LSC in Practice

Sample Preparation of Sheep Plasma for Liquid Scintillation Counting

Problem

A researcher had been using PerkinElmer's Biological Sample Preparation Guide in an attempt to process sheep plasma samples.

The samples were labeled with ^{3}H and ^{14}C. The current procedure called for 0.1 mL or 0.2 mL of plasma with 0.5 mL of deionised (DI) water in 15 mL of ULTIMA Gold™ (part number 6013329). After several hours, the samples would turn cloudy and separate.

The researcher requested our help to refine her sample preparation technique or recommend conversion to an alternate cocktail.

Discussion

PerkinElmer's sample preparation guide does recommend the use of ULTIMA Gold for plasma and serum samples. However, it should be noted that results can vary when biological fluids are encountered from a genus different than those used during initial testing. In this case, our testing had been performed using readily available human plasma and serum, while the researcher was using sheep plasma, which is not available to our laboratories.

Our experience has shown that biological fluids from certain animals can be problematic and it appears that sheep fall into this category.

Recommendation

We recommended several sample preparation modifications. These alternate techniques are listed below:

1. Add 0.1 or 0.2 mL of Soluene®-350 to 0.1 or 0.2 mL of sheep plasma, and let stand at 50 °C for about 15 to 30 minutes for complete digestion. Then add 15 mL ULTIMA Gold.
2. As with other difficult sample preparation techniques that call for DI water, the addition of 0.5 mL of 10 mM PBS, pH 7.2, buffer may overcome the cloudiness and separation difficulties.
3. As an alternative to modification #2 (above), you may substitute 0.5 mL of 10 mM PBS buffer, pH 7.2, prepared in water/ethanol (1:1).

With many biological fluids, modification #1 may be sufficient to solubilize the proteins and prevent the development of cloudiness and separation difficulties.

Modifications #2 and #3 are not as severe as #1 but have been known to stabilize the proteins and therefore, prevent cloudiness/separation.

If none of these modifications successfully resolve the sample preparation problems, it may be necessary to change to another cocktail. If this becomes necessary, then we recommend PerkinElmer's Pico-Fluor™ 40 (part number 6013349) or Hionic-Fluor™ (part number 6013319).

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