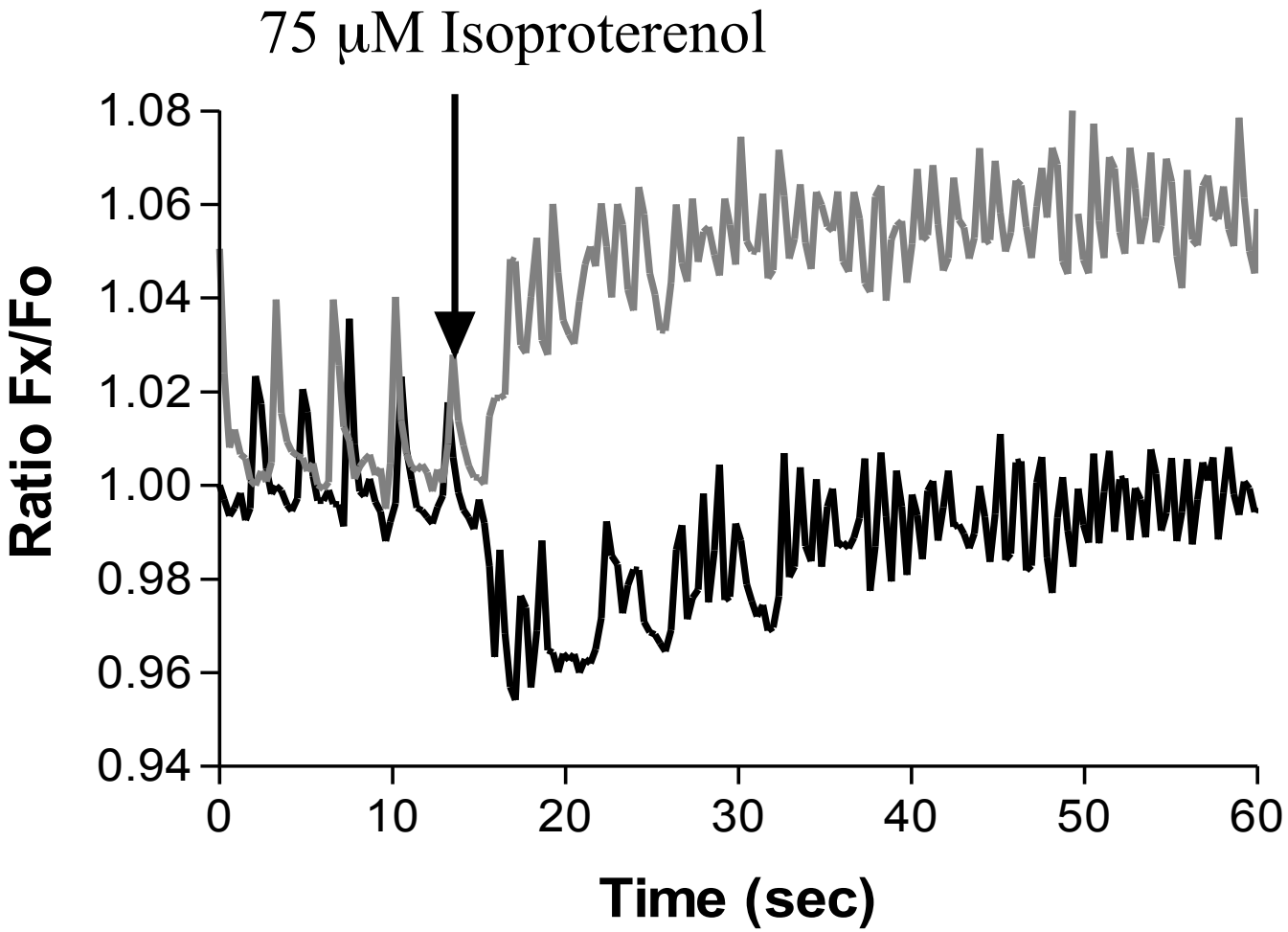
Calcium Oscillation in heart muscle cells



Johnson & Johnson

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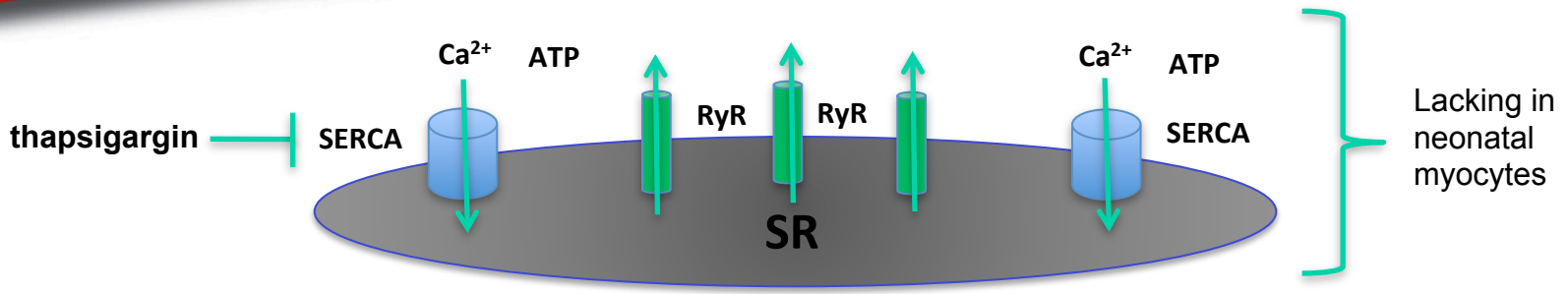
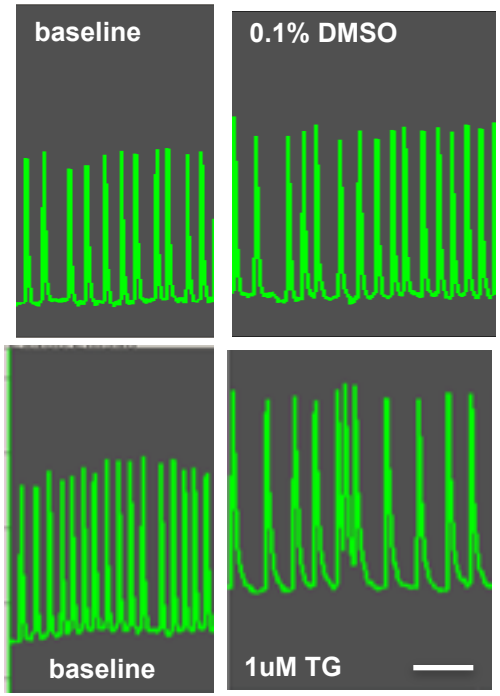
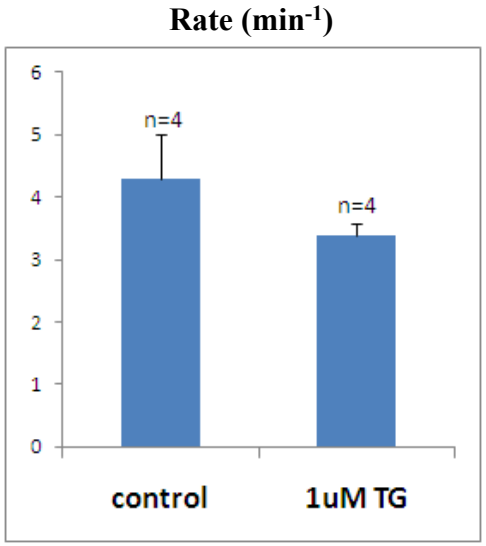
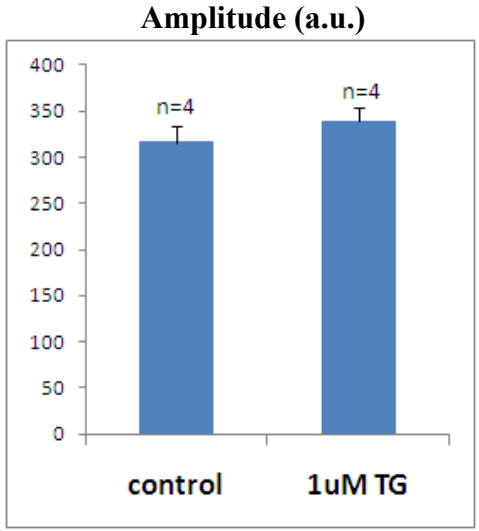
Characterizing the phenotype of iPS cardiomyocytes









