

Dried blood spot microvolume sampling for DMPK

Cutting the cost of generating PK/TK data

Pharmacokinetic (PK) and toxicokinetic (TK) studies provide crucial insight into how drug candidates behave in the body and are, therefore, a critical step in drug development.

These analyses traditionally require large volumes of blood (generally 100–500 μ l per subject per time-point) in order to provide sufficient plasma volume for quantitative bioanalysis. Because only a limited number of serial samples can be taken from each animal, composite sampling is often used, resulting in lower quality PK data and an increase in the number of animals required. Large volumes also make it difficult to conduct studies in juvenile subjects.

Additionally, the plasma must be isolated from whole blood and prepared for bioanalysis using solid phase extraction, liquid-liquid extraction, or protein precipitation. This time-consuming process limits throughput and consequently the number of samples that can be tested.

Finally, there are the practical challenges of shipping and storing blood samples, which require controlled handling and frozen transportation and storage.

The Dried Blood Spot (DBS) method is an alternative technique that overcomes these drawbacks and delivers significant cost savings.

Spot. Extract. Analyze.

- Apply blood to card (Fig 1.) and let dry. Ship and store as needed at ambient temperature.
- Remove sample disc (Fig 2.) and elute with solvent.
- Analyze solution by HPLC-MS/MS.



Fig 1. Apply sample



Fig 2. Punch disc

DBS microvolume sampling using specialized Whatman™ media from GE Healthcare has been shown to be both precise and accurate for a variety of compounds from different structural classes with acceptable inter- and intra-assay variability and is now being routinely employed in PK/TK studies. The FTA™ DMPK-A and FTA DMPK-B cards lyse cells and denature proteins on contact. Samples can be shipped and stored at ambient temperature and long-term stability has been demonstrated for analytes and metabolites sensitive to plasma enzymes.

Low blood volumes

- DBS microvolume sampling requires only 10 to 20 μ l per sample.
- Fewer experimental animals are required because toxicokinetic data is derived from toxicology animals, thereby eliminating satellite colonies.
- More consistent data is obtained through more serial sampling from individual animals and less reliance on composite data, further reducing the number of animals needed.
- Juvenile animals and humans can be studied.



Simple and safe processing

- The 3-step DBS procedure is much more straightforward than the cumbersome centrifugation, isolation and clean up of plasma.
- On-substrate clean up has the potential to convey greater analyte stability, especially for enzyme-sensitive compounds.

Easy storage and transportation

- Room temperature stability saves on cost of dry ice shipments.
- Shipping without dry ice makes it simpler and more cost effective to carry out remote sampling, or clinical studies.

Getting started

The choice of DMPK card depends on many factors such as the analyte chemical structure, extraction solvent and analysis workflow. The final decision is usually determined empirically.

Want more information?	Ready to order?	Need specific advice?
Visit our website where you will find references and protocols	Products and accessories to get you started are listed below	Contact our experts to discuss details
www.whatman.com/dmpk.aspx	Contact your local office	dmpk@ge.com

Ordering information

Description	Pack size	Catalog number
FTA DMPK-A Card	100	WB129241
FTA DMPK-B Card	100	WB129242
FTA DMPK-C Card	100	WB129243
FTA DMPK Starter Pack	45 cards (15 x A, B and C)	WB129248

Accessories for punching and drying

Description	Pack size	Catalog number
Harris Uni-Core Punch 3.0 mm	4 (with cutting mat)	WB100039
Harris Micro-Punch 3.0 mm	1	WB100038
Replacement Cutting Mat, 5-7/8" x 7-7/8"	1	WB100020
Dry Rak (without Velcro™)	10 (holds 11 cards/rack)	10537173
Dry Rak (with Velcro)	10 (holds 11 cards/rack)	10539521

Accessories for storage and shipping

Description	Pack size	Catalog number
Zipper Sealed Storage Bags, 4"x6"	100	10548232
Foil Barrier Zipper Sealed Storage Bags	100	10534321
Desiccant Packets (indicating), 1g	1000	WB100003
Glassine Envelopes, 3-1/4" x 4-7/8"	100	10548236
Biohazard Labels, 7/8" x 7/8"	1000	10534150

Contact information

For more information please contact your local sales representative or your local office.

www.gelifesciences.com/whatman

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