



HTS of Ca²⁺ Transients in Human iPS-derived Cardiomyocytes as a Predictive and Cost Effective Assay Early on in Drug Development



Content

- Introduction into the production of Cor.4U cardiomyocytes
- Overview of established applications with Cor.4U cardiomyocytes
- HTS calcium transient assay in the Hamamatsu FDSS/ μ Cell
 - Compound screening
 - Data analysis
- Outlook



Generation of Cor.4U human iPS derived Cardiomyocytes

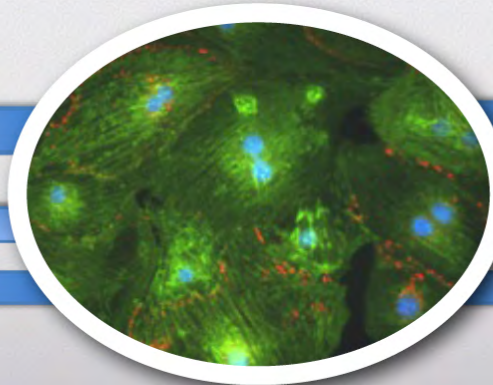
- iPS generated according to Yamanaka (licensed from iPS Academia)
- Production system by Axiogenesis enables large lot sizes
- Tightly controlled differentiation results in minimal lot to lot variations
- Selection based purification technology results in pure cardiomyocytes
- Cryopreserved in various formats
- GFP positive and colourless varieties will be available
- Complete FTO for commercial use on the limited use label license
- Cryopreserved
- Fresh cultures on different substrates (cell culture flasks, 96/384 well plates)

Applications of Human Cor.4U Cardiomyocytes

Automated Patch Clamp

MEA

Human iPS-derived
Cor.4U Cardiomyocytes



Immunostaining of Cor.At Cardiomyocytes:
cardiac actinin and connexin 43; nuclei

Manual Patch
Clamp

Impedance-based
Assay Systems

Fluorescent
Plate Reader
Assays

Mito- and Cytotox
Assays



Introduction

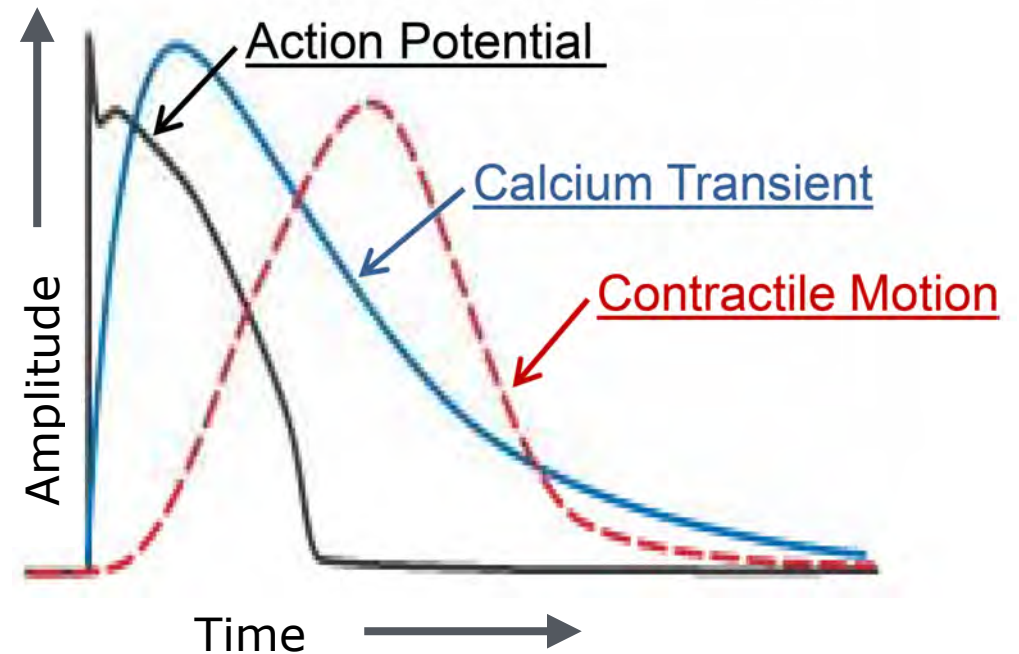
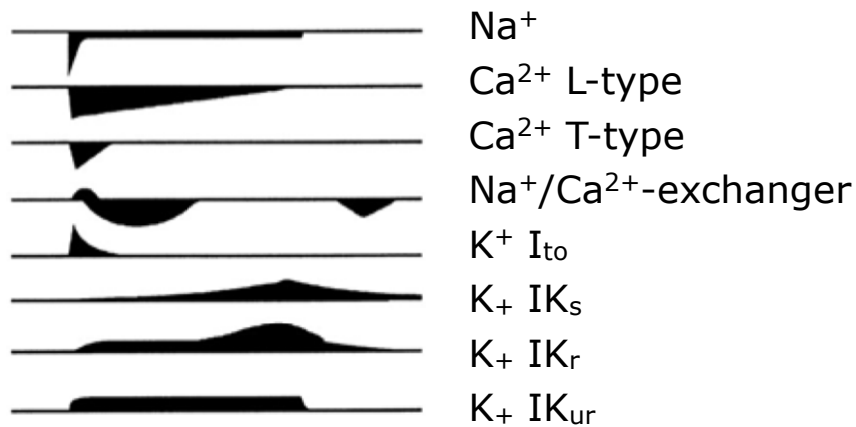
Recording of Calcium Transients in Cor.4U Cardiomyocytes

Excitation-Contraction Coupling

Action Potential



Currents

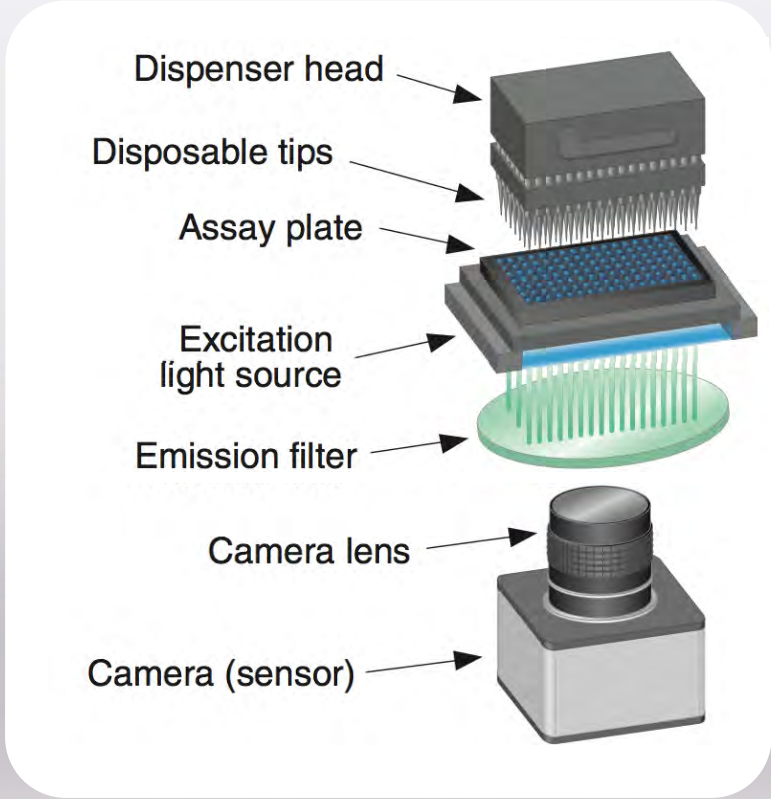


Many Channel Types contribute to the Action Potential

Calcium is the messenger that integrates the electrochemical signals of the action potential with the molecular signaling pathways that regulate contraction

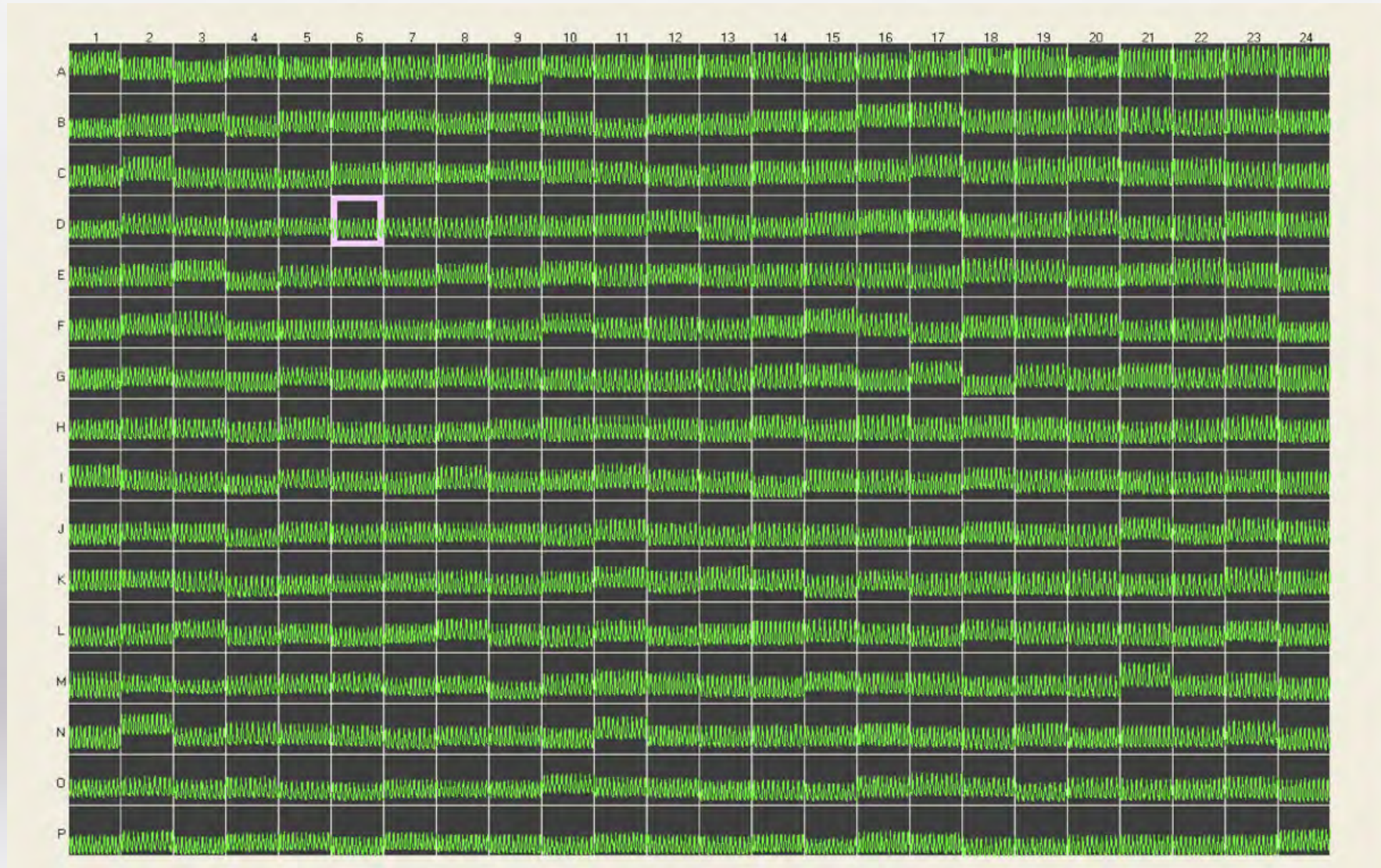


Hamamatsu FDSS/ μ Cell



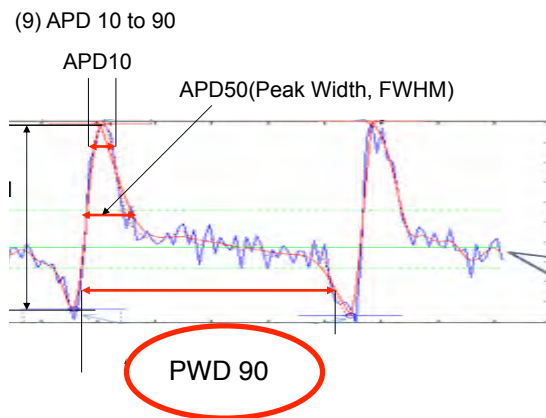
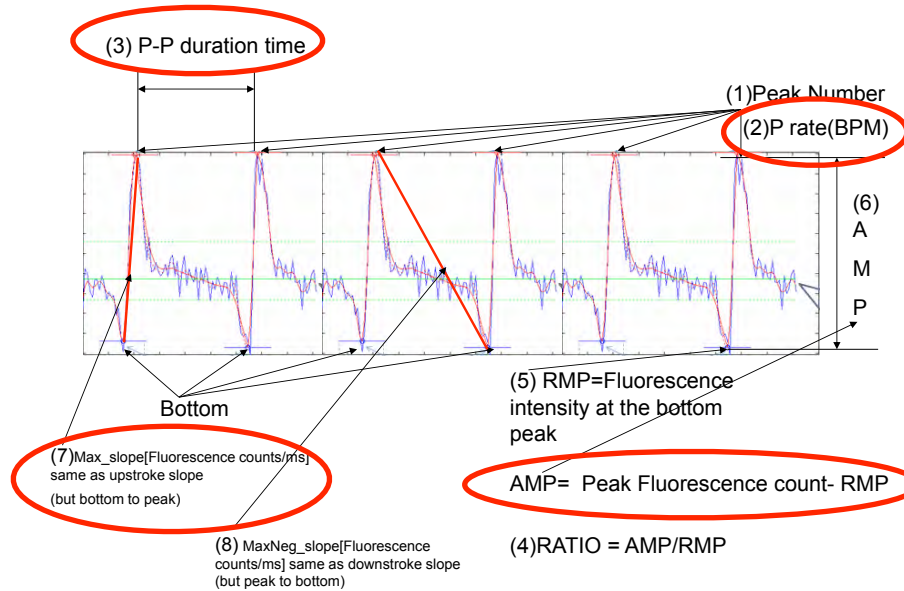
Plating Efficiency on 384 Well Plates