Decay

Baseline: τ = 0.93s (n=4)

TG: τ = 1.97s (n=4; p<0.005)

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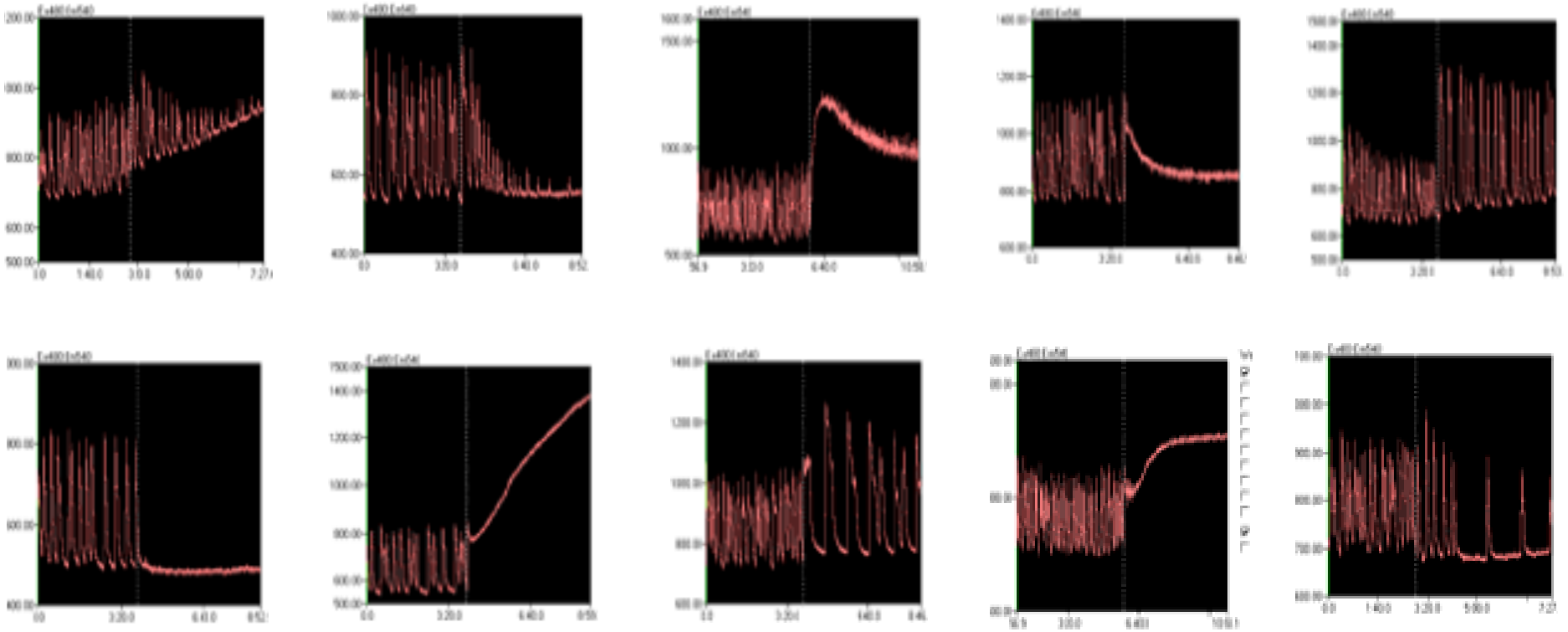
Low Mg^{2+}-induced synchronized repetitive calcium oscillation in cultured neurons

40 ref & 28,000 cmpds @ 10 µM

150 cmpds selected for acute *in vivo* antiepileptic effect (MES @ 30 mg/kg ip Mouse)



sanofi aventis
L'essentiel c'est la santé.

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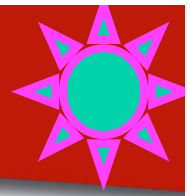
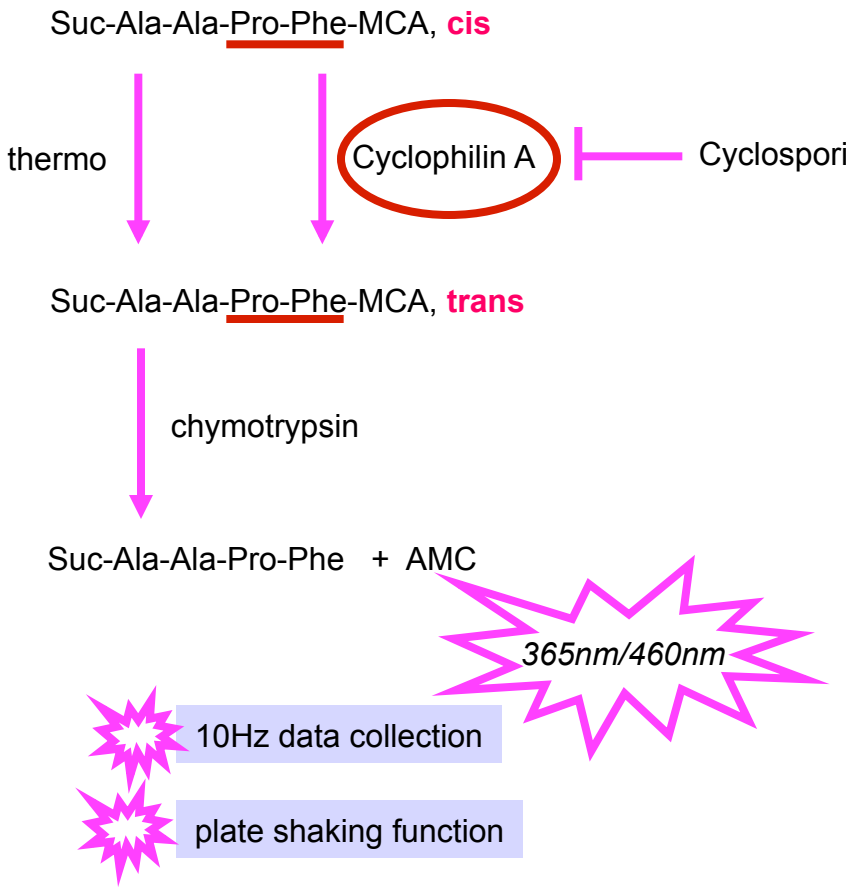
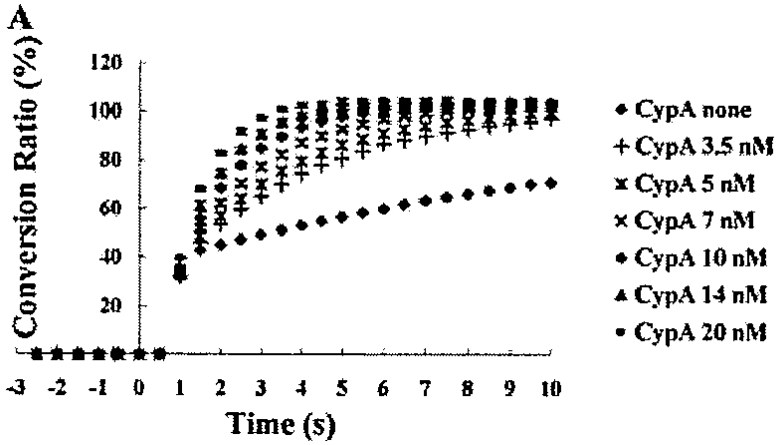
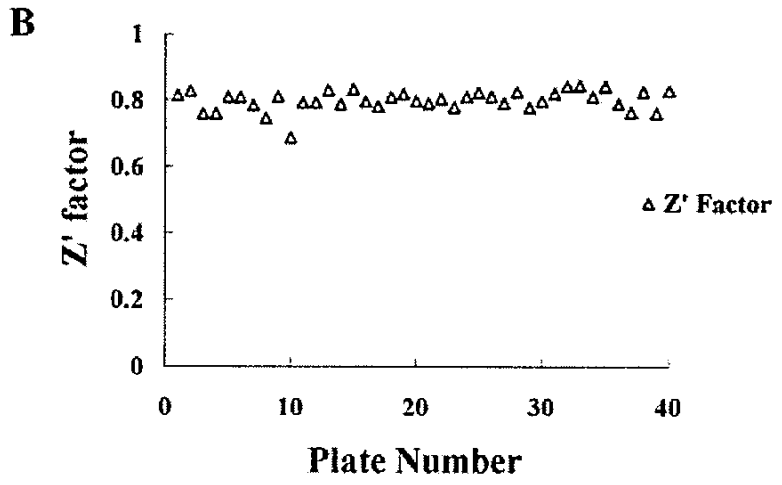
HTS to identify Prolyl Isomerase Inhibitors









