

## **MetaXpress® 6 Software Guide**

Viewing Analysis Measurements in Review Plate Data

UNLEASH YOUR BRILLIANCE

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#### **Chapter Purpose**

The purpose of this chapter is to guide the user through viewing analysis measurements, displaying results in a heat map, and logging data directly to Excel or a Text file from the **Review Plate Data** dialog.

Refer to corresponding chapters for application chapters, Custom Module Editor, running analyses.





- 1. Open Review Plata Data
  - In the main toolbar click on



- Under the Screening menu, select Review Plate Data
- 2. Click on the Select Plate button
- 3. Browse through the folders to open the plate of interest

vaveleriguis.	Data vi	ew:	N	/ell a	ma	nge	mer	nt			•										F	nint	Tal	ble	
DAPI		01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
FITC	A									-															
	В																								
	С			•																					
	D			•																					
	E			•																					
	F			•																					
	G											1													
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	L			•																					
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Displayed well	N			•																					
Part of montage	0																_								
Selected wells	Р		1			1		· · ·		-															

Select Plate for Review				
			<b>I</b>	1
Plates     System Administrator [Creator Name -         Ot/20/15 [Date Created - Plate Info]         O5/21/15 [Date Created - Plate Info]         O6/04/15 [Date Created - Plate Info]	Plate Info]			
Name [Plate Info]	Acquisiti	Barcode	Creator	Date\Ti
Name [Plate Info] EX1NuclearFoci_AMSNVL-C0H8KV1_1	Acquisiti EX1Nucl	Barcode <null></null>	Creator System	Date\Ti 04/20/15
Name [Plate Info] EX1NuclearFoci_AMSNVL-C0H8KV1_1 EX2TransfluorVesicles_AMSNVL-C0H8KV1_2	Acquisiti EX1Nucl EX2Tran	Barcode <null> <null></null></null>	Creator System System	Date\Ti 04/20/15 04/20/15
Name [Plate Info] EX1NuclearFoci_AMSNVL-C0H8KV1_1 EX2TransfluorVesicles_AMSNVL-C0H8KV1_2 EX3ThreeCHCellScoring_AMSNVL-C0H8KV1_3	Acquisiti EX1Nucl EX2Tran EX3Thre	Barcode <null> <null> <null></null></null></null>	Creator System System	Date\Ti 04/20/15 04/20/15 04/20/15



- 4. Select the Measurement tab
- 5. Select the analysis to be viewed in the **Analysis** drop-down menu
- 6. Select a measurement of interest from the **Measurement** drop-down menu
  - Measurements preceded by "**Cell:**" are cell-by cell data. Values shown in the plate grid are the average of all cells found in the well. To view cell-by cell data for the selected site/well, click on the **Cellular Results...**button
- 7. Values in the plate view will automatically update with the selected measurement

If after running an analysis only dash marks appear in the plate grid, select the **Display** tab and enable **Show values** 

Display Run Analysis M
Show Values
Intensity Profile
Color Composite







- 8. By default, data is displayed in **Well Arrangement** (plate format)
- 9. To change the view, change **Data View** to
  - **Time point vs Well**: matrix view of select measurements across all time points; columns are time points and rows are well ID.
  - **Z Step vs Well**: matrix view of select measurements across all Z steps; columns are Z steps and rows are well ID.
  - **Measurement vs Well**: matrix view of all measurements for a single plane; columns are measurements and rows are well ID.

Data v	view: W	ell arrang	gement			•	]					
	01	02	03	04	05	06	07	08	09	10	11	12
Α												
В												
С												
D												
E												
F	439.0	419.0	442.0									
G	379.0	336.0	307.0									
Н	308.0	287.0	358.0									

Data v	Data view: Measurement vs Well 🔻											
	Total Nuclei (CountNuclei)	Total Area (CountNuclei)	Mean Area (CountNuclei)	Integrated Intensity (CountNuclei)								
B12												
C01												
C02												
C03												
C04	17.0	241211.6	14188.9	17239339008.0								
C05	18.0	241349.8	13408.3	17227675648.0								
000												

Data v	•						
	01	02	03	04	05	06	
B12							
C01							
C02							
C03							
C04	17.0	17.0	17.0	17.0	17.0	17.0	
C05	18.0	18.0	18.0	18.0	18.0	18.0	
COC							





- 10. To view data in plates that containing multiple sites:
  - **Single site**: uncheck **All Sites** and select the site of interest by left-clicking in the **Sites** section; selected site will be highlighted in gray.
  - All sites: Enable the box next to All Sites; data displayed in the plate grid will automatically update to an average of all sites.