Fluo-4 Assay



Data was kindly provided by Dr. Thomas Licher, Sanofi Germany

FDSS Parameters Analysed by the CaDio/Wave Checker Software



(1)	Peak number (total, BPM)
(2)	P-P time [ms] (Ave, Std, Max, Min)
(3)	Ratio (Ave, Std) Ratio = (AMP+RMP)/RMP
(4)	AMP (Ave, Std)
(5)	RMP (Ave, Std)
(6)	Slope (Ave, Std) Rising Slope: Slope from bottom to peak Falling Slope: Slope from peak to bottom 0% - 10%, 10% - 90%, 20% - 80%, 30% - 70%
(7)	Integration (Ave, Std)
(8) - (16)	PWD (10% - 90%) [ms] (Ave, Std)



hERG/ I_{Kr} blocker

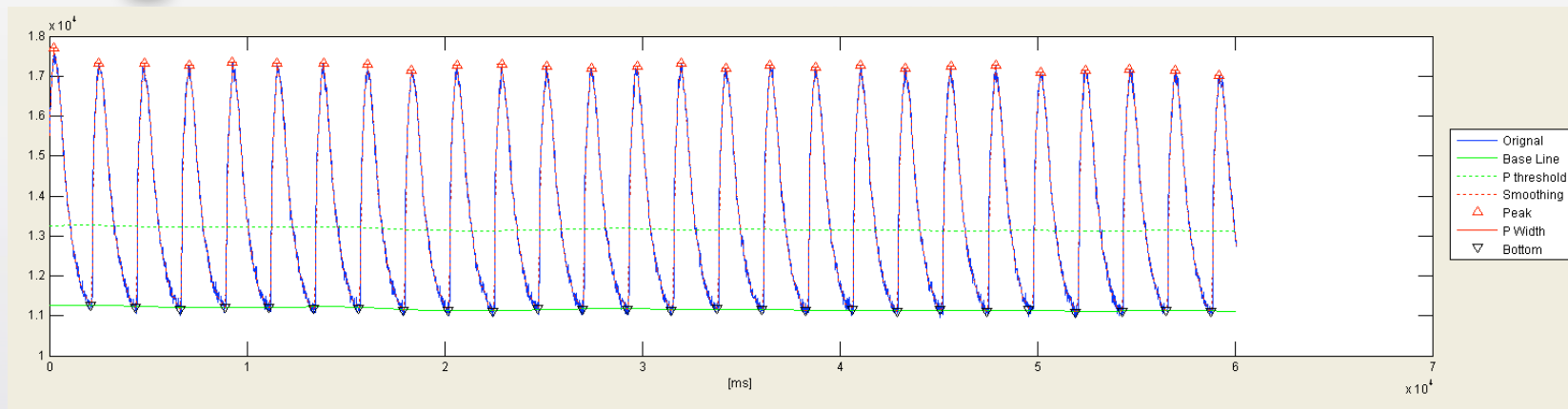


Astemizole
hERG Blocker

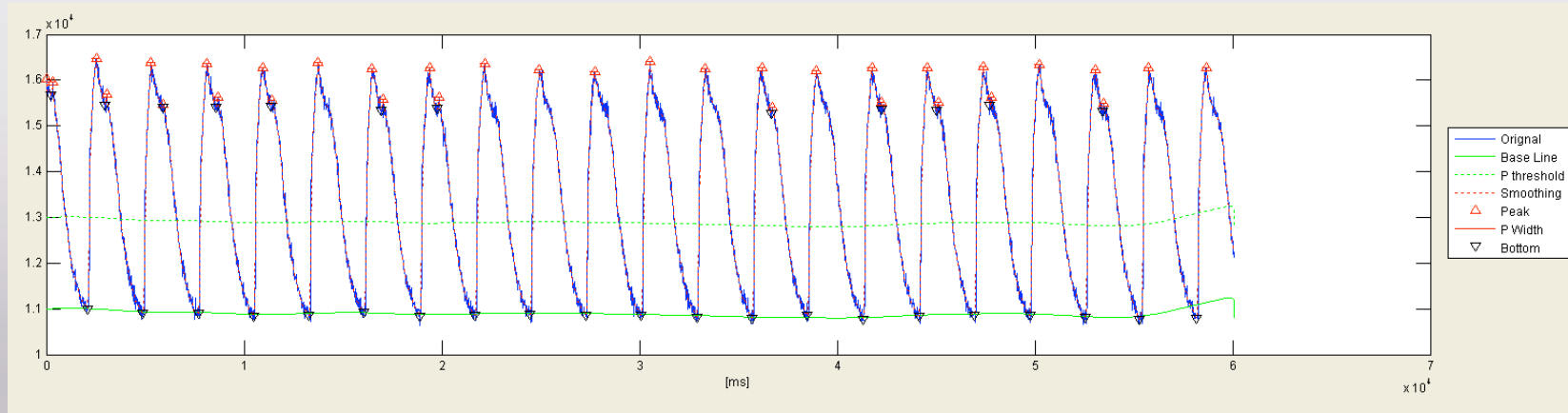


FDSS μ Cell - Astemizole

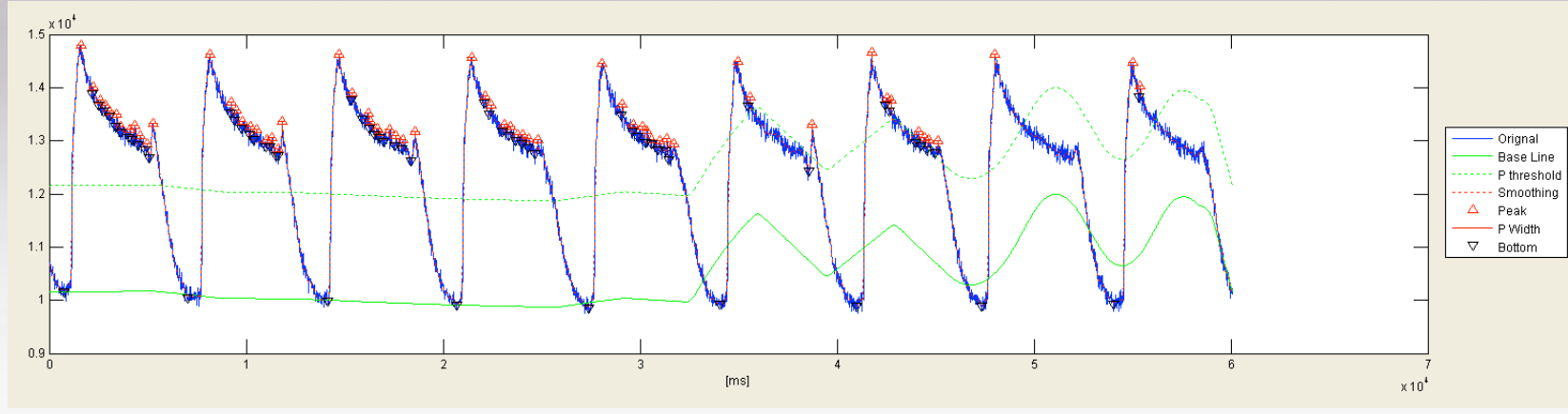
5 min



vehicle control



41 nM

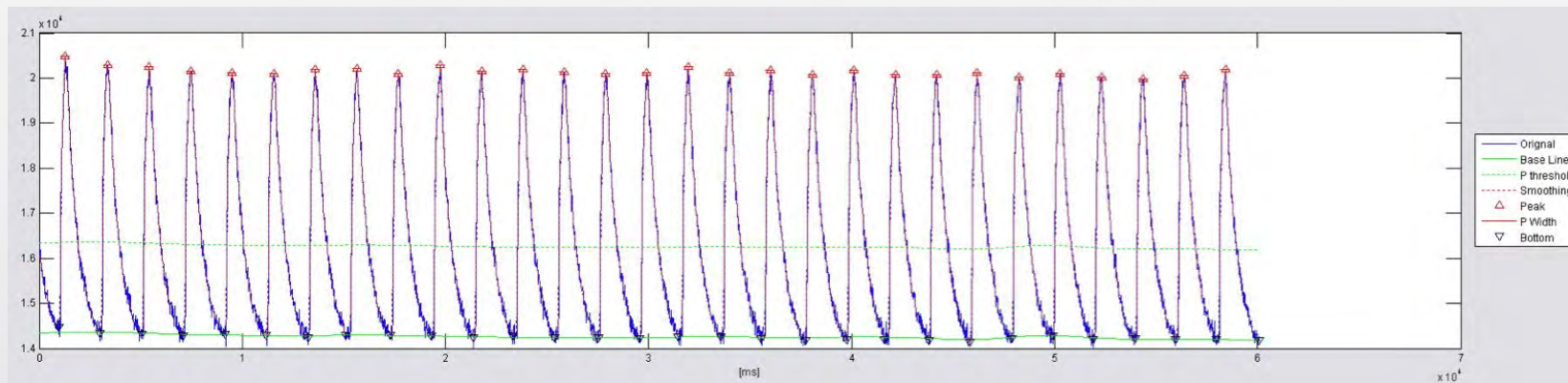


370 nM

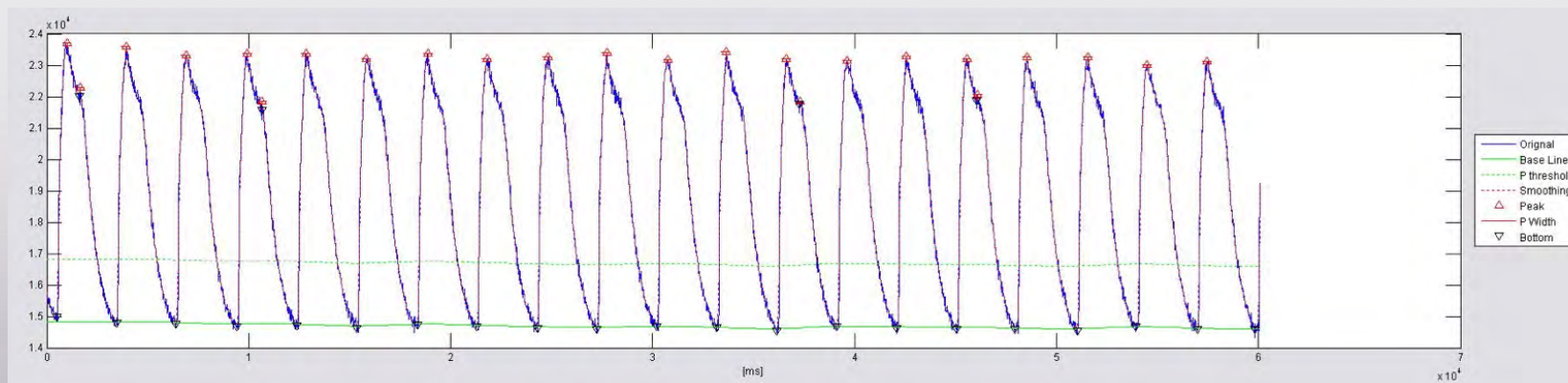
FDSS μ Cell - Astemizole

30 min

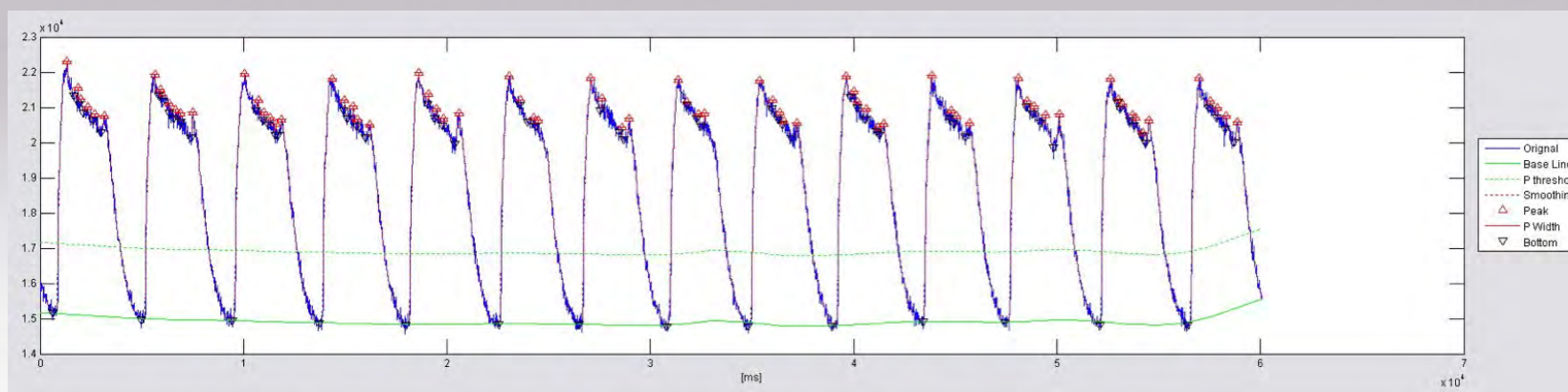
vehicle control



4.57 nM

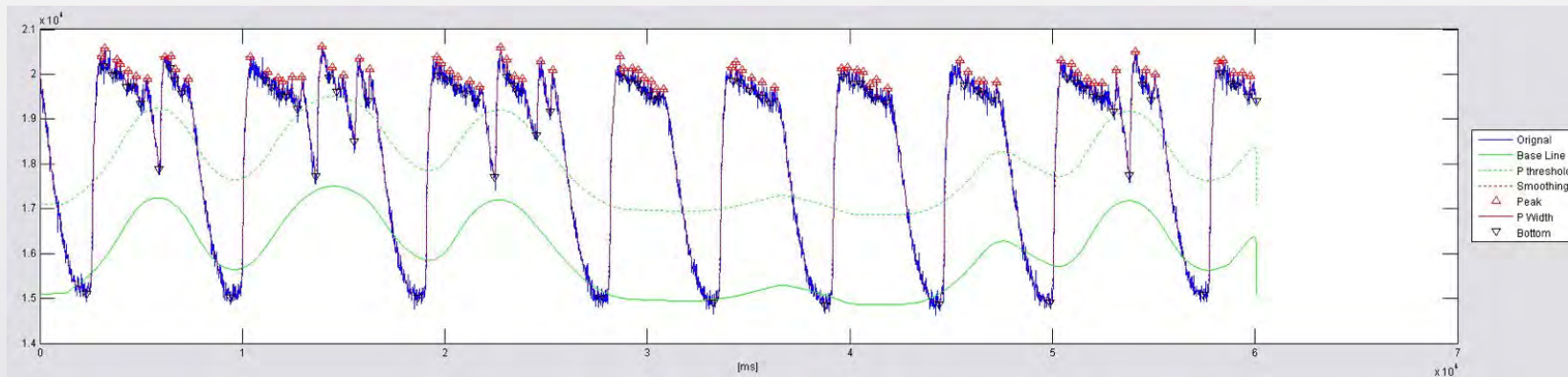


13.7 nM

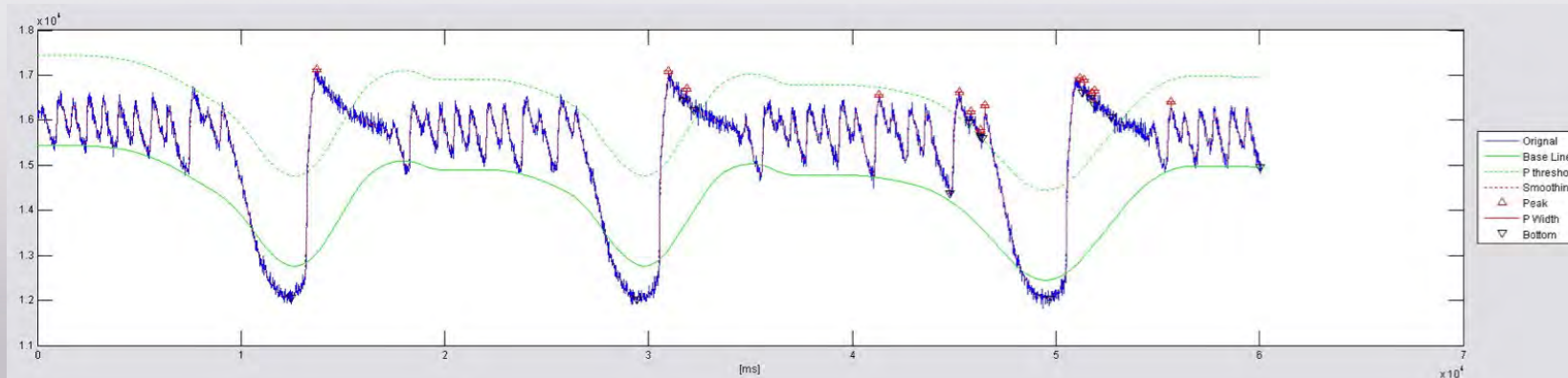


FDSS μ Cell - Astemizole

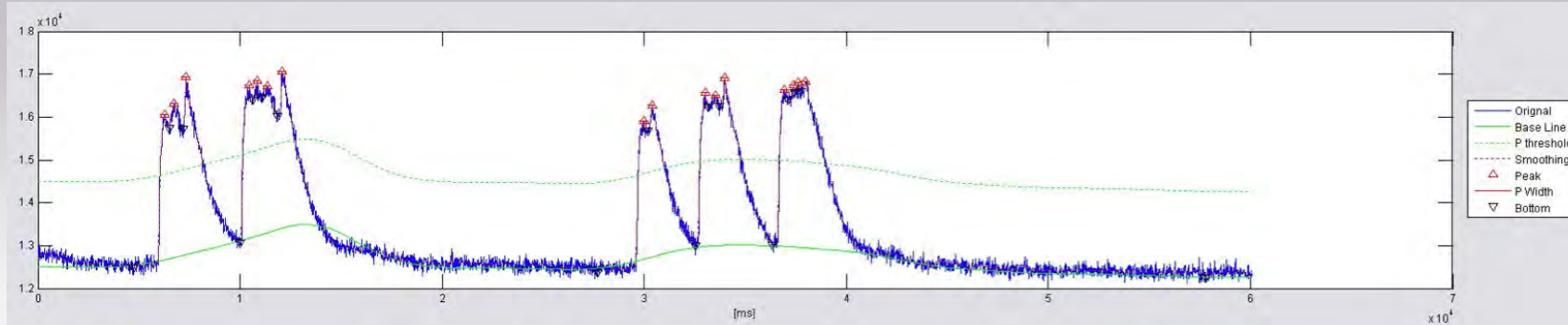
30 min



41 nM



123 nM



370 nM



Data Analysis with the Wave Checker Module

Astemizole



FDSS μ Cell - Astemizole

The Wave Checker Module interface displays a grid of waveforms for 16 wells (A-P) over 24 hours. A zoomed-in view of the waveform for well A3 is shown on the right, with a peak at 29115.16 and a baseline at 4286.61. The interface includes a data table, a data control panel, and a diagram view.

HR	W...	No.1 Integ.Ratio	No.1 Max.Ratio	No.2 Integ.Ratio	No.2 Max.Ratio	No.3 Integ.Ratio	No.3 Max.Ratio
A1	3600.696	1.027	N/A	N/A	N/A	N/A	N/A
A2	3553.879	1.007	N/A	N/A	N/A	N/A	N/A
A3	3519.653	1.139	N/A	N/A	N/A	N/A	N/A
A4	3581.491	1.159	N/A	N/A	N/A	N/A	N/A