Journal of Biomolecular Screening. 14(4) p419-422. 2009

Mitsubishi Tanabe Pharma

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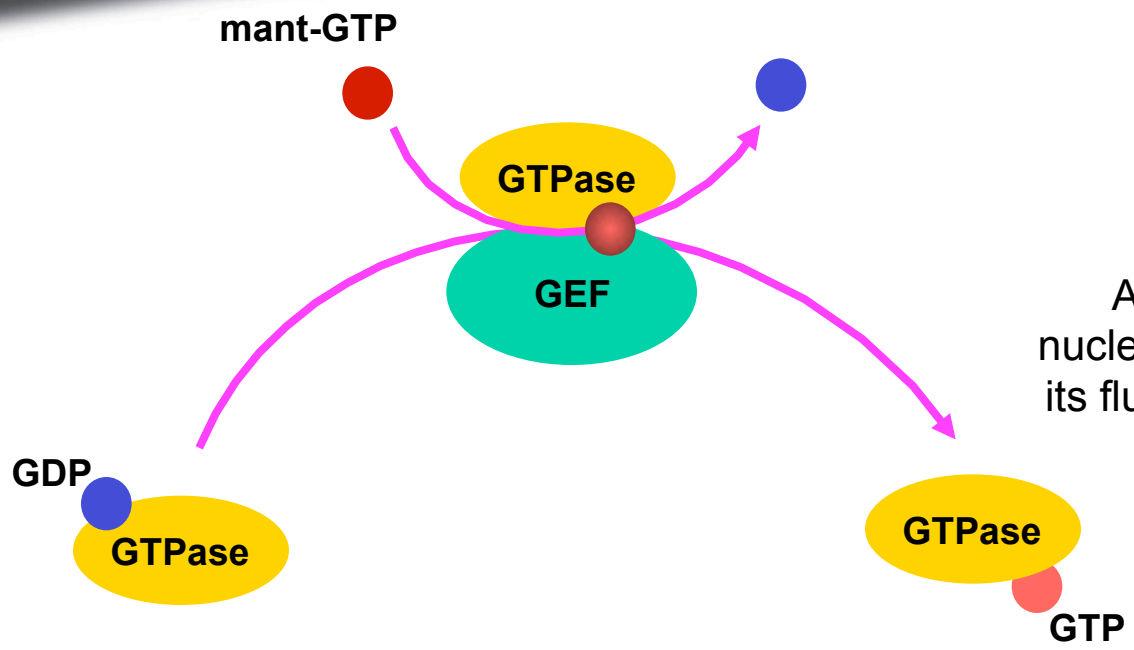
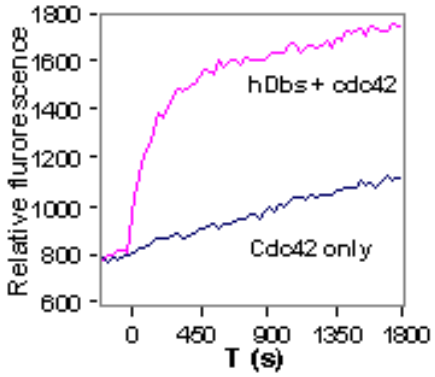
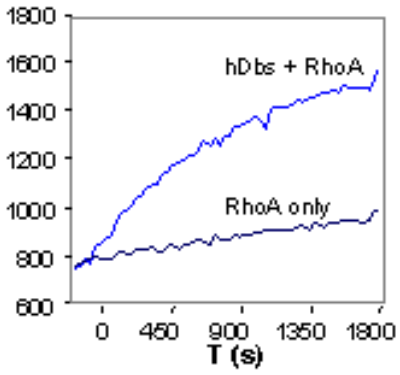
HTS to identify Small GTPase Inhibitors

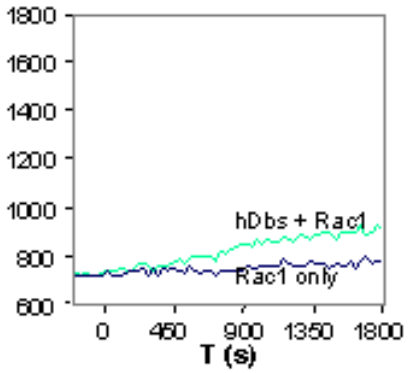


360nm/440nm

As mant-GTP gets bound in the nucleotide binding pocket of a GTPase, its fluorescence increases dramatically