Data vi	iew:	V	/ell	arrangem	ent		•							
	01	02	03	04	05	06	07	08	09	10	11	12	Ι.,	
Α														
В														
С				1111.0	11111.0									plate of
D														
E														sites.
F						$\vdash$								mathe
G														maine
н						_								media
														data t
														uala li
														Refer
														tor mo
Monta	ge:	1		x 2 🌲	Time p	oints	s: 1	4	of	6				
	Data vi	Data view: 01 A B C D E F G H Nontage:	Data view:   M     01   02     A   01     B   02     D   02     E   02     F   02     G   02     H   02	Data view:     Well       01     02     03       A     01     02     03       B     0     0     0       D     0     0     0       E     0     0     0       F     0     0     0       H     0     0     0       H     0     0     0       H     0     0     0	Data view:       Well arrangem         01       02       03       04         A            B             C       11111.0            D              F              G              H              Montage:       1       , x       2       , x	Data view:       Well arrangement         01       02       03       04       05         A              B               C       1111.0       1111.0       1111.0            D	Data view:       Well arrangement         01       02       03       04       05       06         A       Image: 1       Image: 1	Data view:       Well arrangement       ▼         01       02       03       04       05       06       07         A       A       A       A       A       A       A         B       B       B       B       B       B       B       B       B       C       C       1111.0       C	Data view:       Well arrangement       •         01       02       03       04       05       06       07       08         A       Image: 1       Image: 1	Data view:       Well arrangement       ▼         01       02       03       04       05       06       07       08       09         A       0       0       0       0       0       0       0       0         B       0       0       0       0       0       0       0       0         D       0       0       0       0       0       0       0       0         E       0 <td< td=""><td>Data view:       Well arrangement       ▼         01       02       03       04       05       06       07       08       09       10         A       Image: 1       Image: 1</td><td>Data view:       Well arrangement       ▼         01       02       03       04       05       06       07       08       09       10       11         A       Image: 1       Image:</td><td>Data view:       Well arrangement           01       02       03       04       05       06       07       08       09       10       11       12         A       Image: 1       Image:</td><td>Oata view:       Well arrangement           01       02       03       04       05       06       07       08       09       10       11       12         A       Image: 1       Image:</td></td<>	Data view:       Well arrangement       ▼         01       02       03       04       05       06       07       08       09       10         A       Image: 1       Image: 1	Data view:       Well arrangement       ▼         01       02       03       04       05       06       07       08       09       10       11         A       Image: 1       Image:	Data view:       Well arrangement           01       02       03       04       05       06       07       08       09       10       11       12         A       Image: 1       Image:	Oata view:       Well arrangement           01       02       03       04       05       06       07       08       09       10       11       12         A       Image: 1       Image:

If **All Sites** are enabled, data in the plate grid is an <u>average</u> of all the sites. To view data as another mathematical operation (i.e. sum, median, etc.), you must export the data through **Plate Data Utilities**. Refer to corresponding chapters for more details.





#### Configuring Visual Tools – Heat Map

Heat maps are a visual way of assessing patterns in the data

- Enable **Show Heat Map** in order to display a color map based on the values
- Configure the heat map by clicking on the **Heat Map** button
- Default heat map schema is Green-Red with low values displayed in green and high values displayed in red

\*NOTE\* This option is not available when the Data view has been changed to Measurement vs. Well

Wavelengths:	Data view: Well arrangeme	int 👻	Print Table		
✓         DAPI           ✓         Cy5 (Alexa 647)           Sites         All Sites           1         2           2         -	01         02         0           A         A         A           B         B         A           C         D         A           F         454.0         441.0         445           G         389.0         421.0         356           H         395.0         394.0         335	3       04       05       06       07       08       09       10       11       12         4 <t< th=""><th></th><th>Heat Map Scale © Linear © Logarithmic Range @ Automatic</th><th>Color Range Green-Red Green-Blue</th></t<>		Heat Map Scale © Linear © Logarithmic Range @ Automatic	Color Range Green-Red Green-Blue
Legend Not acquired Acquired, not measured Displayed well Part of montage Selected wells	Montage: 1 Ax 2 A			Data Min and Max     Data range (# of SD's): 3.5 Lower: 339 Upper: 454     Manual     Min 339     Max 454	Rainbow     Cold to Hot     Monochrome     Invalid Color     Select
Display Run Analysis M Analysis: Count Nucl Measurement: Total Nucle Select Wells Based On Va Value is: Between •	easurements Graph   ei: Count Nuclei-Trz ei (CountNuclei) ariable Range 240	I and 270	ap Heat Map	OK	Cancel
Data Log Not Open		Configure Log	Open Log		MOLEC



#### Configuring Visual Tools – Significant Digits

The number of significant digits displayed in the plate grid can be configured from the **Display Format** drop-down menu. This can be useful when viewing measurements where integer values (i.e. nuclear count) are more appropriate.