A5	3100.615	1.016	N/A	N/A	N/A	N/A	N/A
A6	4066.335	1.372	N/A	N/A	N/A	N/A	N/A
A7	3880.300	1.388	N/A	N/A	N/A	N/A	N/A
A8	3419.916	1.202	N/A	N/A	N/A	N/A	N/A
A9	4080.943	1.460	N/A	N/A	N/A	N/A	N/A
A10	3023.655	1.095	N/A	N/A	N/A	N/A	N/A
A11	3651.290	1.327	N/A	N/A	N/A	N/A	N/A
A12	3239.339	1.120	N/A	N/A	N/A	N/A	N/A
A13	3007.052	1.003	N/A	N/A	N/A	N/A	N/A
A14	3932.280	1.314	N/A	N/A	N/A	N/A	N/A
A15	3481.022	1.115	N/A	N/A	N/A	N/A	N/A

Data Control [axio-cov4U-experiment13093003]

Samp.Line: 00:00.000(m.s.ms)[1/3661]

Select Well: [A1] [A2] [A3] [A4] [A5] [A6] [A7] [A8] [A9] [A10] [A11] [A12] [A13] [A14] [A15]

Select Graph: [Relic] [Ex480 Em540] [Ex480 Em540 1st.9arr] [Integ.Ratio]

Info: [Info] [Text] [Print] [Scale]

Diagram: [SU] [NC] [SB] [PC]

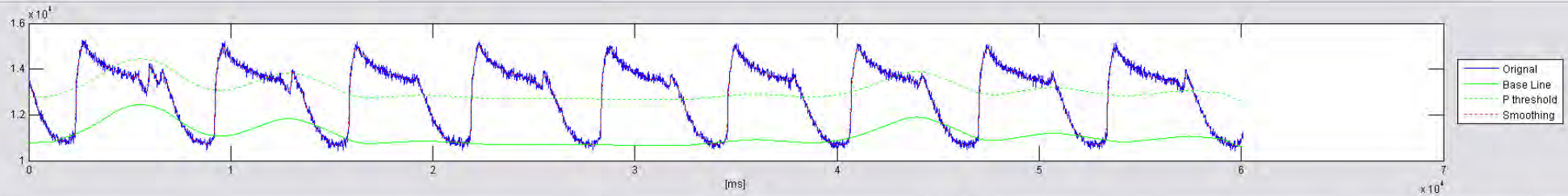
Wave Checker Module





FDSS μ Cell - Astemizole

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
J	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
O	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Result parameter: Table / Graph | Display result parameter: DATA STATUS

Selected well: DATA status: NOT ANALYSIS | Well No.: A 3 | Display

Calculation parameter:

- Input DATA: DATA name: axio-cor4U-experiment13093003 | Loading DATA: 384well DATA
- Interpolation: x 2 | 1 [ms]: 16 | 8 | INTERPOLATE
- Calc parameter: Load | Save
- DATA smoothing: Original | Smoothing | Low

Irregular peak detection level: Reference Ratio: 1.19

Base line: Select Base line: Median | Bottom | Calc range [data number]: 210

Peak parameter: Peak Height threshold: Base line + 2 x10^4 | 3 | Peak Width: Peak \pm 13 data | x1 16 = 208 ms

Analysis parameter (highlighted in red):

- Peak number: 10 %
- P-P time [ms]: 20 %
- Ratio: 30 %
- AMP: 40 %
- RMP: 50 %
- Slope: 10% - 90%
- Integration
- PWD

