



Handy Helper

Application Note 25

For Colony and Cell Counting Applications GeneTools offers Invaluable Features

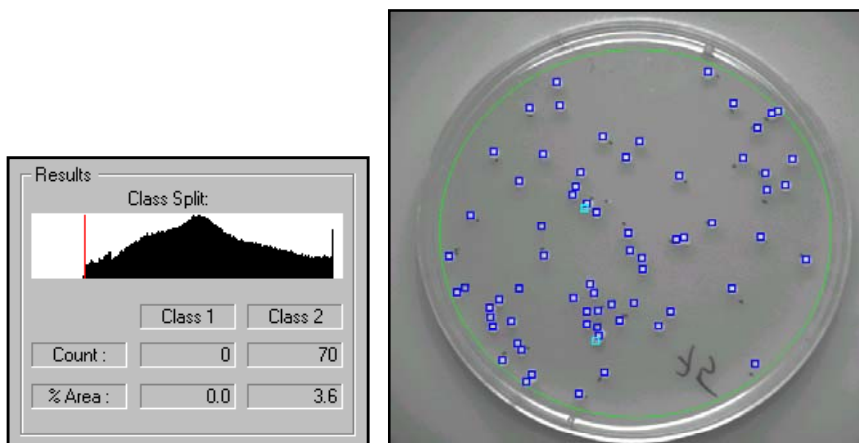
Introduction

When counting colonies or cells using an image analysis system it is vitally important to choose software which is versatile enough to be able to quickly handle routine counting, yet is simple enough to provide as much automation as possible. To guide users, Syngene presents in this application note a selection of ways in which GeneTools, the software which comes as standard with Syngene image capture systems, can help with colony and cell counting. The array of GeneTools applications has been developed by Syngene from many years' experience of producing integrated imaging equipment as well as the consultation and feedback given by many of the international scientists using Syngene systems.

Counting from Agar Plates

GeneTools has a built in function, which allows an automatic count of colonies from a framed circular image in seconds. Since counting is based on a user-defined, adjustable circle, an automatic colony or plaque count can be performed on any size of plate including standard 9cm plates and 15cm library plates. GeneTools shows the results alongside a plate image indicating everything the software considers as a colony, (Figure 1).

Figure 1: GeneTools analysis showing an agar plate of colonies with its associated colony count



GeneTools has a unique auto-separation algorithm, which greatly reduces the need to manually correct counts. Users can adjust the sensitivity to capture more or less colonies in the count according to their needs. The software allows colonies to be differentiated in area limits and size to ensure an accurate count of any plate. In addition, because GeneTools allows users to determine frame size, it means that edge effects such

More/....



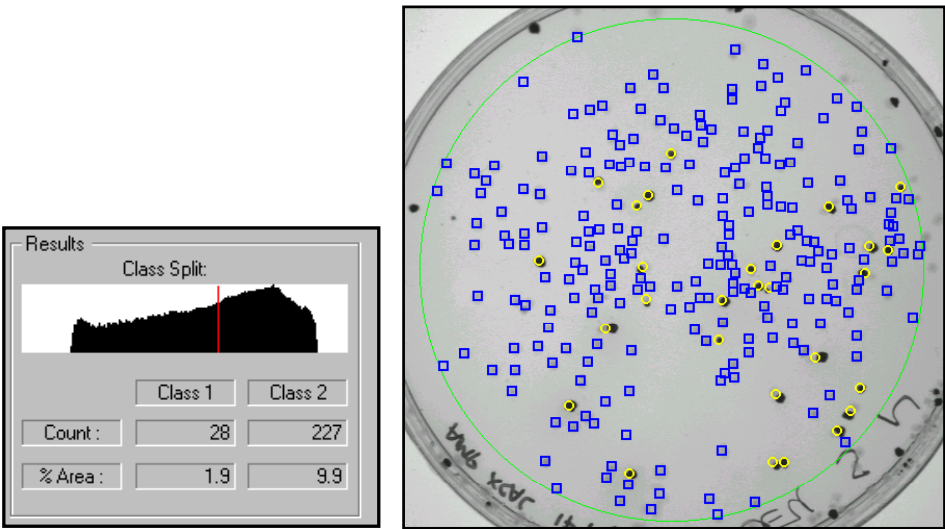
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as bubbles or pen markings can be excluded. Other problem areas within the plate, for example, agar lumps or fungal contamination can also be eliminated from the count by manually drawing around them on screen. It is also possible to manually add and delete colonies, even when using two colours. All these features ensure the count is highly accurate.