\*NOTE\* This option only changes how the data is displayed and does not affect raw data

Display Run Analysis Measurements Graph	
Analysis: Count Nuclei: Count Nuclei-Tra 🔻	Show Heat Map Heat Map
Measurement: Total Nuclei (CountNuclei)  Select Wells Based On Variable Range Value is: Between  240	Display Format: #.## # # #.# #.# #.## #.###
Data Log Not Open	Configure Log





### **Configuring Visual Tools – Filtering Values**

Use the section under **Select Wells Based on Variable Range** to highlight wells (green) that fit user defined criteria for the displayed measurement.

- Disable Show Heat Map
- Select an operand from the Value is drop down menu
- Enter desired filter criteria
- Click on the Select button
- Values that meet the criteria will be highlighted in green in the plate grid
- Changing the displayed measurement does not change the highlighted wells
- To update the selection click on the Select button
- To clear the selection click on the Clear Selection button



\*NOTE\* This option only selects wells in the plate map and does not affect exporting of data





#### Logging Data to an Excel Spreadsheet

Data can be logged to an Excel spreadsheet in the exact format displayed in the Data View

- Change Data view to Well arrangement to log one measurement in plate format
- Change Data view to Mea Well to log all data in colur

Transfluor Agonist C\_PRICKERT-UCLT1\_18

330503.49 256560.11

02

C 100168.68 182437.85 319358.20 10095

95582.36 111480.19 319911.11 78227

03

359982.12

74675

Data view: Well arrangement 01

A

B

Review Plate Data -

Select Plate .... Wavelengths:

V DRAQ5

FITC

	-	Darcouc								
uromont vs	2	Plate Name	2	Trans	fluor	Agon	ist C			
urement vs	3	Plate ID			11					
n format	4	Description		12 w	ell de	mop	late			
internat	5	Acquisition	User	Syste	m Ad	minis	trator			_
	6	7 Step		'	1					
	7	Measureme	nt	Colle	Dit Int	tograt	ted Inte	nsity (T	ransflue	(r)
	,	wiedsurenne	inc	cen.		regra		insity (in	ansnuc	.,
	8				1		2	3		4
Print Table	9	A		3305	03.5	2565	60.1 35	<b>9982.1</b>	74675.	98
	10	В		9558	2.36	1114	80.2 31	9911.1	78227.	67
	11	С		1001	68.7	1824	37.9 31	9358.2	100953	.2
	12									
	40	-			-					_
	13									
		A	E	3	C		D	E	F	G
	1	Barcode	N/A							
	2	Plate Name	Transfl	uor Ago	nist C					
	3	Plate ID		11						
	4	Description	12 we	12 well demo plate						
	5	Acquisition User	System	n Admin	istrator					
	6	Z Step		1						
	7		Cell: Pi	it Aver (	Cell: Ve	sicle Cc	Cell: Vesicle	Cell: Vesi	Cell: Vesio	Cell: Nu
Print Table	8	A01	23640	.27862	5.4	196063	20.534861	611135	26324.61	370.651
	9	A02	23395	.24921	6.6	596246	39.466719	1220901	28682.28	257.349
e (e) (e) (e) (e) (e) (e) (e) (e) (e) (e	10	A03	1801	6.8308		21.85	40.51443	893184.4	21071.52	293.766
En Range	11	A04	15901	.73315	2.5	539326	7.970472	172801.8	14842.51	294.881
The sea	12	B01	17298	.99085	2.8	865385	9.617447	222003.9	16389.94	295.423
oun (C F	13	B02	18029	.63934	3.0	055363	8.696693	200332.9	16618.96	296.417
C S S S S S S S S S S S S S S S S S S S	14	B03	18231	.77556	20.6	540845	47.340034	1111073	22728.89	287.89
	15	B04	16999	.33155	2.2	286713	7.974923	177164.3	15091.11	280.500
17.95 Low Pressure 37.0L	16	C01	16758	.32707	3.0	004098	10.086585	232870.6	17047.85	290.984
21.6U Low Pressure 36.9U	17	C02	17062	.65451	5.2	283871	9.966804	231913.8	20645.57	328.12
72.62 Low Pressure 37.00	18	C03	18807	.94118	18.1	11475	42.636616	1018476	23044.03	291.614
	19	C04	17511	.07823	3.2	261017	9.915845	228234.1	17919.31	275.048
	20									