PWD: 10 % | 20 % | 30 % | 40 % | 50 % | 60 % | 70 % | 80 % | 90 %

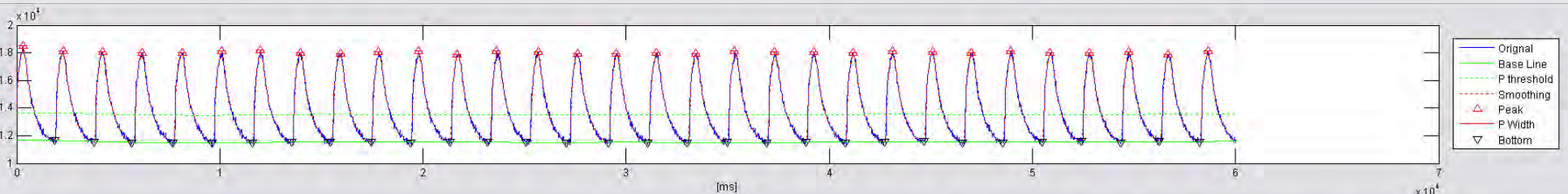
Analysis format: Plate | Selected well | Selected area

Output DATA: C:\FDSS\DATA\TEXT | Output format: Plate | Well | Calculation: TEXT OUT



FDSS μ Cell - Astemizole

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
A	X	X	FAILED-ratio	FAILED-ratio	FAILED-ratio	o	o	o	o	o	o	o	o	o	X	o	o	o	o	o	X	X	X	X
B	X	X	FAILED-ratio	FAILED-ratio	FAILED-ratio	o	o	o	o	o	o	o	FAILED-peak	o	X	o	o	o	X	X	o	X	X	X
C	X	X	FAILED-ratio	FAILED-ratio	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	o	X	X	X	X
D	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	o	X	X	o	X	X	X	X
E	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	X	o	o	o	o	o
F	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	X	X	o
G	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	X	X	X
H	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	X	o	o	o	o	o
I	o	o	o	o	o	o	o	o	o	o	o	o	o	o	FAILED-peak	o	o	o	o	o	o	X	X	o
J	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	o
K	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	o	o	FAILED-ratio
L	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	X
M	X	o	o	o	o	o	o	o	o	o	o	o	FAILED-peak	o	o	o	o	o	o	o	X	o	X	X
N	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	o	X	o	o	o	X	X
O	o	o	o	o	o	o	X	o	o	X	o	o	o	o	o	o	X	o	o	X	o	X	X	X
P	X	o	FAILED-ratio	FAILED-ratio	o	o	o	o	o	o	o	o	X	X	o	X	X	X	o	X	o	X	X	X



Result parameter: Table / Graph | Display result parameter: DATA STATUS

Selected well: DATA status: ANALYZED | Well No.: A 11 | Display

Calculation parameter:

- Input DATA: DATA name: axio-cor4U-experiment13093003 | Loading DATA: 384well DATA
- Interpolation: x 2 | t [ms]: 16 -> 8 | INTERPOLATE
- Calc parameter: Load | Save
- DATA smoothing: Original | Smoothing | Low

Irregular peak detection level: Reference Ratio: 1.19

Base line: Select Base line: Median | Bottom | Calc range [data number]: -210

Peak parameter: Peak Height threshold: Base line + 2 x 10^4 | 3 x 10^4 | Peak Width: Peak #: 13 | data | x t: 16 | = | 208 | ms

Analysis parameter: Peak number, P-P time [ms], Ratio, AMP, RMP, Slope: 10% - 90%, Integration, PWD

PWD: 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%

Analysis format: Plate, Selected well, Selected area

Output DATA: C:\FDSS\DATA\TEXT\ | Output format: Plate, Well, Calculation path

START <PLATE> | RESET <PLATE> | TEXT OUT

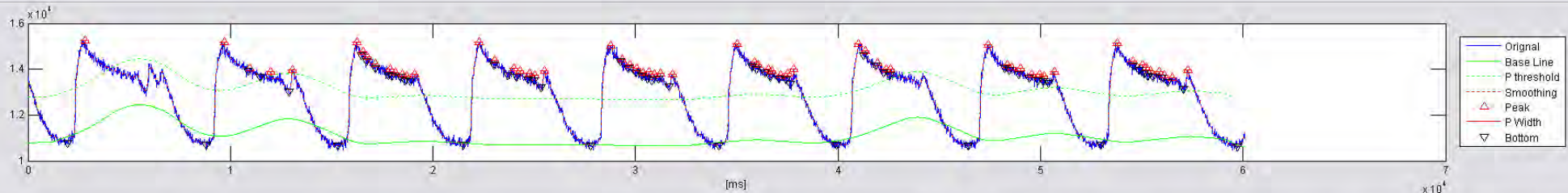
export of text file format





FDSS μ Cell - Astemizole

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
A	X	X	FAILED-ratio	FAILED-ratio	FAILED-ratio	o	o	o	o	o	o	o	o	o	X	o	o	o	o	o	X	X	X	X
B	X	X	FAILED-ratio	FAILED-ratio	FAILED-ratio	o	o	o	o	o	o	o	o	o	X	o	o	o	o	o	X	X	X	X
C	X	X	FAILED-ratio	FAILED-ratio	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	X	X	X	X
D	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	o	o	o	X	X	X	X	X
E	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	X	o	o	o	o
F	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
G	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	X	X
H	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
I	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
J	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
K	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	X	X
L	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	X
M	X	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	X
N	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	o	X	o	o	o	X	X
O	o	o	o	o	o	o	X	o	X	o	o	o	X	o	X	o	X	o	o	X	X	X	X	X
P	X	o	FAILED-ratio	FAILED-ratio	o	o	o	o	o	o	o	o	X	X	o	X	X	X	o	X	o	X	X	X



Result parameter: Table / Graph, Display result parameter: DATA STATUS, Selected well: DATA status: FAILED-ratio, Well No.: A 3

Calculation parameter:

Input DATA: DATA name: axio-cor4U-experiment1 3093003, Loading DATA: 384well DATA

Interpolation: x2, t [ms]: 16 -> 8, INTERPOLATE

Calc parameter: Load, Save

DATA smoothing: Original, Smoothing, Low

Irregular peak detection level: Reference Ratio: 1.19

Base line: Select Base line: Median, Bottom, Calc range [data number]: 210

Peak parameter: Peak Height threshold: Base line + 2 x 10^4, 3 x 10^4, Peak Width: Peak \geq 13 data, x t 16 = 208 ms

Analysis parameter: Peak number, P-P time [ms], Ratio, AMP, RMP, Slope: 10% - 90%, Integration, PWD

PWD: 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%

Analysis format: Plate, Selected well, Selected area

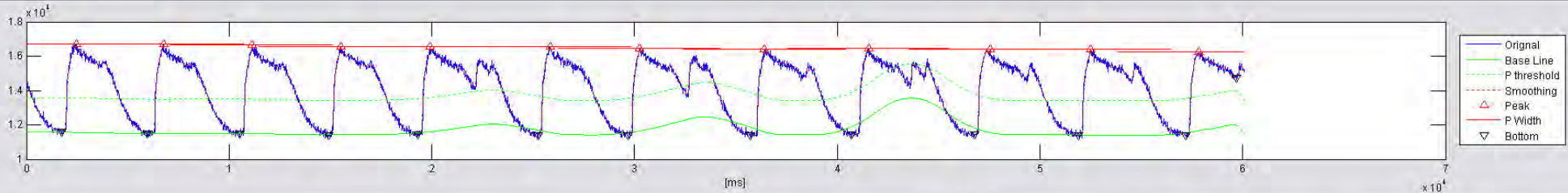
Output DATA: C:\FDSS\DATA\TEKT, Output format: Plate, Well

Buttons: Display, START <PLATE>, RESET <PLATE>, TEXT OUT



FDSS μ Cell - Astemizole

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
A	X	X	O	O	O	O	O	O	O	O	O	O	O	O	X	O	O	O	O	O	X	X	X	X
B	X	X	O	O	O	O	O	O	O	O	O	O	O	O	X	O	O	O	O	O	X	X	X	X
C	X	X	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	X	O	X	X	X	X
D	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	X	O	X	X	X	X	X	X	X
E	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	X	X	X	X	X
F	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	X	X	X
G	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	X	X	X
H	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	X	X	O	O	O	X	X	X
I	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	X	X	FAILED-peak
J	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	X	O
K	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	X	O	X	O
L	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	X	O
M	X	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	X	O	X	X
N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	X	O	X	O	O	X	X	X
O	O	O	O	O	O	O	X	O	X	O	O	O	X	O	X	X	X	O	O	X	X	X	X	X
P	X	O	O	O	O	O	O	O	O	O	O	O	X	X	O	X	X	X	O	X	O	X	X	X



Result parameter: Table / Graph, Display result parameter: DATA STATUS

Selected well: DATA status: ANALYZED, Well No.: A 4, Display

Calculation parameter:

Input DATA: DATA name: axio-cor4U-experiment1 3093003, Loading DATA: 384well DATA

Interpolation: x2, 1 [ms]: 16, 8, INTERPOLATE

Calc parameter: Load, Save

DATA smoothing: Original, Smoothing, Low

Irregular peak detection level: Reference Ratio: 1.19

Base line: Select Base line: Median, Bottom, Calc range [data number]: 210

Peak parameter: Peak Height threshold: Base line + 2 x 10^4, 3, Peak Width: Peak \pm 244 x t 16 = 3904 ms

Analysis parameter: Peak number, P-P time [ms], Ratio, AMP, RMP, Slope: 10% - 90%, Integration, PWD

PWD: 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%

Analysis format: Plate, Selected well, Selected area

Output DATA: C:\FDSSDATA\TEXT1, Output format: Plate, Well, CALCULATED PWD

START <PLATE>, RESET <PLATE>, TEXT OUT

FDSS7000EX\UCCELL <Offline [96,384or1536wells] > - [D:\FDSSDATA\DATA]axio-cor4U-



FDSS μ Cell - Astemizole

HAMAMATSU_WAVE_CHECKER_beta_2_0

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
A	X	X	o	o	o	o	o	o	o	o	o	o	o	o	X	o	o	o	o	o	X	X	X	X
B	X	X	o	o	o	o	o	o	o	o	o	o	o	o	X	o	o	o	X	X	o	X	X	X
C	X	X	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	X	o	X	X	X
D	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	o	o	X	X	o	X	X	X
E	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	X	o	o	X	X
F	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	X	o
G	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	X	X
H	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	X	o	o	o	X	o
I	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	X	o
J	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	o
K	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	o	X	o
L	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	X
M	X	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	o	X	X
N	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	X	o	o	o	o	X	X	X
O	o	o	o	o	o	o	o	o	o	o	o	o	X	o	o	o	X	o	o	o	X	X	X	X
P	X	o	o	o	o	o	o	o	o	o	o	o	X	X	o	X	X	X	o	X	o	X	X	X

Result parameter: Table / Graph | Display result parameter: DATA STATUS

Selected well: DATA status: ANALYZED | Well No.: A 11 | Display

Calculation parameter:

Input DATA: DATA name: axio-cdr4U-experiment13093003 | Loading DATA: 384well DATA

Interpolation: x 2 | 1 [ms]: 16 -> 8 | INTERPOLATE

Calc parameter: Load | Save

DATA smoothing: Original | Smoothing | Low

Irregular peak detection level: Reference Ratio: 1.19

Base line: Select Base line: Median | Bottom | Calc range [data number]: 210

Peak parameter: Peak Height threshold: Base line + 2 x 10^4 3 | Peak Width: Peak \pm 244 x 1 16 = 3904 ms

