AMORPHOUS CARBON PLATE

Nippon's mission is to build bridges between Japanese and European research life science markets to increase the availability of the most recent life science tools which leads to more efficient and specific drug development which can save lives and contribute to a more sustainable health economy.

Well plates

The Well plate has become a standard tool in analytical research and clinical diagnostic testing laboratories. A common method in which these well plates are used is ELISA. The microplate may seem unimportant but life would be different without the micro well plate. The well plates are used in microbiology, virology, serology and other life science and drug discovery laboratories. The well plate is a cost-effective, time-saving and simply operating tool used across the world.

Problem 1:

The microplates can be made from a variety of materials, the most common is polystyrene. The microplates are available in several colors such as white, black and transparent. One needs to think ahead when performing a particular assay when using a microplate. White pigmented microplates are for example suited for optical absorbance or luminescence detection, while black pigmented microplates are perfect for fluorescent biological assays and transparent microplates perform best for optical characteristics for colorimetric assays and are often used for cell culture. Autofluorescence can interfere with the outcomes of such assays and therefore accurate values are often difficult to obtain.

Problem 2:

Protein assays are often performed with the use of well plates. A lot of background signals can subvert the actual data needed for research. One such background signal is non-specific adsorption of proteins. Proteins can attach to the surface of the plate and prevent binding of the sample thereby blocking the correct signals of the sample.

Problem 3:

Well plates are often used for biomolecule immobilization. Coating of the surface and the inherent immobilization strategy of the biomolecules are often difficult due to the solid support of the well plate.

Nippon Health Innovations Europe

Introducing the Amorphous Carbon plate

Amorphous carbon is an ideal material for detecting protein. Autofluorescence is very low when using amorphous carbon plates (figure 1). A 10 times lower autofluorescence value is measured in comparison with a plate made of plastic like polystyrene.

Amorphous carbon plates also have a very high sensitivity detection (figure 2). The non-specific adsorption of proteins is lowered and therefore less amount of background signal is interfering with the exact values of the sample.

The amorphous can also encount for the difficult surface coating needed for biomolecule immobilization by attached functional groups to the carbon. Functional groups such as carboxyl groups, and amino groups can already be covalently bound to the surface of the well and if needed further derivatized.

The well plate is further easy customizable, and chemically stable. The amorphous carbon plate is also reusable.

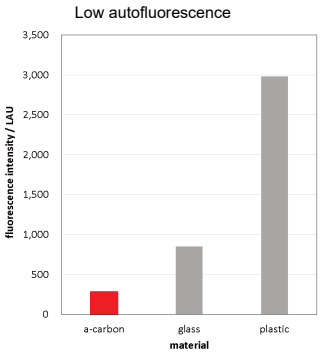

Figure 1: Autofluorescence of plate materials.
Measurement instrument : FLA8000
ex. 532nm, em. 570nm

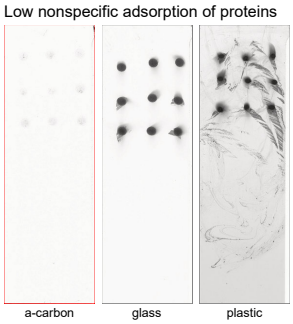

Figure 2: Nonspecific adsorption of protein. Solution of fluorescently labelled BSA contained in PBS was dropped at nine places on the plate surface, and then dried up. Detection of fluorescence was carried out after washing with deionized water and spin-drying.

***Photo.* Amorphous carbon plate**
Size : almost same as microtiter plate
Surface modification :1536 spots of amino functional group

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