Utility of Dried Blood Spot Sampling and Storage for Increased Stability of Photo-Sensitive Compounds

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Compound stability remains a major point of concern within pharmaceutical development. In attempts to minimize degradation, scientists may utilize acidification of samples prior to storage, dark chambers, decrease freezer temperatures and a variety of other stabilization techniques. All of these steps require additional procedures, increased costs, and increased validation steps. Dried Blood Spots (DBS) is becoming a popular alternative to plasma sampling in many small and even large molecule applications. An investigation was performed in order to establish if DBS would provide storage advantages over liquid based matrices for two light sensitive compounds, nifedipine and omeprazole, to prevent or minimize photo-degradation.

Experimental data has shown, through forced and natural photo-degradation experiments that the compounds nifedipine and omeprazole exhibit increased photo stability when spotted and stored on various DBS paper, when compared to water, plasma or whole blood. For omeprazole, between 40 – 90% loss was observed in liquid matrices, while photo-degradation was negligible when utilizing DBS. Some loss of nifedipine is noted during exposure conditions on DBS, however photo-degradation in liquid matrices is far more severe.

Within the experimental compound set, DBS technology offers significant reduction in the photo-degradation process when compared to the liquid matrices water, plasma or blood.