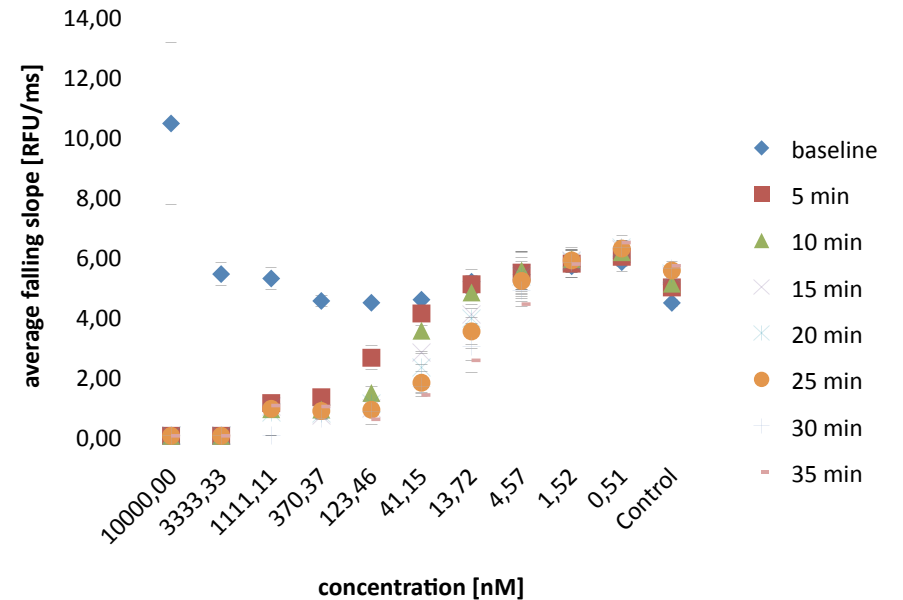
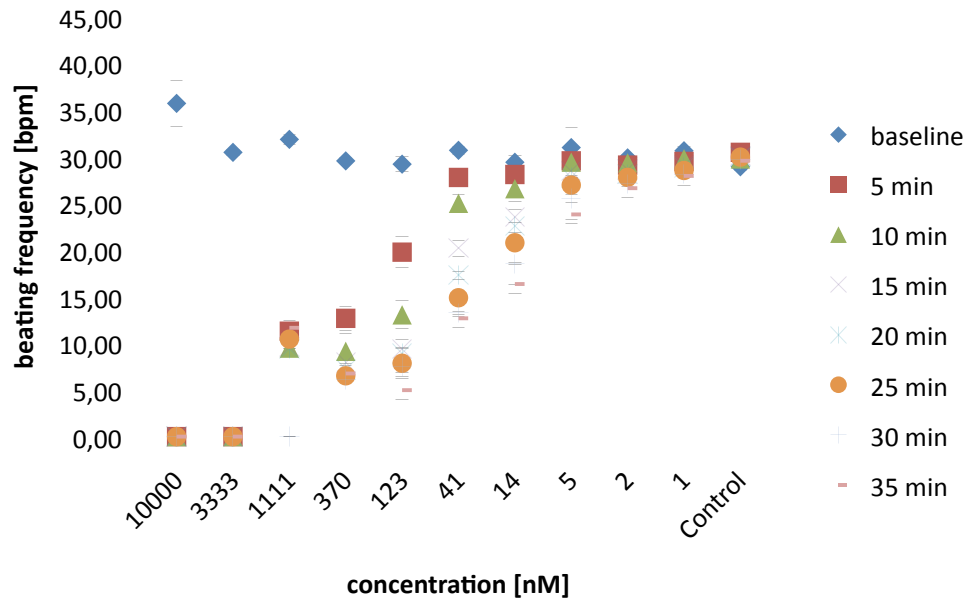
Analysis parameter: Peak number | P-P time [ms] | Ratio | AMP | RMP | Slope: 10% - 90% | Integration | PWD: 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | Analysis format: Plate | Selected well | Selected area

Output DATA: C:\FDSS\DATA\TEXT | Output format: Plate | Well: Calculated well

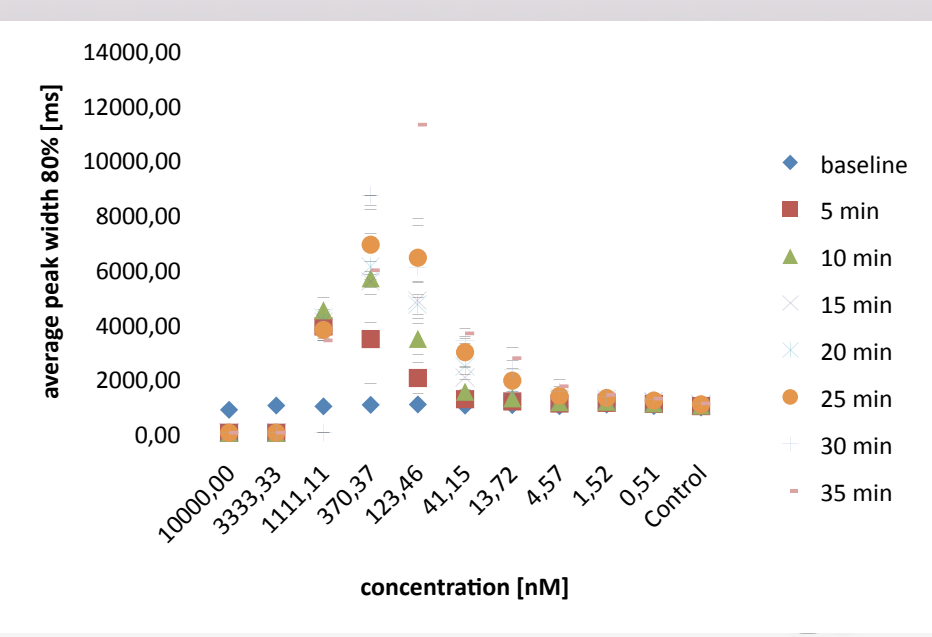
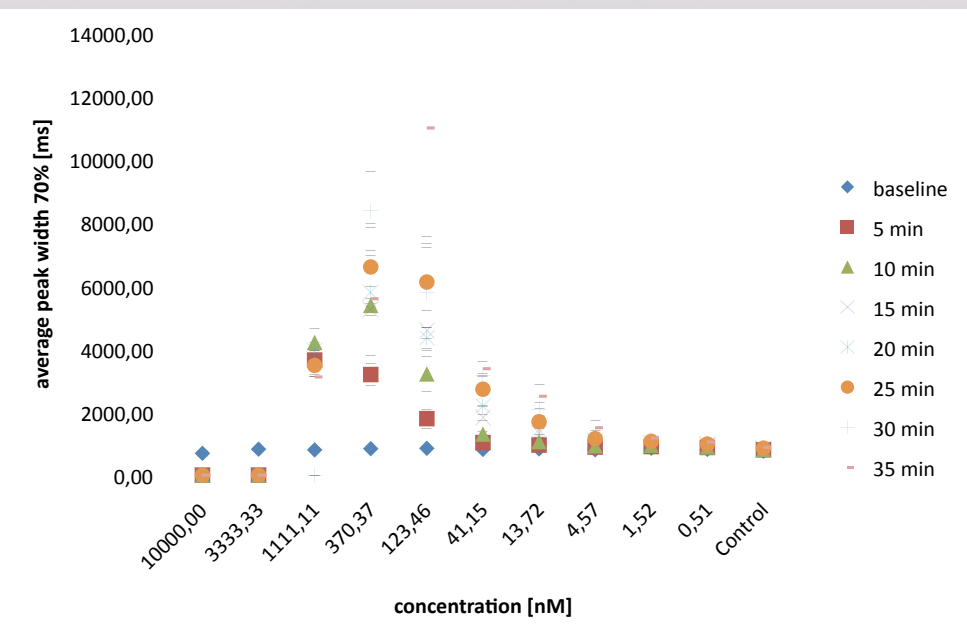
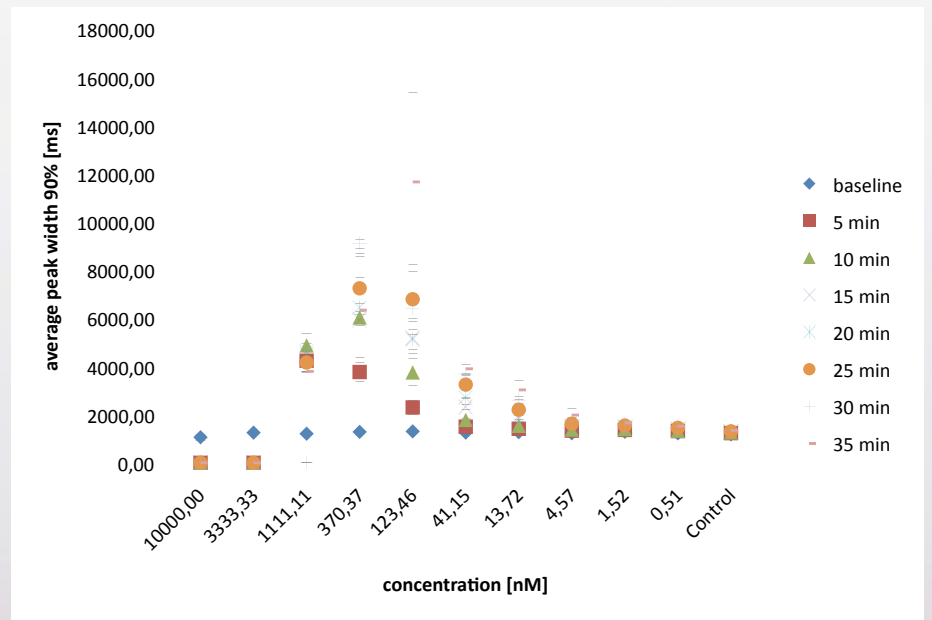
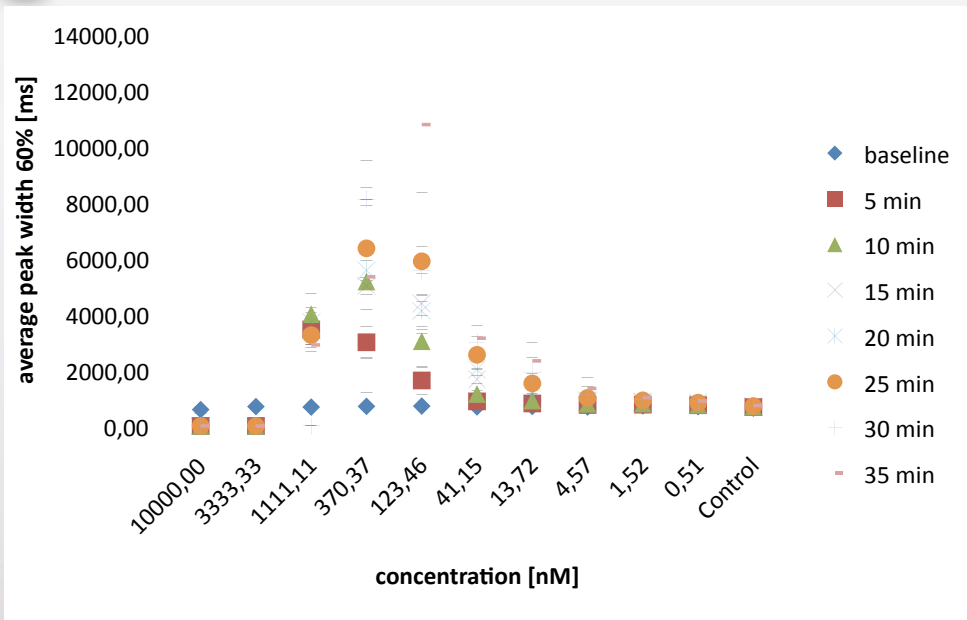
START <PLATE> | RESET <PLATE> | TEXT OUT



