Making Science Work Against the Logistical Challenges

IATA Compliant Transport for Streck Cell-free DNA Blood Collection Tubes

Cell-free DNA (cfDNA) detection promises a non-invasive, rapid and sensitive tool for molecular diagnosis and monitoring of acute pathologies, as well as prenatal diagnosis of foetal genetic diseases.

This field is emerging as one of the most promising and exciting areas of medicine and has already made a huge impact on prenatal care, enabling non-invasive prenatal testing and diagnostics.

Non-invasive detection of cfDNA can impact clinical protocols and treatment regimens, determining the standard of care in oncology, transplant medicine and cardiovascular disease.

In translational cancer research, diverse clinical applications of tumour-derived cfDNA detection and analysis include tumour mutation monitoring, long term surveillance of the disease and treatment response.

Accurate quantification of cfDNA

However, in both cancer patients and pregnant women, the cfDNA (tumoral or foetal) constitutes less than 10% of the total plasma DNA. Accurate quantification of cfDNA requires minimisation of circulating tumour DNA (ctDNA) degradation and prevention of genomic DNA (gDNA) release from white blood cells, following blood draw, sample storage and shipping.

Stabilise Nucelated Blood Cells

Cell-Free DNA BCT® from Streck is a blood collection tube with a preservative stabilising nucleated blood cells. This unique stabilisation prevents the release of gDNA, allowing isolation of high-quality cfDNA, which can be further used for a wide range of downstream applications such as non-invasive prenatal testing (NIPT) and liquid biopsies.

It has also been demonstrated to minimise the degradation of circulating tumour cells (CTCs).

Cell-Free DNA BCT reduces the need for immediate plasma preparation and CTC processing due to its unique stabilisation properties. CfDNA and gDNA are stable for up to 14 days at 6°C to 37°C, while CTCs are stable for up to 7 days, at room temperature, allowing convenient sample collection, transport and storage. Enhanced stability and recovery of cell-free plasma DNA minimises variability associated with cfDNA sample preparation.

Find out more at www.alphalabs.co.uk/bct

Blood Transport Regulations

Blood samples often need to be transported between clinic and laboratory, but as they are potentially pathogenic, are subject to the Dangerous Goods Regulations (DGR). They are classified within the DGR as Biological Substances, Category B and assigned the shipping number UN3373. For transportation, they must be packaged according to the IATA (air transport) or ADR (transport by road) Packing Instructions 650.

Category B sample packaging must consist of three components: the leak-proof primary receptacle (blood tube/universal container), a leak-proof secondary packaging (sealed plastic bag or rigid container) plus an outer packaging (cardboard box or mailing envelope).

For ADR, the primary or secondary packaging must pass the 95kPa pressure differential test conducted at an ambient temperature. The entire package, with its three layers, must withstand a 1.2m drop test without any damage to the primary container, and either the secondary or outer layer of packaging must be rigid. Sufficient absorbent material must also be included to absorb all of the sample volume.

When sending multiple samples in one package, each primary container must be individually wrapped or separated so they do not contact each other directly.

Samples being sent under UN3373 Category B, Biological Substance, should also display the appropriate symbol, i.e. a diamond shaped mark containing "UN3373" in letters at least 6mm high.

Additional requirements relate to the IATA requirements. The same 95kPa pressure differential test applies, but the container, whether primary or secondary, must pass this test at both -40°C and 55°C. Maximum volume (1L) and weight (1Kg) limits apply to the primary and outer container (4L or 4kg). The outer packaging layer must be rigid and contain an itemised list of contents. The UN3373 diamond symbol must be at least 50mm along each side of the diamond shape, and the outer packaging must be at least 100mm x 100mm in size.

IATA Compliance

Following pressure differential testing performed per IATA UN3373 standards, Cell-Free DNA BCTs have been certified fully 95kPa IATA compliant. This means they can now be paired with the unique SpeciSafe® packaging solution for convenient transportation.

SpeciSafe® for Convenient Compliance

SpeciSafe all-in-one secondary packaging system combines ultra-absorbent material bonded to a rigid container with built in tube separation. Together with a padded envelope or bag as the outer packaging for road transport, or a rigid outer box for air transport, these mailing packs offer a perfect, compliant solution for transportation of Cell-Free DNA BCTs containing blood samples.

Find out more at www.UN3373.co.uk

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