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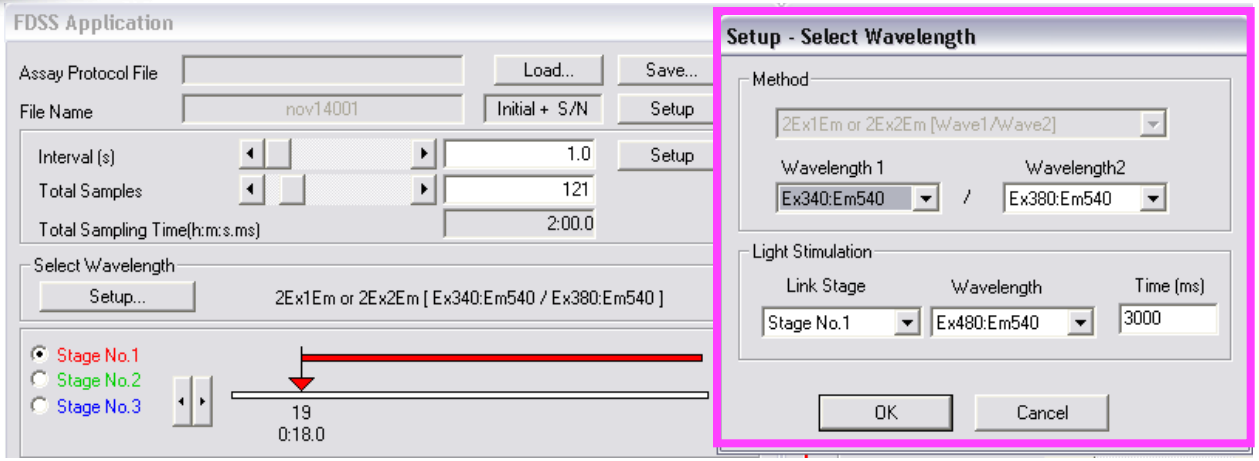
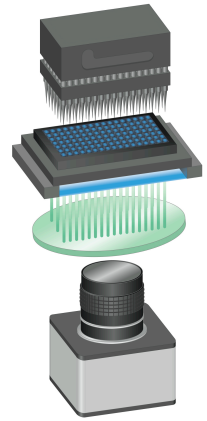
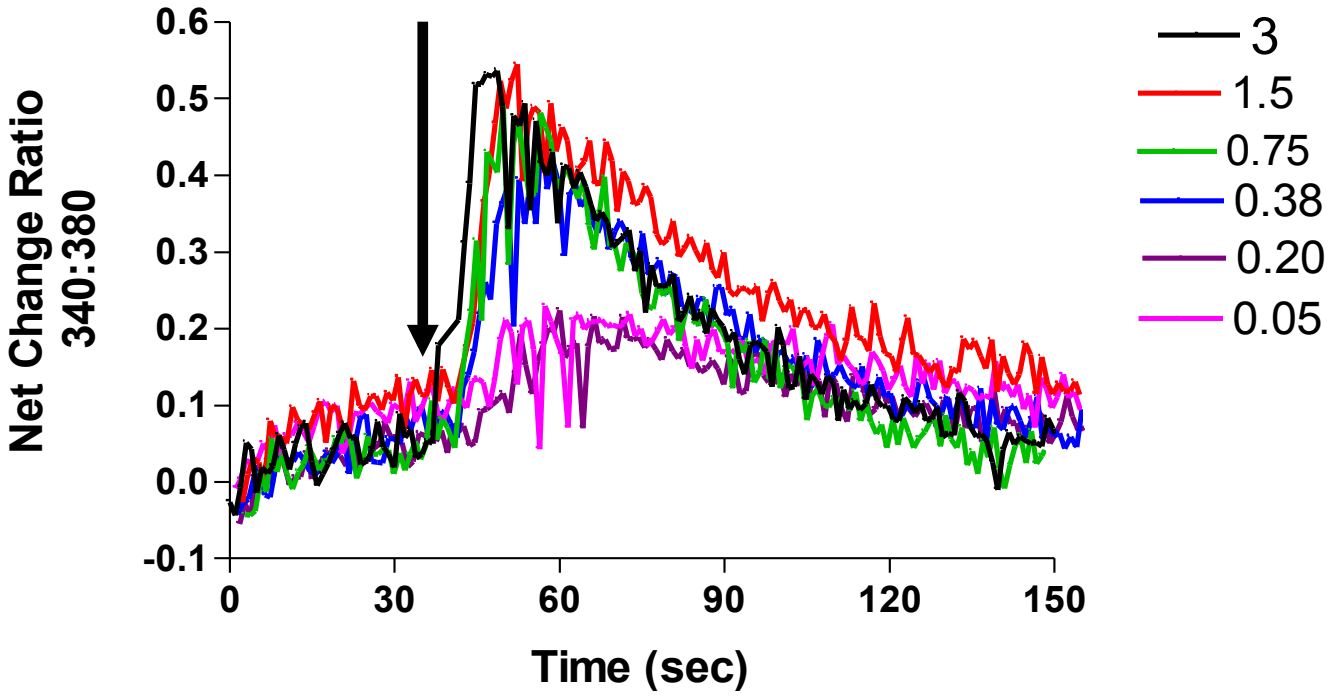
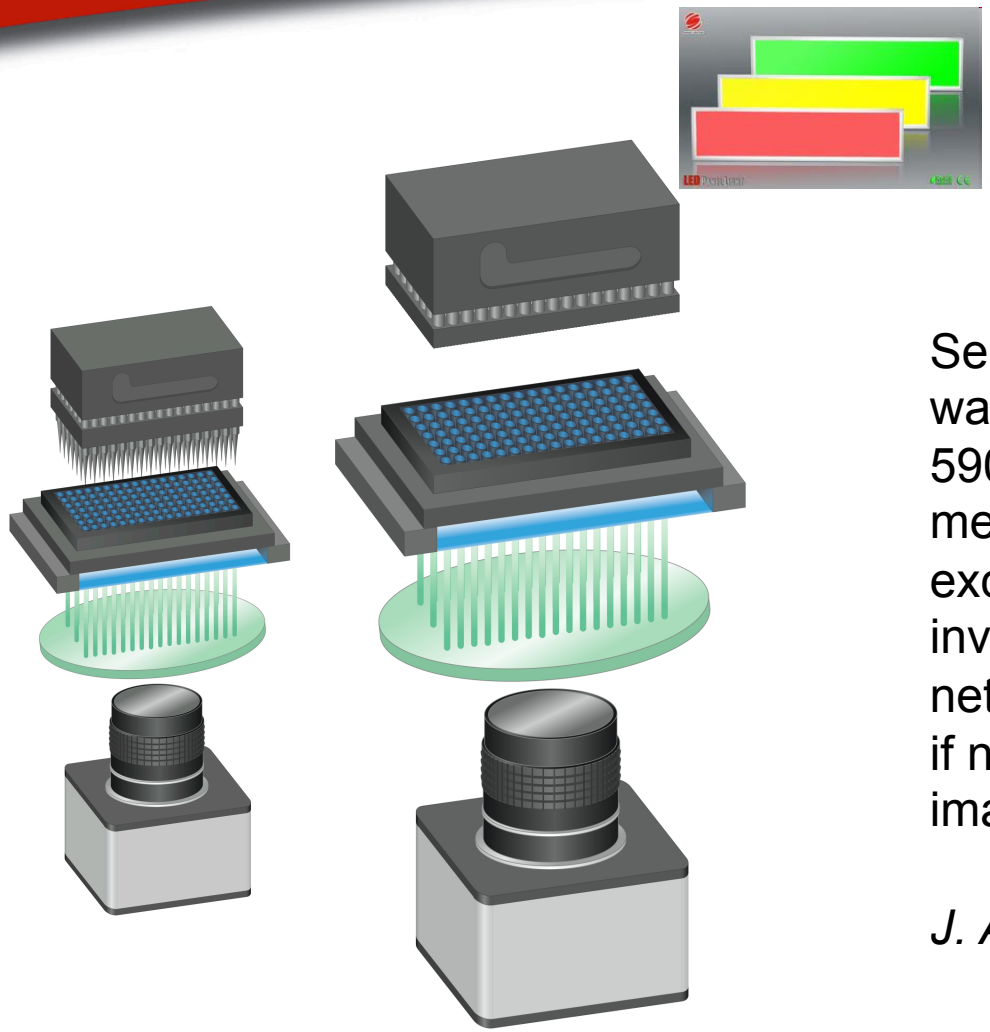
Light as a GPCR agonist in HTS







