# **Curve calibration wizard**

This wizard guides the user through the process of generating a calibration curve based on processed calibration samples. The wizard consists of a series of screens. To move forward to the next screen click "Next", and previous screens can be viewed and edited by clicking the arrow on the top left of the wizard dialog.

# Step by Step guide

### **Open wizard**

To open the wizard, click "Wizards" in the menu bar at the top of the software window and select "Curve Calibration".

#### Introduction

Before proceeding to the next steps of the wizard, several prerequisites are necessary. Processed samples must be present within the main GUI. Make note of an appropriate image selection model and sigma value which will be chosen throughout the course of this wizard.

### Select samples

Processed samples contained in the Sample list within the main GUI are listed here. If samples are present in the main GUI but the the list in this slide of the wizard is blank, the samples must first be processed. For each sample listed:

- Place a checkmark beside the sample if it should be included in the calibration curve.
- If Physical Dose has not been auto-filled, update it from "Unknown" to Grays (Gy) of radiation the sample was exposed to. Note it is only necessary to enter a number in this field, the unit (Gy) should be omitted.
- If Physical Dose has been auto-filled, check its correctness. Auto-filled dose may not be correct if its sample ID is not wellformed.

S ADCI						
Samples	Curves	ADCI Process Queue	Wiza	rds	Settings	Help
				Cur	ve Calibrati	on
Sample	S			Dos	e Estimatio	n

🕞 🐚 Curve Calibration Wizard
Introduction
This wizard will prepare data for curve calibration using samples loaded in ADCI.
You simply need to
<ul> <li>select samples for calibrations (processed samples only)</li> <li>provide image selection model, if applicable</li> <li>specify a SVM sigma</li> </ul>
When the wizard is finished successfully, it will lead you to the 'Create a Curve' dialog with prepared data.
Next Cancel

elect	Samples		
		s to be used as calibration Sa	
		sed samples found in ADCI. C you want to use, load them ii	heck the ones you want to use. If you nto ADCI first.
		Physical Dose	
V	CNLOGyAll		
<b>V</b>	CNL1GyAll	1	
<b>V</b>	CNL2GyAll	2	E
<b>V</b>	CNL3GyAll	3	
	CNL4GyAll	4	

? X

9 9

After these steps have been completed for all required samples, click "next" to move on to the next screen. If a value in the Physical Dose field is invalid, "Physical Dose" will be highlighed in red along with the ID of the sample in the offending line. offending line.

#### Apply image selection model

An image selection model may optionally be applied. If no image selection model is desired, click "next" to move on to the next screen. To use a model, highlight an entry within the list of "Available Image Selection Models". The description of the model, Image Exclusion Filters, and Image Ranking and Inclusion fields will be automatically populated using values from the selected image selection model. To clear a model, highlight "No image selection, using all images" and the fields on this screen of the wizard will be emptied.

oply Image Se	election	
ter images in sample	es by using an image selection model	
	ion, specify a selection model file. Keep the input box empty will be used for dicentric calculation	otherwise.
Selection model to u	use:	
:ognomix/ADCIDE/S	SelectionModels/TestCombinedModel250.adciimageselection	(
Available Imag	e Selection Models	
No image sel	ection, using all images.	
TestCombine	dModel250, LW 1.5, CD 1.5, FD 1.5, Obj [0, Inf]	
TestFilterMod	iel, LW 1.5, CD 1.5, FD 1.5, Obj [40, 60], Seg [3	
TestScoreMo	del, Obj [0, Inf], Score Z 500	
Description of I	the Image Selection Model age model	
-		
-	age model	
Description of im  Image Exclusio  Exclude  Exclude  Exclude  Exclude  Exclude  Exclude  Exclude  Image Ranking	age model If Length-Width Ratio z-score > 1.5 If Centromere Candidate Density z-score > 1.5 If Finite Difference z-score < 1.5 If Dipiect Count < 40 If Segmented Count < 35 If Classified Object Ratio > 0.70	

#### Select an SVM sigma value

For more information on choosing an appropriate SVM sigma value to use please consult the SVM sigma page. As a general recommendation, we have found SVMs based on  $1.4 \leftarrow \sigma \leftarrow 1.6$  maximize the combined true positive rate and positive predictive values compared to manual or ground truth scoring of dicentric chromosomes by experts <sup>1)</sup>.



#### Summary

Ensure your previous selections are correct on

this summary screen. Note values entered on previous screens can be edited by clicking the blue button on the top left of the wizard dialog. Click "Finish" to complete the wizard and bring up the prepopulated "Create a Curve" dialog.

📡 Curve Calil	bration Wizard	
Summary		
Please review vour	setting for Curve Calibration. Proceed if correct	
Samples to use:		
Sample ID	Physical Dose	
CNLOGyAll	0	
CNL 1GyAll	1	
CNL2GyAll	2	
CNL3GyAll	3	
CNL4GyAll	4	
Image selection r	model to use on samples:	
stCombinedMode	el250.adciimageselection	
SVM to use on Sa	amples: Sigma 1.5	
	Einish	Cancel

## Prepopulated create a curve dialog

The create a curve dialog has been prepopulated based on your selections during the wizard. To finalize the creation of the curve, it is only necessary to provide a unique ID for the curve, validate the data, and click "OK". Although it should not be necessary for completion of this dialog since it has been prepopulated by the wizard, more information on its contents can be found under the "Generate curve based on processed calibration samples" heading within the calibration curve page.

 Specify an unique identify for the new curve

A name for the curve to be created. This identifier will appear under "Curve identity" within the list of curves in the main GUI.

#### • Validate data

Data within the dialog must be validated before "OK" can be clicked. Click "Validate". All cells within the Dose-Response list should turn green. Click "OK" to finalize the creation of the curve.

Click "OK" and save curve
 The curve is now created and has been
 added to the workspace. If you would like
 to save the curve for future use after the
 current session, you can save it now.
 Alternatively, it can be saved later by
 clicking the icon.

peci	ify a unique identity f	for the new curve	
Test	Curve		
dd a	a brief description for	r the curve to be created	
Curv	ve fitting by Maximur	n-Likelihood	
Cur	rve fitting		
SVI	M: Sigma 1.5	•	
App	plied image selection	model	Specify File
Dos	se-Response data		
	Dose	Response (DC/Cell)	Cells (Images)
	Dose		
1	0	0.256892	798
1 2			798 841
F	0	0.256892	798
2	0 1 2	0.256892 0.307967	798 841
2	0 1 2 3	0.256892 0.307967 0.350402	798       841       996
2 3 4 5	0 1 2 3	0.256892 0.307967 0.350402 0.515993	798       841       996       1188
2 3 4 5	0 1 2 3 4 0.5	0.256892 0.307967 0.350402 0.515993 0.538226	798       841       996       1188       1635

#### 1)

Peter K. Rogan, Yanxin Li, Ruth C. Wilkins, Farrah N. Flegal, and Joan H. M. Knoll Radiation Dose Estimation by Automated Cytogenetic Biodosimetry Radiat Prot Dosimetry (2016) 172 (1-3): 207-217

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