FDSS μ Cell - Astemizole



FDSS μ Cell - Astemizole



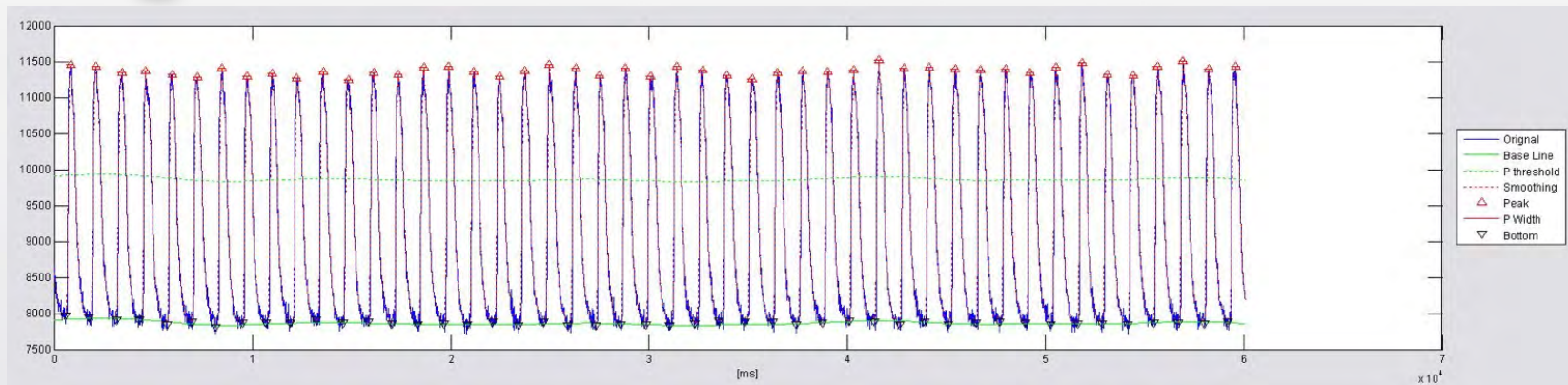


Dofetilide
hERG Blocker

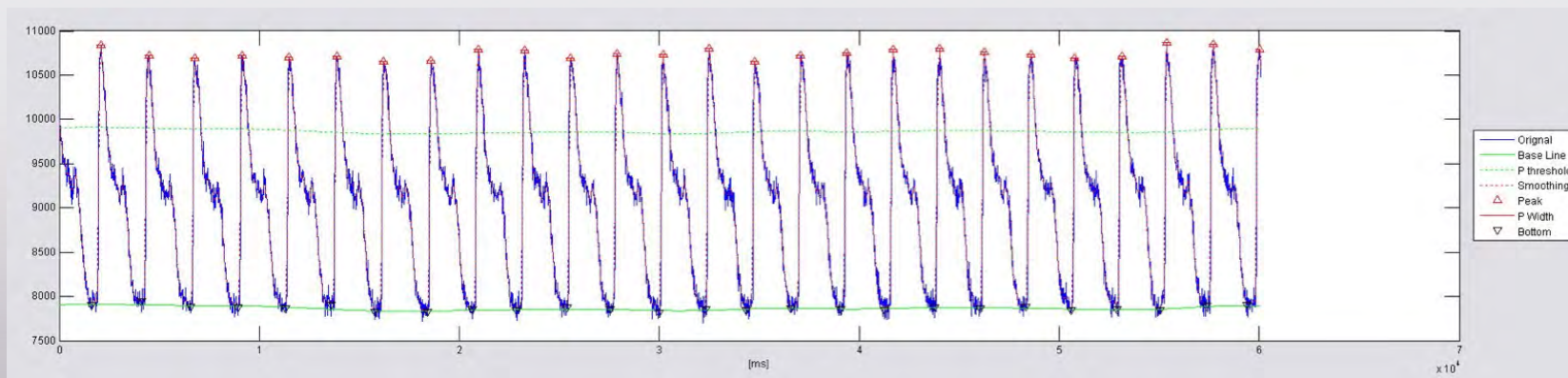


FDSS μ Cell - Dofetilide

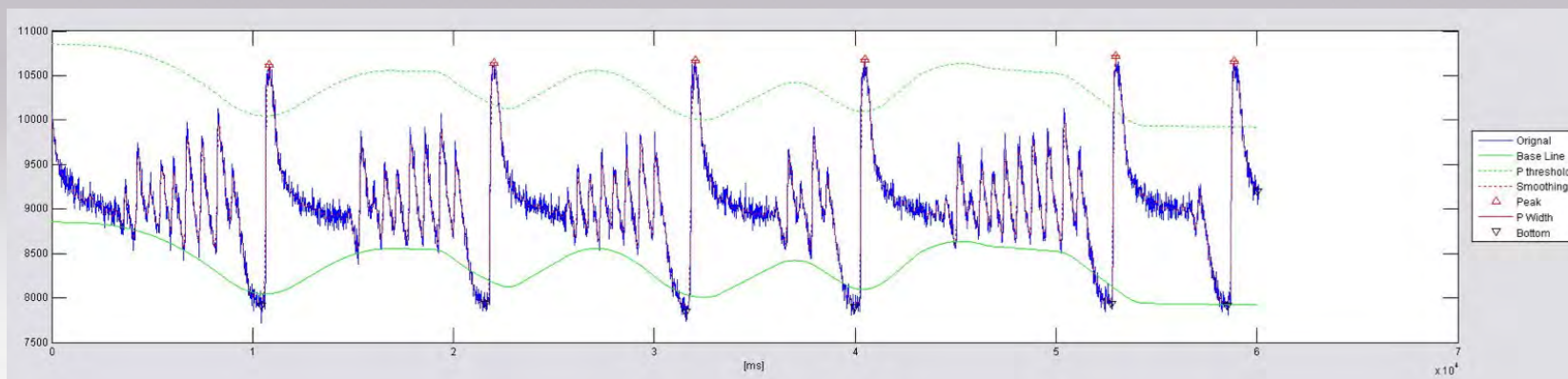
5 min



vehicle
control



24.7 nM

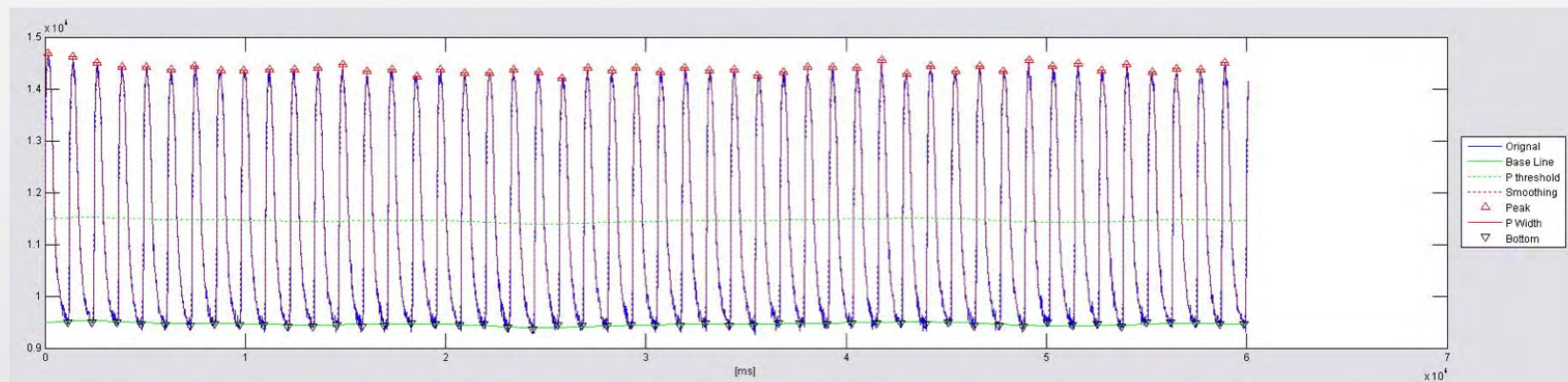


222 nM

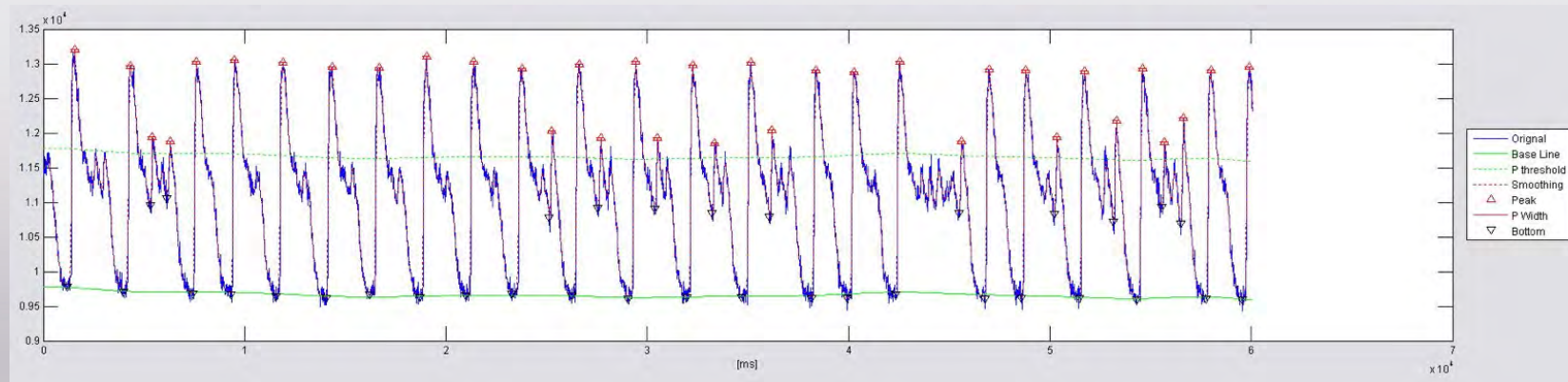


FDSS μ Cell - Dofetilide

30 min



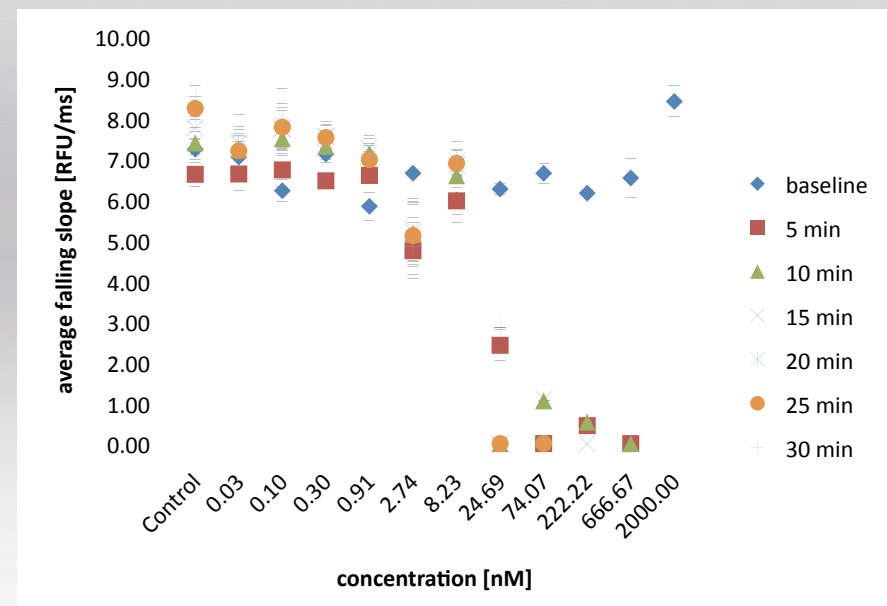
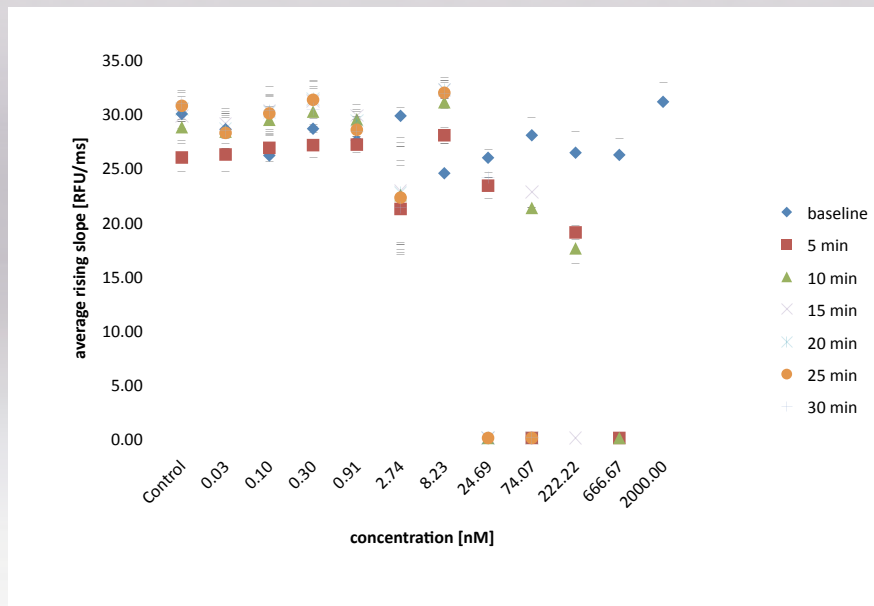
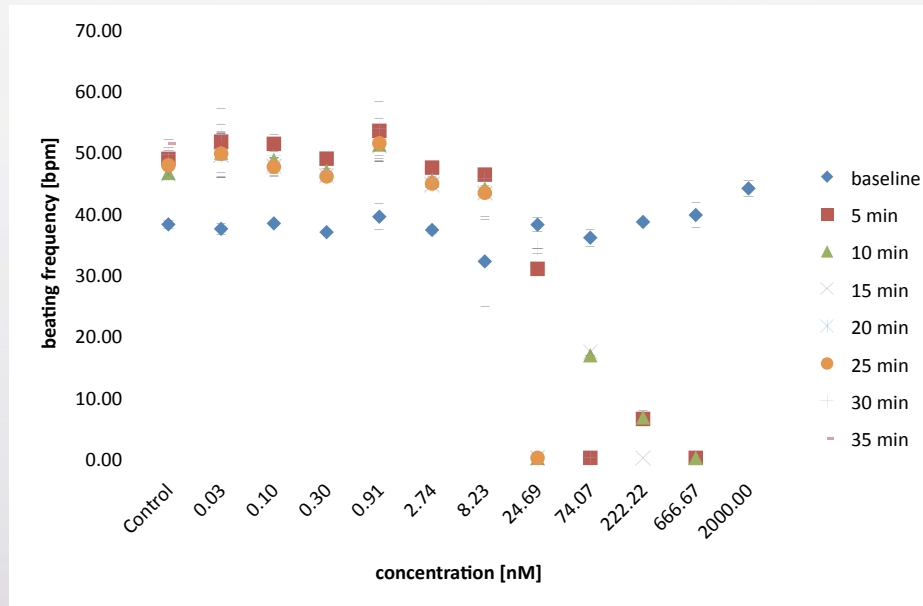
vehicle
control