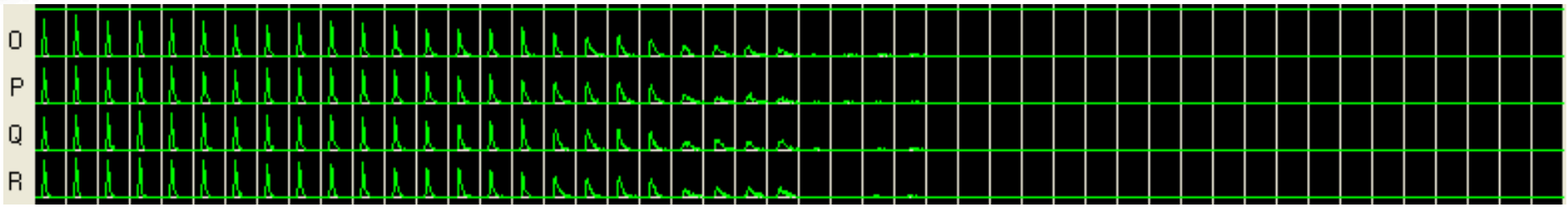
Flat panel of LED to stimulate reaction

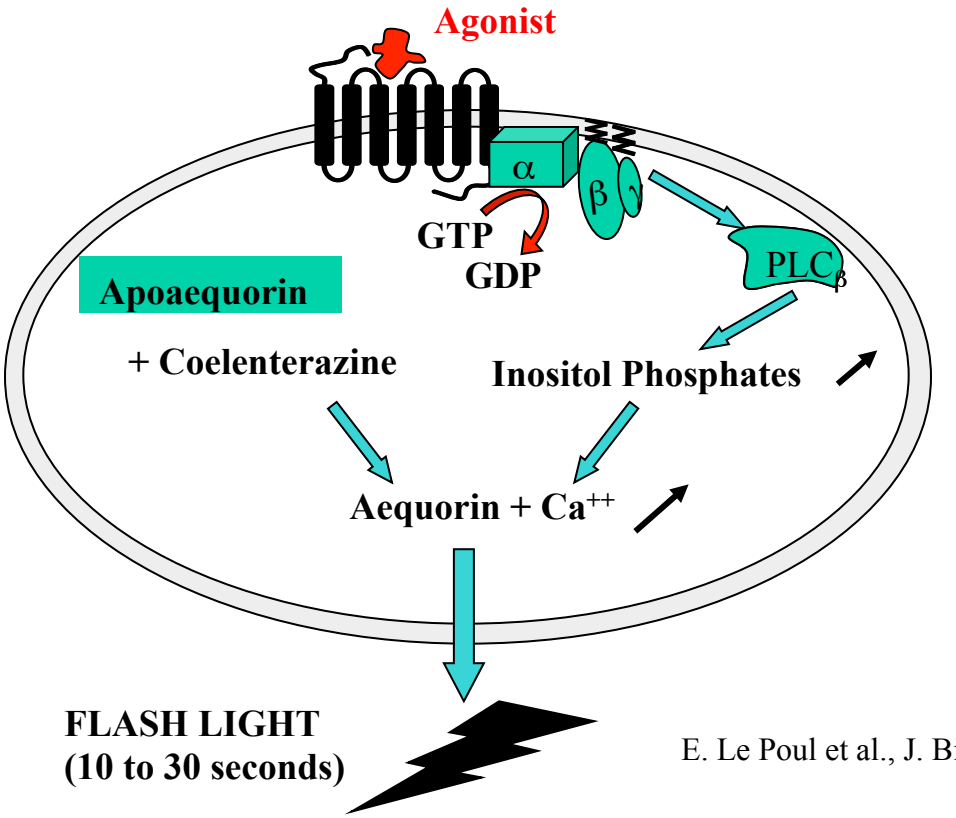


Separating the excitation wavelengths 470nm (for ChR2) and 590nm (for RCaMP) allowed Ca2+ measurements in the BWMs without excitation of ChR2. ……. to investigate cell-cell interactions and network function in live animals, even if no behavior is evoked, on a simple imaging setup.

J. Akeroom, HHMI Janelia Farm

Aequorin-based Functional Assay for GPCR





E. Le Poul et al., J. Biomol. Screening 2002; 7(1) 57-66

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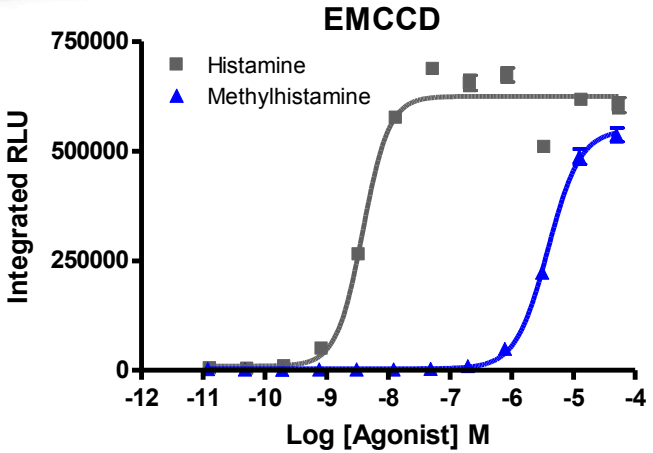
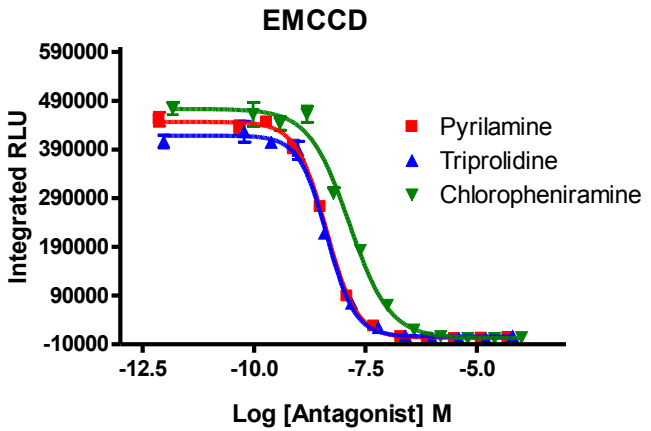
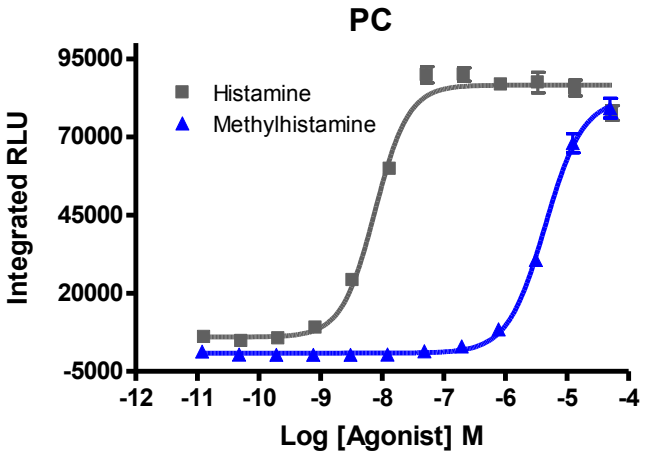
BacMam Aequorin by PC and ImagEM



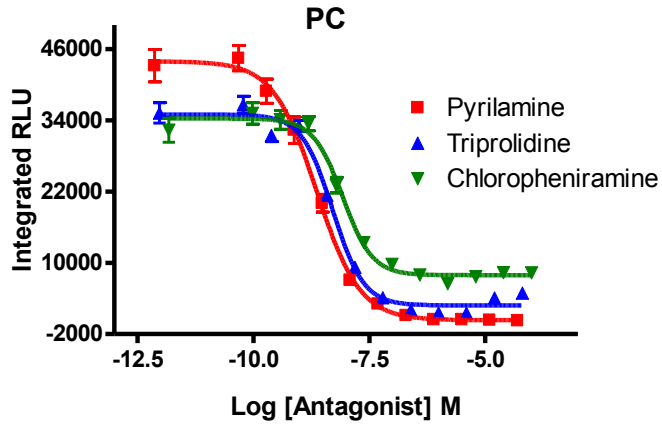
	Histamine	Methylhistamine
EC50	3.8659e-009	3.8809e-006



	Pyrilamine	Triprolidine	Chloropheniramine
EC50	4.1970e-009	4.3479e-009	1.3801e-008



	Histamine	Methylhistamine
EC50	7.6494e-009	4.4401e-006



	Pyrilamine	Triprolidine	Chloropheniramine
EC50	2.3087e-009	5.1425e-009	8.4570e-009

