RayBio® Caspase-Family Fluorometric Substrate Set Plus

User Manual Version 1.0

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RayBio® Caspase-Family Fluorometric Substrate Set Plus Protocol

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I. INTRODUCTION

Storage Conditions: Store at -20C
Shelf Life: 6-12 months under proper storage conditions

II. KIT CONTENTS: each of the following substrates is dissolved in DMSO

Concentration	Description	Volume	Part Number
1 mM	Caspase-1 Substrate, Ac-YVAD-AFC	125 µl	Part A
1 mM	Caspase-2 Substrate, Ac-VDVAD-AFC	125 µl	Part B
1 mM	Caspase-3 Substrate, Ac-DEVD-AFC	125 µl	Part C
1 mM	Caspase-5 Substrate, Ac-WEHD-AFC	125 µl	Part D
1 mM	Caspase-6 Substrate, Ac-VEID-AFC	125 µl	Part E
1 mM	Caspase-8 Substrate, Ac-IETD-AFC	125 µl	Part F
1 mM	Caspase-9 Substrate, Ac-LEHD-AFC	125 µl	Part G
N/A	Cell Lysis Buffer	100 ml	Part H
N/A	2X Reaction Buffer	20 ml	Part I
1 M	DTT	0.4 ml	Part J

III. ASSAY PROCEDURE

1. Induce apoptosis in cells by desired method. Concurrently incubate a control culture *without* induction.
2. Count cells and pellet 1-5 x 10^6 cells or use 50-200µg cell lysates if protein concentration has been measured.
3. Resuspend cells in 50 µl of chilled Cell Lysis Buffer.
4. Incubate cells on ice for 10 minutes.
5. Add 50 µl of 2X Reaction Buffer and 1 µl DTT to each sample.
6. Add 5 µl of the 1 mM AFC conjugated substrates (50 µM final conc.) into each tube individually and incubate at 37˚C for 1-2 hour.
7. Read samples in a fluorometer equipped with a 400-nm excitation filter and 505-nm emission filter. For a plate-reading set-up, transfer the samples to a 96-well plate. You may perform the entire assay directly in a 96-well plate.

Fold-increase in caspase activity can be determined by comparing these results with the level of the uninduced control.

IV. GENERAL TROUBLESHOOTING GUIDE

Problems	Cause	Solution
Assay not working	• Cells did not lyse completely	• Resuspend the cell pellet in the lysis buffer and incubate as described in the datasheet
	• Experiment was not performed at optimal time after apoptosis induction	• Perform a time-course induction experiment for apoptosis
	• Plate read at incorrect wavelength	• Check the wavelength listed in the datasheet and the filter settings of the instrument
	• Old DTT used	• Always use freshly thawed DTT in the cell lysis buffer
High Background	• Increased amount of cell lysate used	• Refer to datasheet and use the suggested cell number to prepare lysates
	• Increased amounts of components added due to incorrect pipetting	• Use calibrated pipettes
	• Incubation of cell samples for extended periods	• Refer to datasheet and incubate for exact times
	• Use of expired kit or improperly stored reagents	• Always check the expiry date and store the individual components appropriately
	• Contaminated cells	• Check for bacteria/ yeast/ mycoplasma contamination
Lower signal levels	• Cells did not initiate apoptosis	• Determine the time-point for initiation of apoptosis after induction (time-course experiment)
	• Very few cells used for analysis	• Refer to datasheet for appropriate cell number
	• Use of samples stored for a long time	• Use fresh samples or aliquot and store and use within one month for the assay
	• Incorrect setting of the equipment used to read samples	• Refer to datasheet and use the recommended filter setting
	• Allowing the reagents to sit for extended times on ice	• Always thaw and prepare fresh reaction mix before use
Samples with erratic readings	• Uneven number of cells seeded in the wells	• Seed only equal number of healthy cells (correct passage number)
	• Samples prepared in a different buffer	• Use the cell lysis buffer provided in the kit
	• Adherent cells dislodged and lost at the time of experiment	• Perform experiment gently and in duplicates/triplicates; apoptotic cells may become floaters
	• Cell/ tissue samples were not completely homogenized	• Use Dounce homogenizer (increase the number of strokes); observe efficiency of lysis under microscope
	• Samples used after multiple freeze-thaw cycles	• Aliquot and freeze samples, if needed to use multiple times
	• Presence of interfering substance in the sample	• Troubleshoot as needed
	• Use of old or inappropriately stored samples	• Use fresh samples or store at correct temperatures until use
Unanticipated results	• Measured at incorrect wavelength	• Check the equipment and the filter setting
	• Cell samples contain interfering substances	• Troubleshoot if it interferes with the kit (run proper controls)
General issues	• Improperly thawed components	• Thaw all components completely and mix gently before use
	• Incorrect incubation times or temperatures	• Refer to datasheet & verify the correct incubation times and temperatures
	• Incorrect volumes used	• Use calibrated pipettes and aliquot correctly
	• Air bubbles formed in the well/tube	• Pipette gently against the wall of the well/tubes
	• Substituting reagents from older kits/ lots	• Use fresh components from the same kit
	• Use of a different 96-well plate	• Fluorescence: Black plates; Absorbance: Clear plates
Note: The most probable cause is listed under each section. Causes may overlap with other sections.		

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