24.7 nM

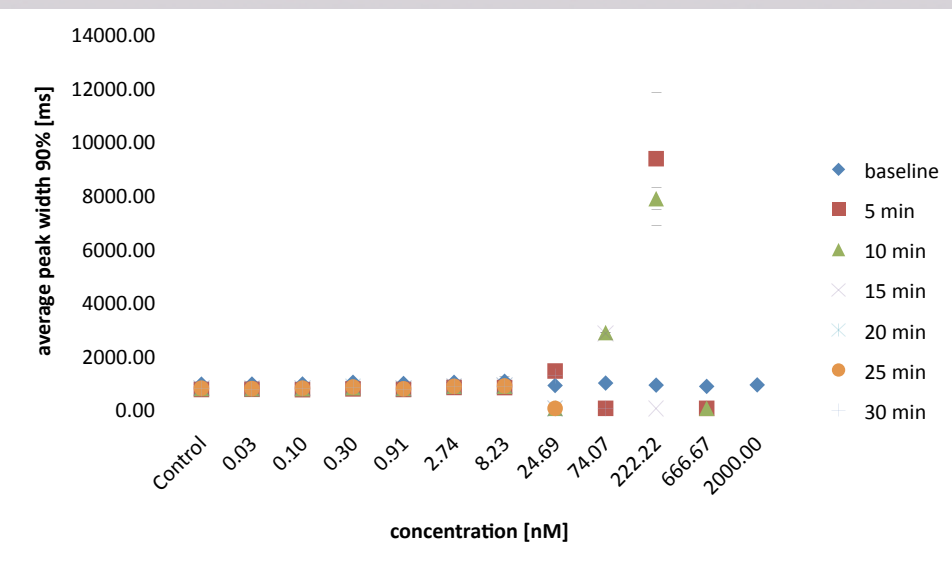
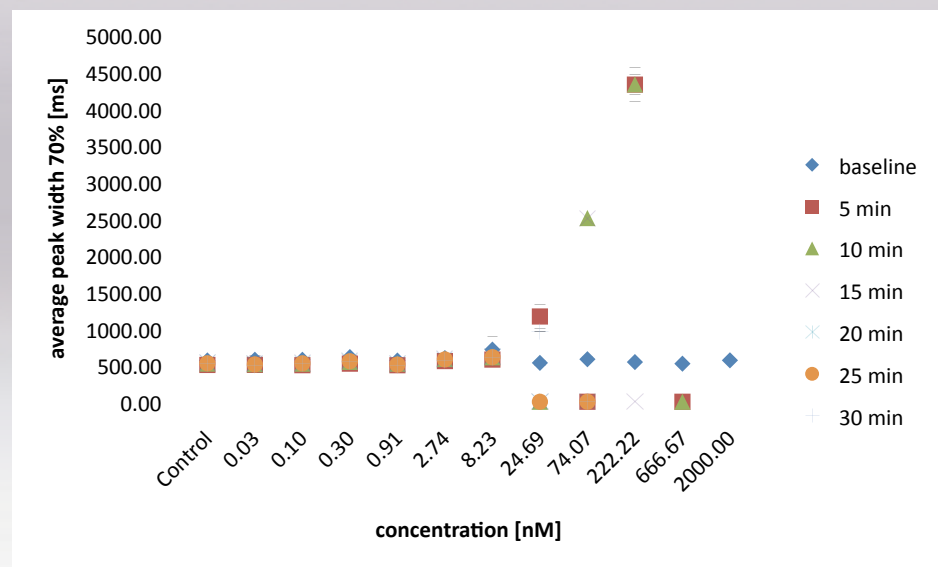
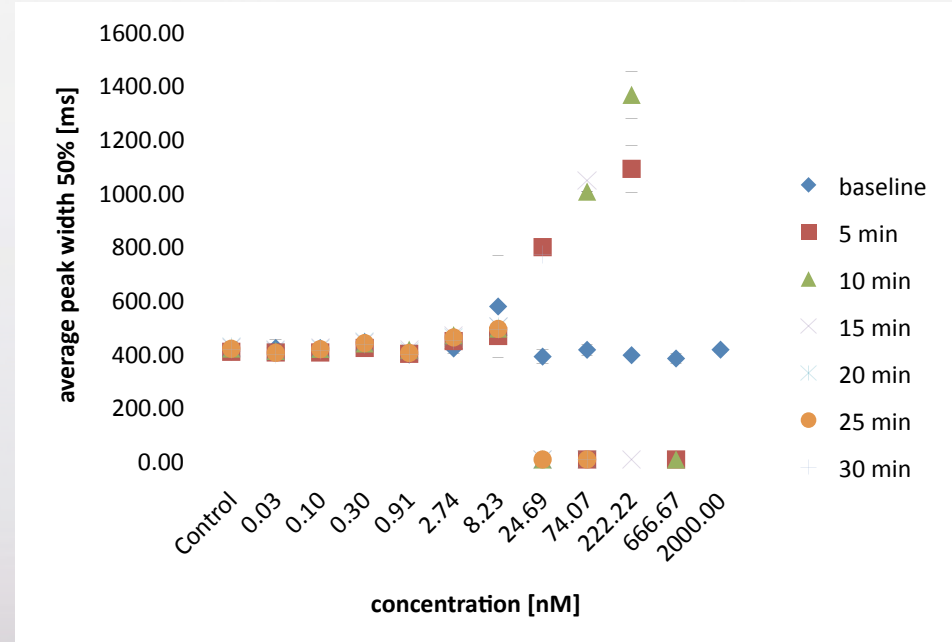
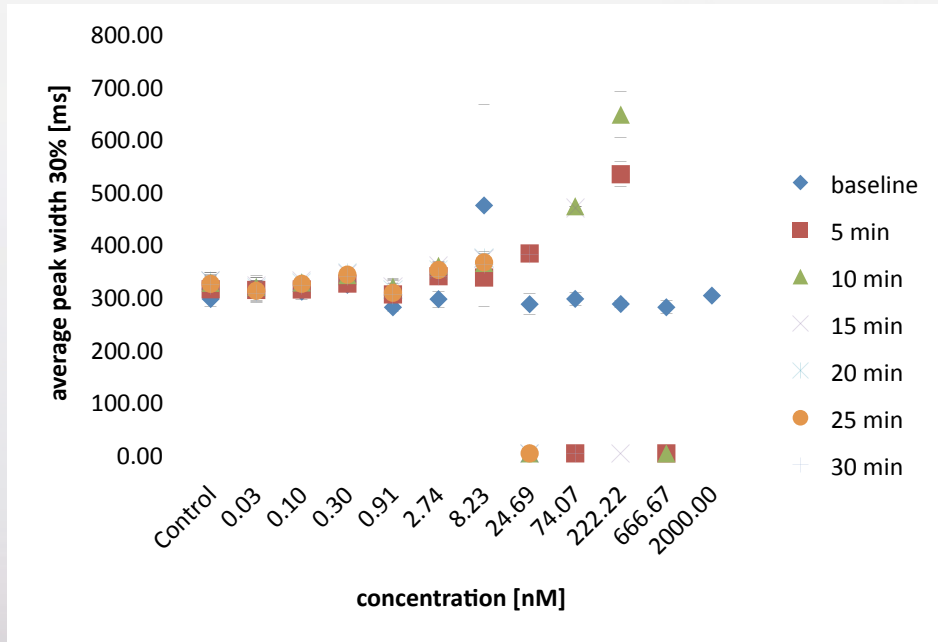


FDSS μ Cell - Dofetilide





FDSS μ Cell - Dofetilide



FDSS μ Cell - Clustering of Compounds





Outlook

Outlook - Hamamatsu FDSS 7000EX



Camera for fast recording of fluorescence and luminescence.



Outlook

- Evaluation of different kinds of fluorescent calcium and membrane potential dyes for the Cor.4U Cardiomyocytes
- Establishment of cardiac cytotoxicity/viability assay
 - Combination of different luminescence assays
 - viability
 - cell death detection
 - apoptosis