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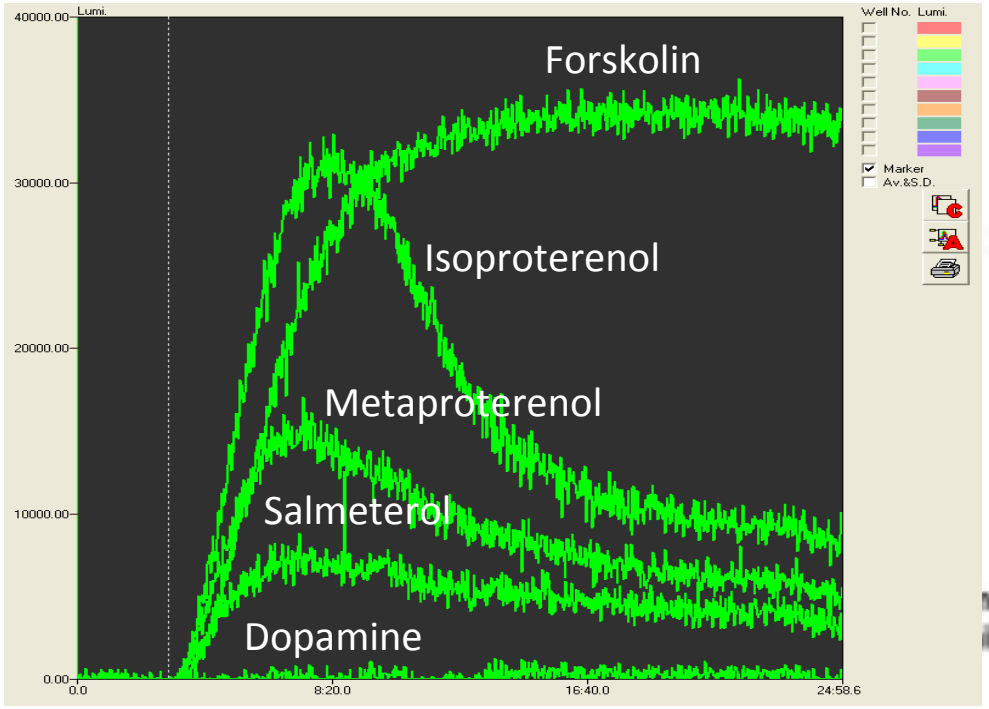
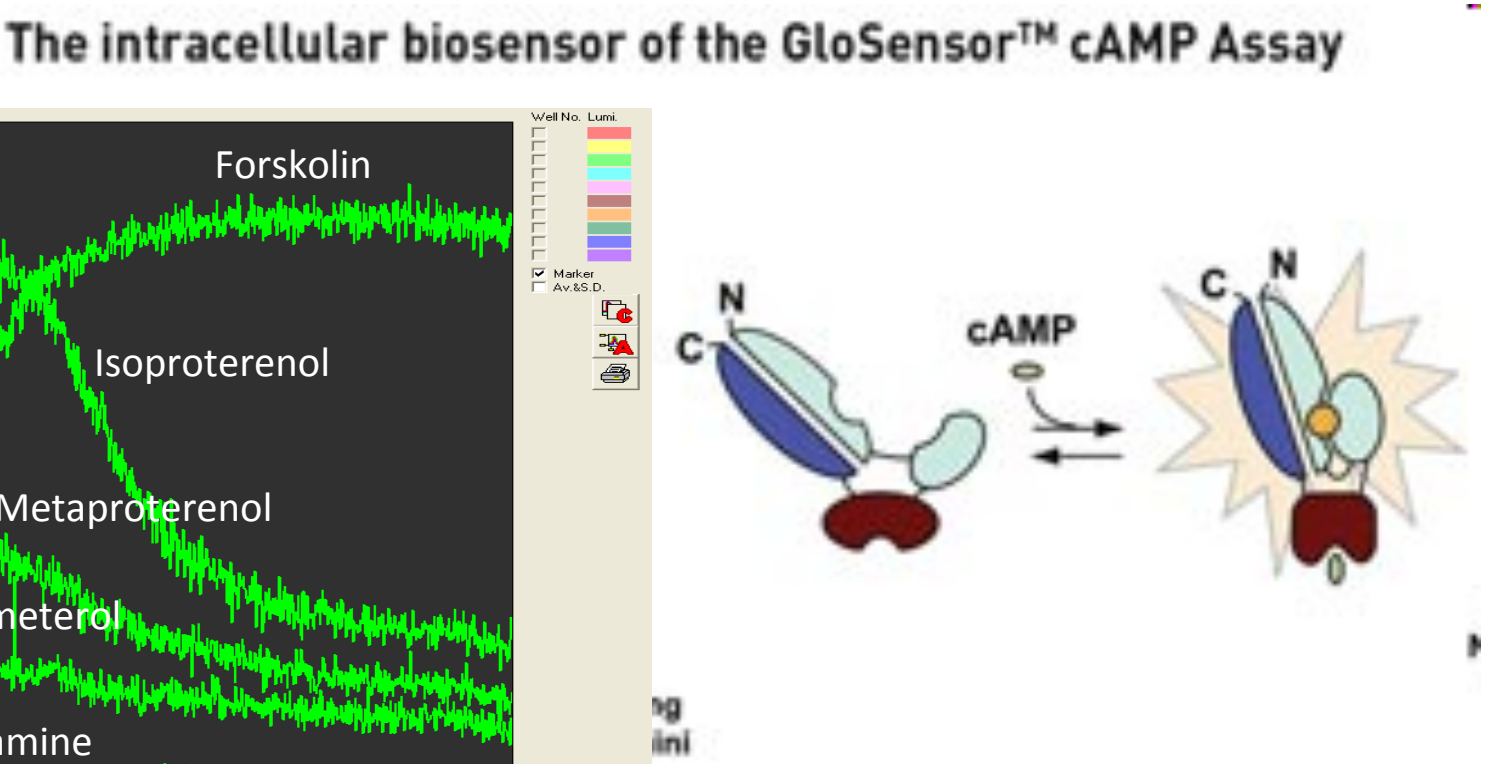
Kinetically Analysis of Endogenous b2AR Full and Partial Agonists in HEK293 cAMP GloSensor Cell Line