A

NI/A

1 Barcode

C

D

F

F

Select Plate	EX4Ce	Morphol	ogy_AMSN\	L-COH8K	V1_4			
Wavelengths:	Data v	iew: Me	asurement v	s Well	<b>-</b>		Print Ta	able
☑ DAPI ☑ Cy5 (Alexa 647)		Total Nuclei (CountNuclei)	Total Area (CountNuclei)	Mean Area (CountNuclei)	egrated Intensity (CountNuclei)	rerage Intensity (CountNuclei)	CO2 Pressure tus (CountNuclei)	Temperature
Sites All Sites	F01	454.00	65351.45	143.95	12245607936.00	₹ <sup>-</sup> 14517.95	Low Pressure	37.00
1 2	F02	441.00	61565.43	139.60	1766322944.00	12121.60	Low Pressure	36.90
1 4	F03	449.00	64789.95	144.30	1943333888.00	12672.62	Low Pressure	37.00
	F04							



#### Logging Data to an Excel Spreadsheet

To log data to an Excel spreadsheet:

- Click on the **Configure Log** button to configure headers (i.e. Plate info, Column and row labels)
- Click on the Open Log button and enable Dynamic Data Exchange (DDE)
- In the **Export Log Data** dialog
  - Select Microsoft Excel from the Application drop-down menu
  - (Optional) Enter a name for the Excel sheet
  - (Optional) Enter Starting Row / Starting Column
  - Click OK
  - This step only opens and links to the Excel spreadsheet. It does not actually export values to the sheet. X Configure Log

Display Run Analysis Measurements Graph Analysis: Count Nuclei: Count Nuclei-Trz  Measurement: Mean Area (CountNuclei) Select Wells Based On Variable Range	Show Heat Map Heat Map Display Format: #.##	ate info olumn and row labels OK Close	
Value is: Between   400  Automatic and 401  Data Log Not Open	Select Configure Log Open Log Log Me Dy At	Data Log Export Log D Application: Application: Sheet Name Starting Row Starting Colu	Vata Microsoft Excel  Enter Name OK Cancel mm. 1 Default
			DEVICE



#### Logging Data to an Excel Spreadsheet

While the Excel spreadsheet is open and connected to MetaXpress

- Click on the Log Data button to export the data displayed in the Data View to Excel
- To log another measurement (except in **Measurement vs Well** view), select the appropriate **Measurement** from the drop-down menu
- Each time you click on the **Log Data** button, the new values will appear below the previously exported data in the Excel spreadsheet and will not over-write existing data as long as a connection is maintained with MetaXpress

Display Run	Analysis Measurements	Graph				
Analysis:	Count Nuclei: Count Nucle	i-Tra ▼			Show Heat Map	Heat Map
Measurement:	Mean Area (CountNuclei)	•			Display Format:	#.## 🔻
Select Wells	Based On Variable Range					
Value is: Be	etween 🔻	400	and	401		Select
Data Log: DDE	Арр				Configure Log	Log Data





#### Logging Data to an Text File (.log)

Data can also be logged to a text file (.log). This method is suggested if logging many data points as Excel has a row limit or if logging cell-by-cell data

- Click on the Configure Log button to configure headers (i.e. Plate info, Column and row labels)
- Click on the Open Log button and enable A text file and click OK
- A Windows navigation pane will open
  - Navigate to the desired location / folder
  - Enter a name for the text file
  - Click on the **Save** button. This step only creates the text file.
  - Log data as described in the Excel spreadsheet section

		Configure Log
Display       Run Analysis       Measurements       Graph         Analysis:       Count Nuclei: Count Nuclei-Trz         Measurement:       Mean Area (CountNuclei)         Select Wells Based On Variable Range         Value is:       Between	Show Heat Map Heat Map Display Format: #### and 401 Select	Plate info Column and row labels OK Close
Data Log Not Open	Configure Log) Open Log	Open Data Log Log Measurements to: Dynamic Data Exchange (DDE) A text file
13		OK Cancel

\*NOTE\* The .log file must remain closed while logging data. If you open the file through Windows, data will not be logged. To stop logging data, in the menus click on **Measure**, **Log**, **Close Data Log** 