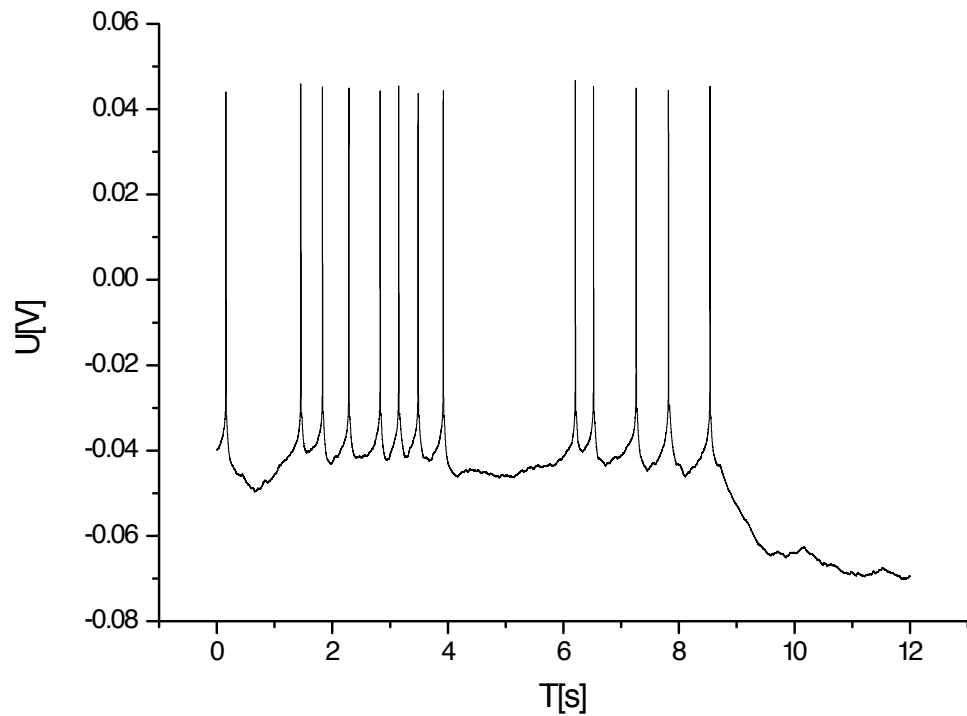


Dopaminergic and Sensory Neurons

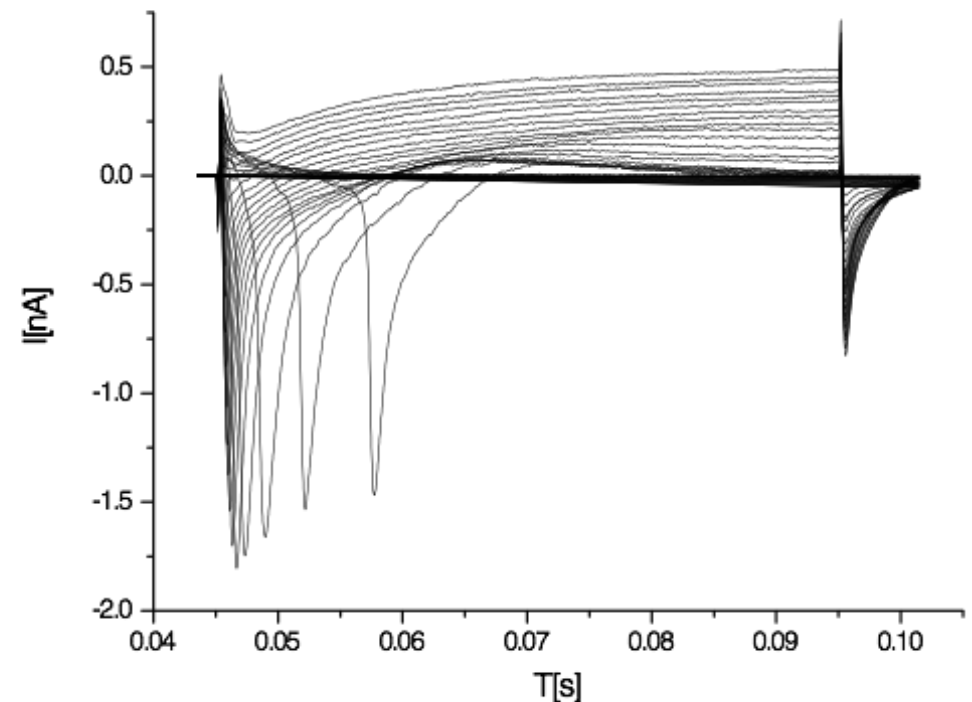


Patch Clamp of hiPS-derived Dopaminergic Neurons

Manual current clamp recording of spontaneous action potentials



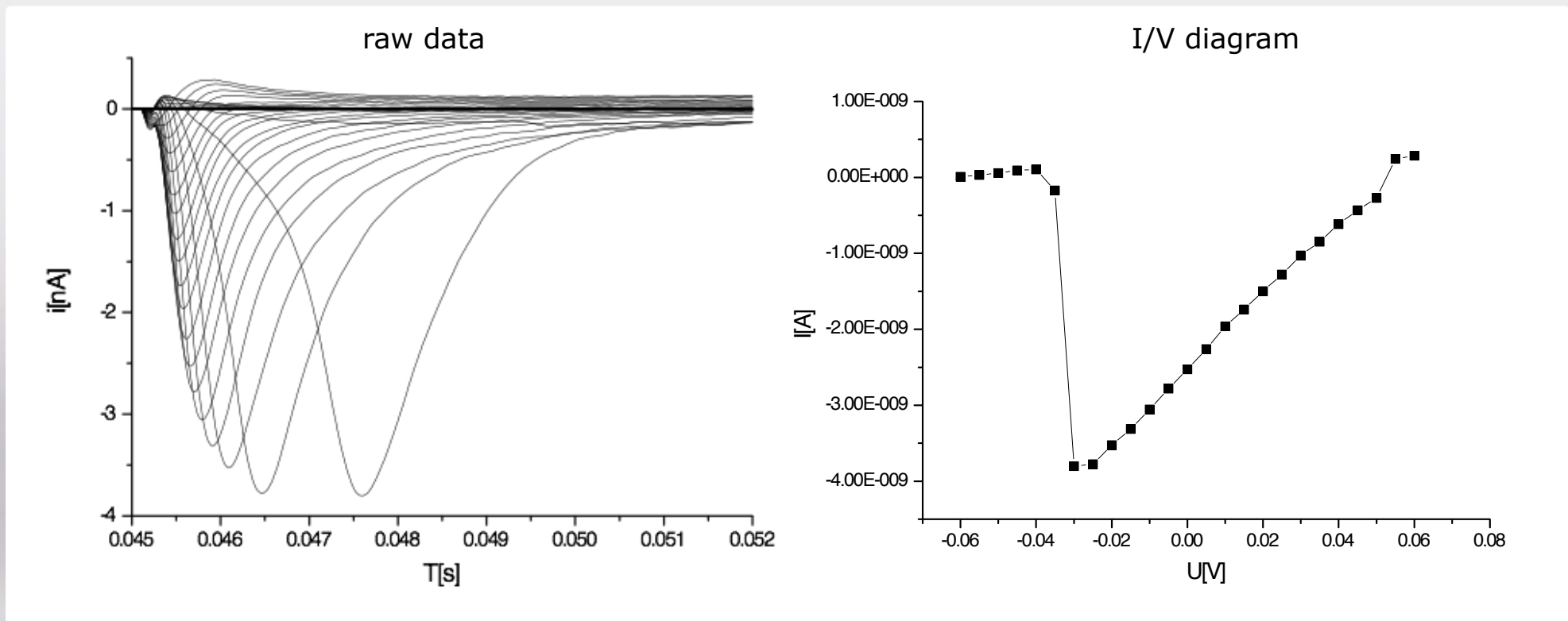
Manual voltage clamp recording of sodium currents



Data was kindly provided by PoreGenic GmbH, Rostock, Germany

Patch Clamp of hiPS-derived Peripheral Neurons

Manual voltage clamp recording
of sodium currents



Data was kindly provided by PoreGenic GmbH, Rostock, Germany



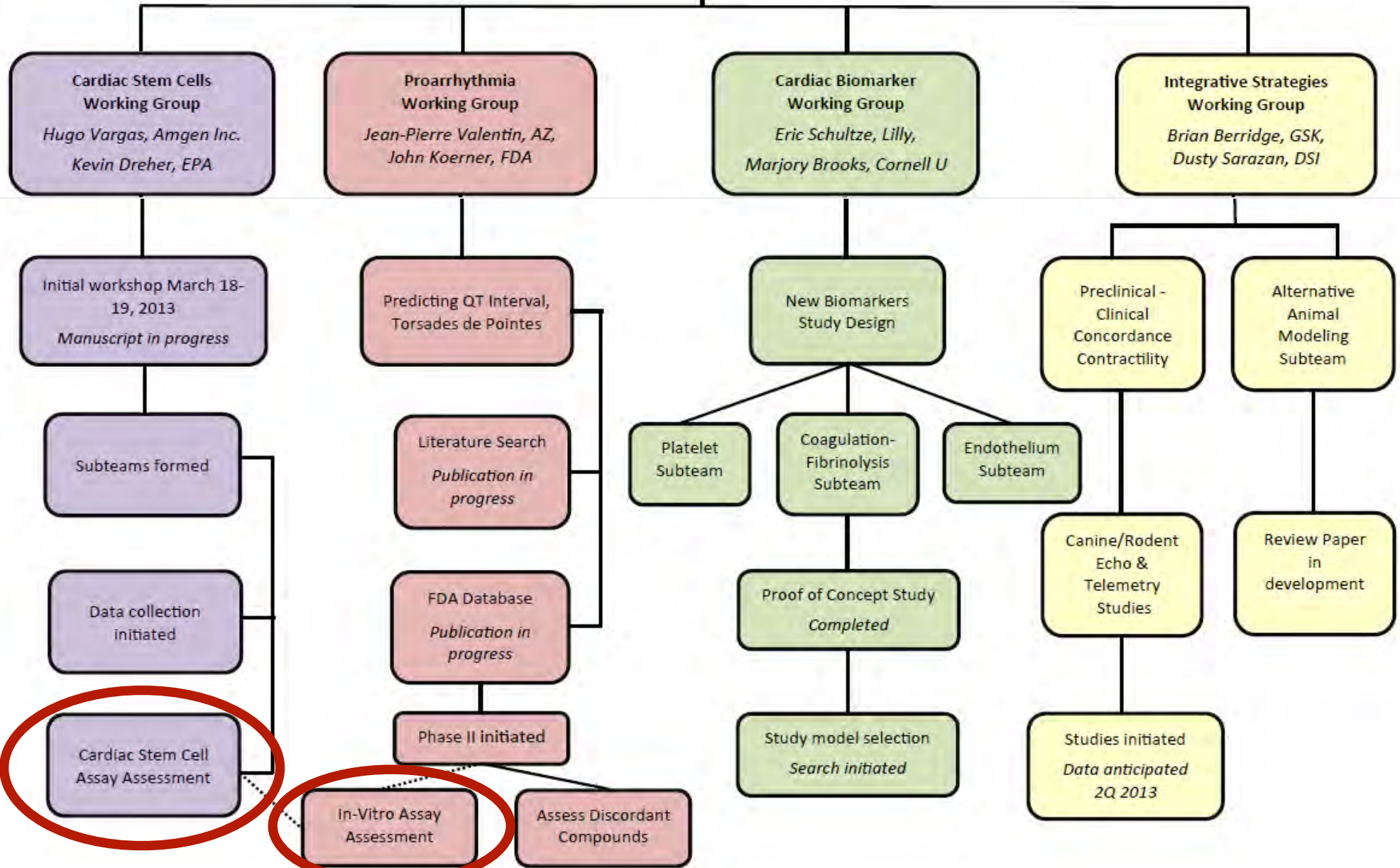
Health and Environmental Science Institute (HESI) Initiative

CiPA Initiative

(Comprehensive in vitro Pro-Arrhythmia Assay)



Cardiac Safety Committee Working Groups: 2013

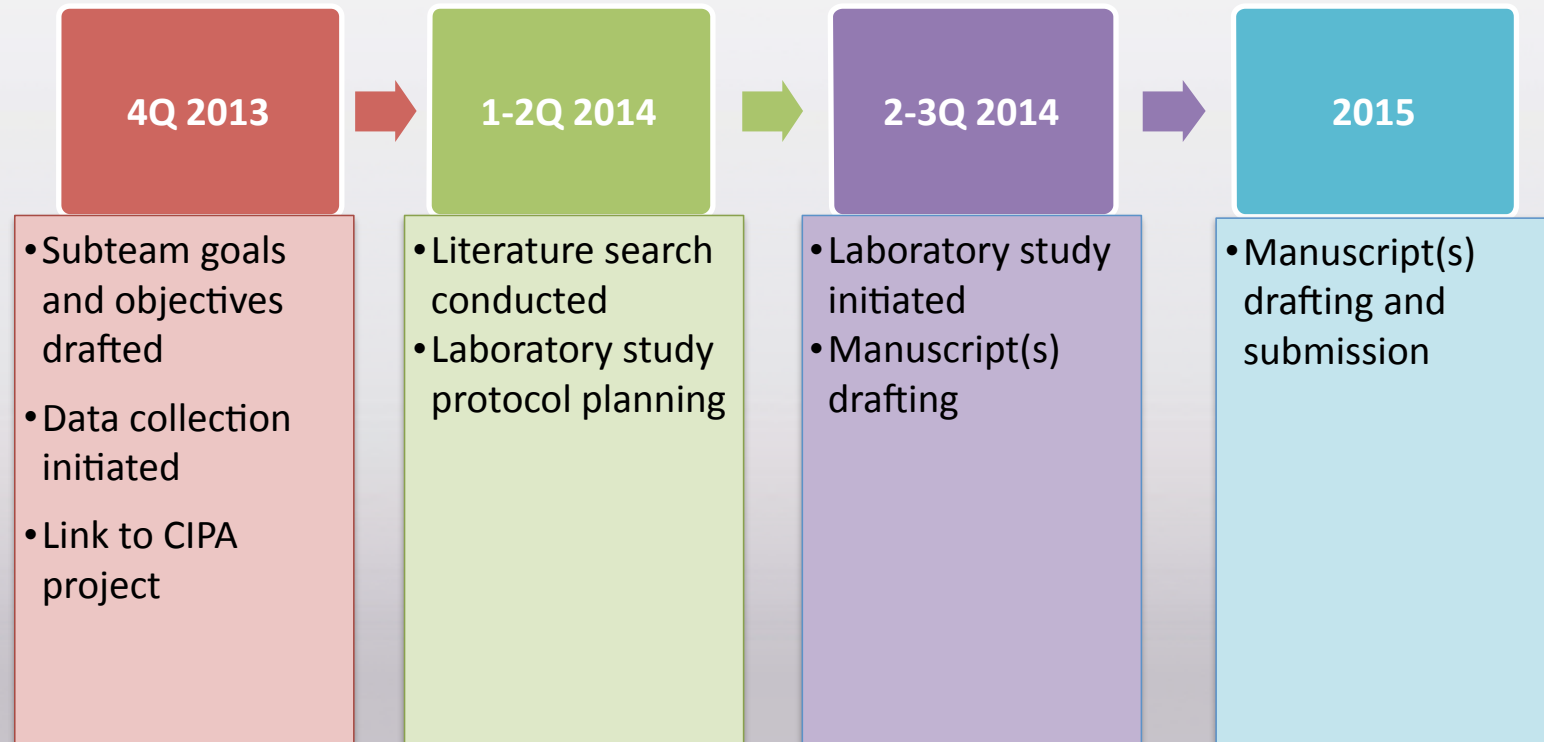




HESI - Initiative

- Stem Cell Working Groups - Newly Initiated
 - Following the workshop, the Cardiac Stem Cell Working Group formed and three subteams were created:
 - Cytotoxicity
 - Contractility,
 - Electrophysiology
- to explore issues of sensitivity, reproducibility, and predictivity for safety endpoints.

Cardiac Stem Cell Working Group: Timeline





Thanks to:

- **Axiogenesis AG**

Anika Duenbostell

- **Hamamatsu**

Jean Marc D'Angelo

Thomas Niedereichholz

Cyril Guerinot

Thibault Poissinger

Hirofumi Horai

- **Sanofi, Frankfurt**

Dr. Thomas Licher