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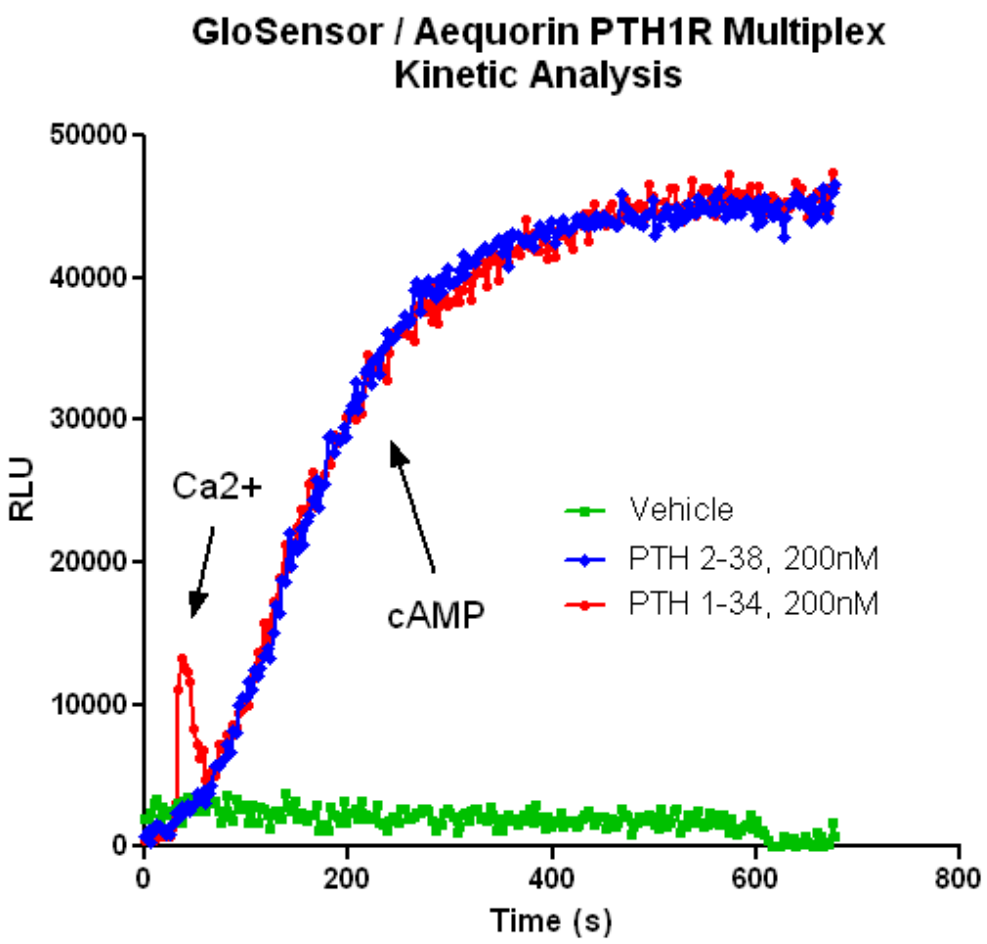
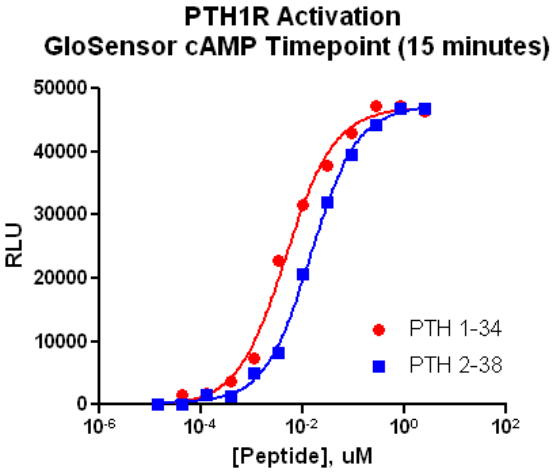
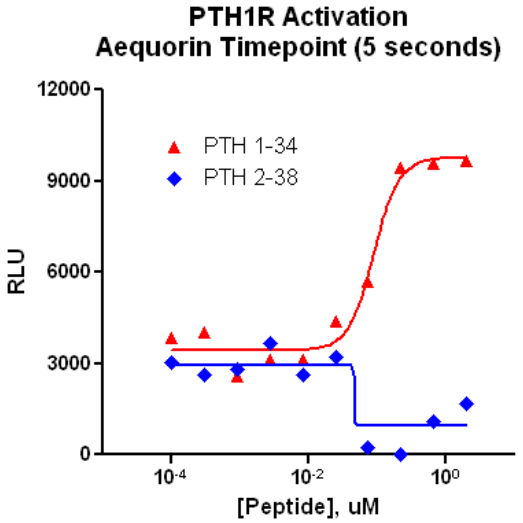
Multiplexed Analysis of Second Messenger Signaling in Live Cells







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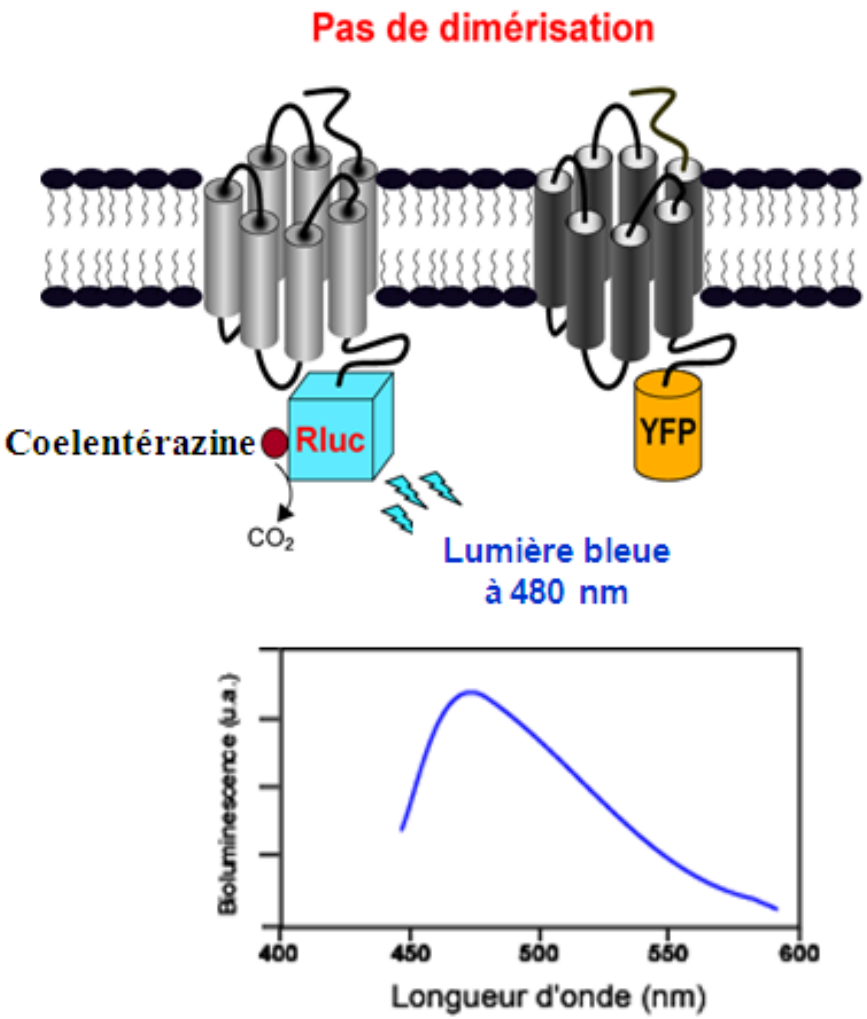
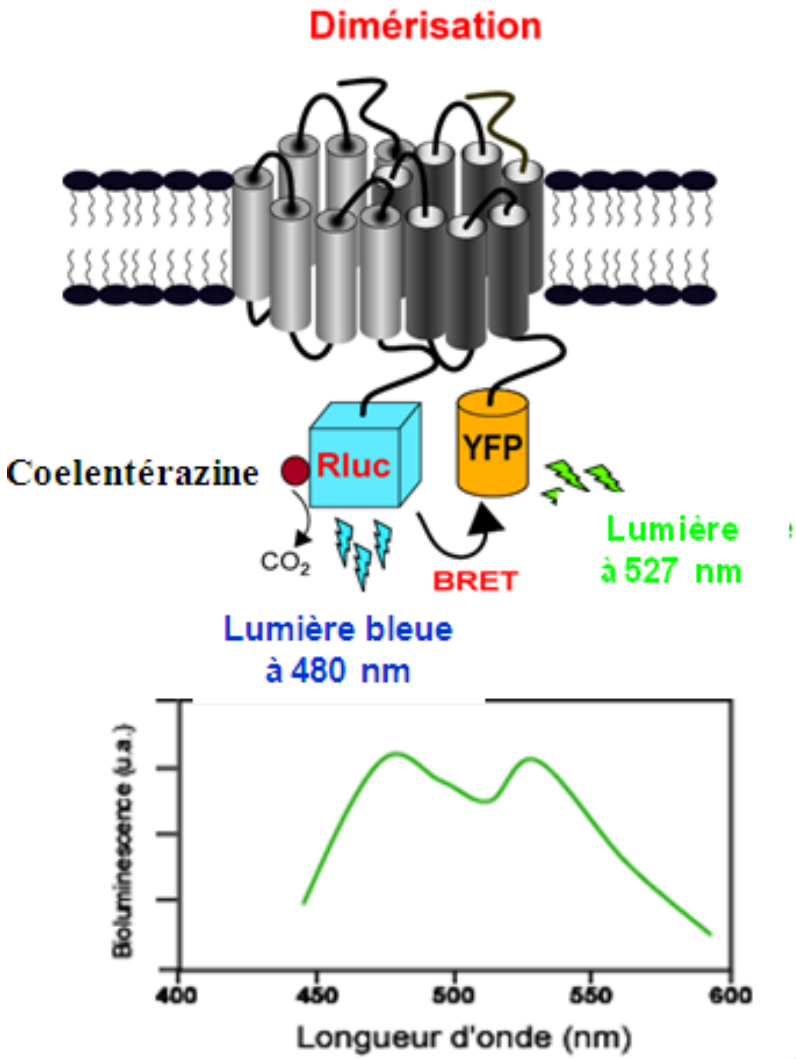
BRET: dimmerization of receptor