Save in:	Desktop		•	0 3	P	
Cent Places	Cor Syst	<b>nputer</b> em Folder				
Desktop	Net Syst	work em Folder				
	Sho 1.35	a Imaging Series 7 rtcut KB				
	Sho 1.29	aXpress 5 rtcut KB				
Computer	Sho	aXpress 6 rtcut				
Network	File name:	Test:LOG			-	Save
NELWOIK	Save as type:	.LOG			-	Cancel



#### Logging Cell-by-Cell Data

Review Plate Data -									
Select Plate	EX4Cell	Morphole	ogy_AMS	NVL-COH	BKV1_4				
Wavelengths:	Data vie	ew: We	ll arranger	ment	•	]			Print Table
DAPI		01	02	03	04 05	06 0	7 08 09 10	11 12	
V Cy5 (Alexa 647)	Α								
	В								
	С				$\square$	$\square$			
Chan	D				$\square$		+ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$	_	
V All Sites	E	101.70	000.07	170 57	$\vdash$	$\vdash$			
	F	434.70	329.87	470.57	$\vdash$	$\vdash$	+ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$		
12	Li I	256.17	521.72	472.05	$\vdash$	$\vdash$	+ $+$ $+$ $+$		
	н	662.72	515.32	472.61				1	
2									
Legena									
Not acquired									
Acquired, not measured									
Displayed well     Part of montage									
Selected wells									
		_							
	Montag	e: 2 🍦	x 4 🌲						
Display Run Analysis Meas	urements	Grap	h						
Analysis: Transfluor: Tra	Analysis: Transfluor: Transfluor Vesicles  Heat Map								
Measurement: Cell: Pit Average	e Intens	ity (Trar	•				Displa	v Format:	### -
Select Wells Read On Varial	le Pane								
Select wells based On variat	ble hang	e							
Value is: Between 💌		40	0	and	401		<b>•</b>		Select
Data Log Not Open							Configur	e Loa	Open Log
							Connigui		shournað
Load Selected Images					Navig	ate Se	elections		Clear Selection
Reset Image Displays	ellular Re	sults						(	Close
									V

For data sets that have multiple sites, data can be logged one site at a time or for all sites.

	Cell: Vesicle Count (Transfluor)	Cell: Vesicle Total Area (Transfluor)	Cell: Vesicle Integrated Intensity (Transfluor)	( ^
1	1	40.1375	1.78619e+006	18
2	4	158.86	5.57175e+006	14
3	3	196.04	1.38228e+007	25
4	3	94.2175	3.36536e+006 1.81236e+006	15
5	3	52.39		14
6	2	217.587	1.3787e+007	26
7	5	309.27	1.67814e+007	22
8	3	186.322	1.11943e+007	25 +
•		n		F
01 7 SH	now Cellular Res	ults		

	Cell: Vesicle Count (Transfluor)	Cell: Vesicle Total Area (Transfluor)	Cell: Vesicle Integrated Intensity (Transfluor)	0
1	1	40.1375	1.78619e+006	18
2	4	158.86	5.57175e+006	14
3	3	196.04	1.38228e+007	29
4	3	94.2175	3.36536e+006	15
5	3	52.39	1.81236e+006	14
6	2	217.587	1.3787e+007	26
7	5	309.27	1.67814e+007	2
8	3	186.322	1.11943e+007	25
٠		1		۴
=01 SH	now Cellular Res	ults		

To log Cell-by-cell data (measurements that are preceded by "Cell:"

- Click on the **Cellular results** button to open the **Cellular Results** dialog
- Left-click on a desired well in the thumbnail image montage
   \*NOTE\* DO NOT click in the plate grid as this will only change the wells displayed in the thumbnail montage
- Click on the **Open Log** button
- Follow the instructions as outlined the previous sections for logging data to an Excel or text (.log) file



#### Support Resources

- F1 / HELP within MetaXpress® Software
- Support and Knowledge Base: <u>http://mdc.custhelp.com/</u>
- User Forum: <a href="http://metamorph.moleculardevices.com/forum/">http://metamorph.moleculardevices.com/forum/</a>
- Request Support: <u>http://mdc.custhelp.com/app/ask</u>
- Technical Support can also be reached by telephone:
  - 1 (800) 635-5577
  - Select options for Tech Support → Cellular Imaging Products → ImageXpress Instruments





# **MOLECULAR** DEVICES

#### ADVANCING PROTEIN AND CELL BIOLOGY