Counting Coloured Colonies

When working with chromogenic media and coloured colonies, GeneTools has a class split function, which enables automatic discrimination and counting of, for example, blue and white colonies on the same plate (Figure 2), a feature which many molecular biologists find very useful.

Figure 2: GeneTools analysis showing an agar plate of two different coloured colonies and its related colony count



Determining Cell Numbers in Multi-well plates

Utilising the zoom function of a Syngene image capture system plus GeneTools' adjustable circular frame, users can obtain an image of cells growing in the well of a multi-well plate. GeneTools will then automatically quantify the amount of cell growth in the well in seconds and store the images of the plate well for future reference (Figure 3). This can be useful in, for example, clonogenic assays, (Figure 4).

Figure 3: GeneTools analysis showing cells growing in the wells of a multi-well plate and its associated cell count

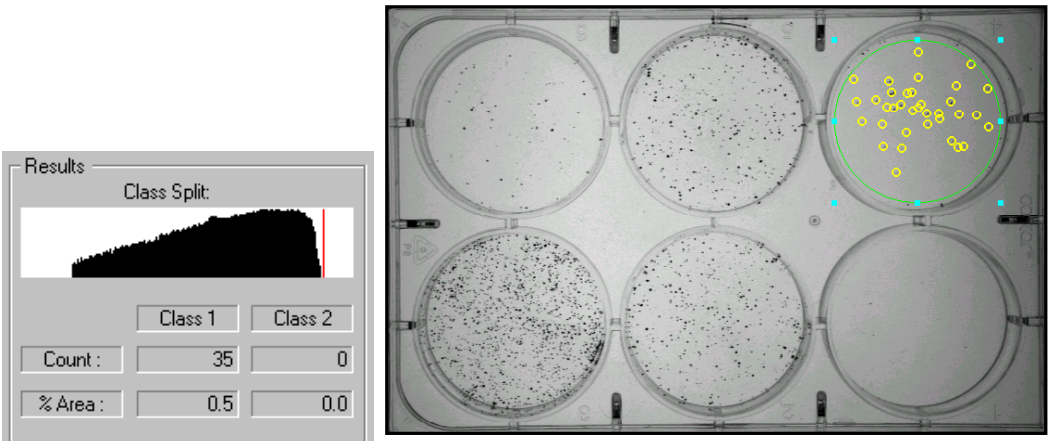
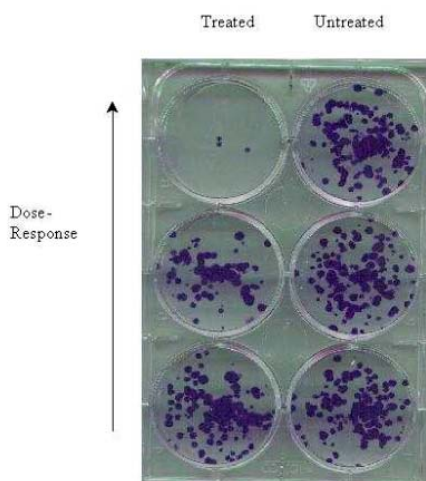


Figure 4: A clonogenic assay showing colonies stained with crystal violet, (kindly provided by AstraZeneca, Macclesfield, UK)



Incidence analysis

GeneTools has a sophisticated spot analysis capability that can analyse microtitre plate wells. Images of microtitre plates are produced using Syngene's microtitre prism and this ensures images of clear circular wells within the plate's image. GeneTools can then be programmed to find positive or negative results with parameters that are defined by the user.

The results are displayed simultaneously in one window as a microplate image above an incidence table where positive and negative results are shown as a one or a zero respectively. Results from the spot analysis can be immediately transferred to Excel spreadsheets or saved as text files for archiving and use in reports.

Conclusions

The flexibility, GLP compliance and the availability of upgrades are all factors that potential users should consider when choosing image analysis software. GeneTools scores very highly in all of these areas. It is so versatile that as well as colony and cell counting, it can also be used for a range of DNA/RNA and protein gel and blot applications. It is fully GLP compliant, with each analysed set of results being assigned a unique identity number so that even a re-analysed sample can be detected. In addition, Syngene provides all GeneTools software upgrades for life, free of charge to guarantee that GeneTools users will always have access to the most current application features. These benefits combined with Syngene's expert advice, makes using GeneTools an extremely attractive option for many busy life science laboratories.