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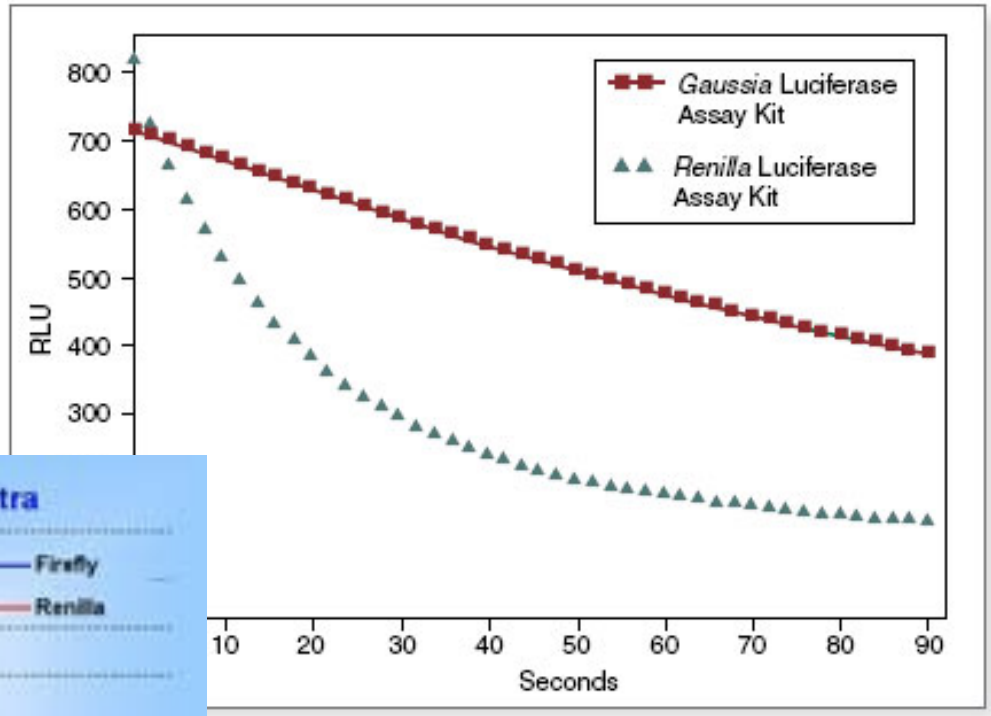
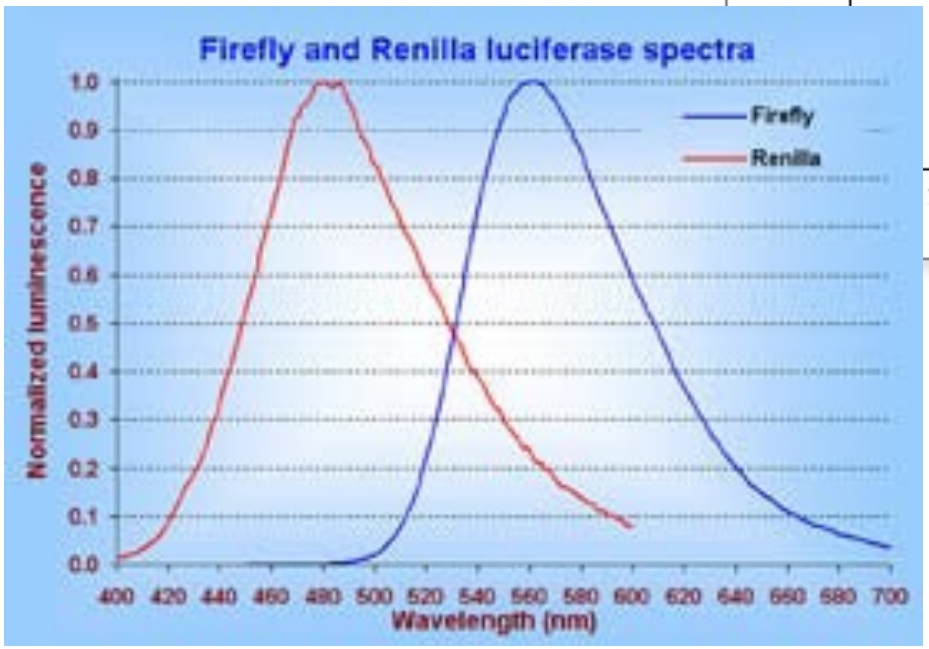
Luciferase





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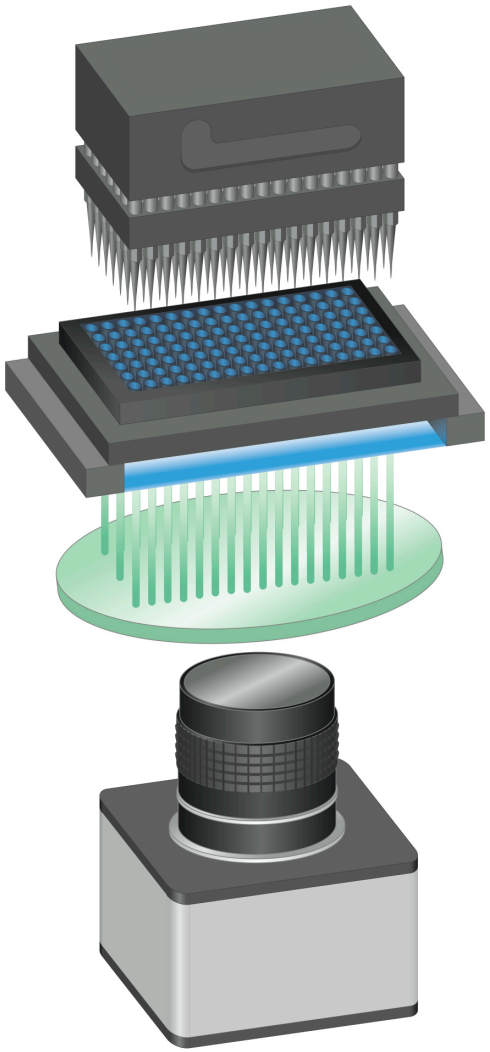
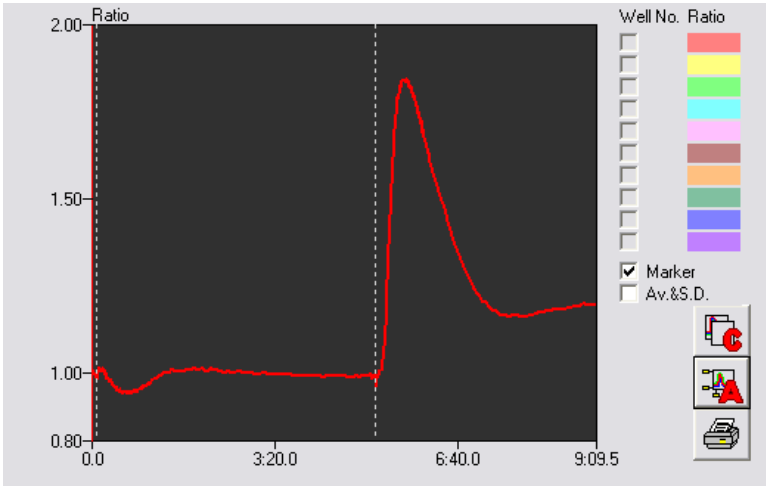
What does Hamamatsu FDSS do?



Add

384 well s at a time



Read

fluorescence & luminescence

0.01Hz (100s) to 40Hz (25ms)

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World of FDSS _ US and Europe