Creative Bioarray

Parallel Artificial Membrane Permeability Assay (PAMPA)

Parallel artificial membrane permeability assay (PAMPA) is a non-cell-based assay designed to predict the passive transcellular permeability of compounds in early drug discovery.

Passive diffusion is an important way for drug absorption. It affects drugs pass through the intestinal epithelium, the blood-brain barrier or transport across cell membranes. Typically, PAMPA experiments are carried out in the early stages of drug discovery to select leads with promising oral bioavailability/brain penetration potential in a cost-effective manner. By combining the data generated in PAMPA with more labor-intensive cell-based permeability assays, it is possible to efficiently guide quick structural modifications of discovery compounds to improve their *in vivo* characteristics.

Depending on the lipid and buffer used, PAMPA assay can predict gastrointestinal tract absorption (PAMPA-GIT), blood-brain barrier permeability (PAMPA-BBB) or transdermal penetration (Skin-PAMPA). PAMPA provides a simplified method of permeability by addressing just a single transport mechanism. This avoids the complexity of active transport as well as metabolism, and enables ranking of the compounds on a single permeability factor.

Features of PAMPA

PAMPA is used as an *in vitro* model of passive, transcellular permeation.

The ability of this assay to evaluate permeability over a large pH range is of great value for early understanding of how new oral compounds are absorbed across the gastrointestinal tract.

PAMPA avoids the complexity of active transport and allows ranking of test compounds based on a simple permeability property alone.

PAMPA Models Available at Creative Bioarray

▶ Original PAMPA – The lipid solution consists of 10% lecithin in dodecane.

▶ DOPC-PAMPA – The lipid solution consists of 2% DOPC in dodecane.

▶ HDM-PAMPA – The lipid solution is 100% hexadecane.

▶ Bio-mimetic PAMPA (BM-PAMPA) – The lipid solution consists of a mixture of PC, PE, PS, PI and cholesterol in an organic solvent.

▶ Double-Sink PAMPA (DS-PAMPA) – The lipid solution consists of 20% dodecane solution of a phospholipid mixture and the acceptor solution contains a surfactant mixture.

The PAMPA Models Allow Assessment of:

The contribution of passive diffusion in drug absorption

Effect of the pH on permeability

Screening of compounds of interest

Comparison of oral absorption efficiency for various pharmaceutical formulations

Determination of absorption kinetic parameters