

PAMPA - Parallel Artificial Membrane Permeability Assay

The ultimate platform for producing high-throughput permeability analysis. EVOLUTION provides a turnkey system for sample preparation and reading, data analysis, and presentation. For those not ready for full automation, there is the EXPLORER version.

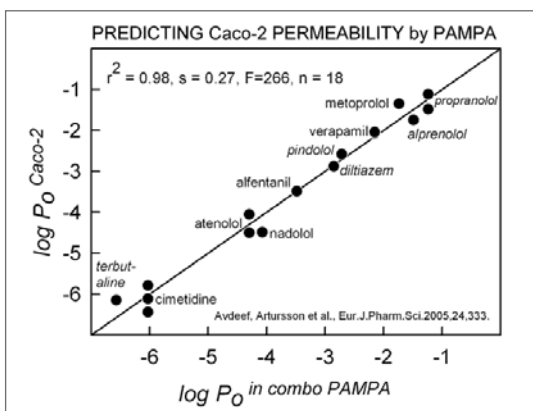
Permeability is often one of the toughest hurdles for a drug candidate to clear. Being either too high or too low is equally a problem.

With variable pH, active and passive absorption as well as lipo- and hydrophilicity to consider, screening large numbers of compounds with cell-based assays is next to impossible to do well.

By utilizing a synthetic model for permeability, ease of operation, flexibility, and reproducibility can accelerate throughput for passive permeability measurements.

No Barriers

Recognition of the capabilities and advantages of PAMPA has grown steadily since it was first introduced in 1998. The cost and complexity of cell based assays is speeding the adoption of PAMPA systems by pharma companies around the globe.



PAMPA vs. Caco-2 Correlation

It is natural that PAMPA is regularly being compared to Caco-2 measurements, which have emerged as the *de facto* standard for permeability analysis.

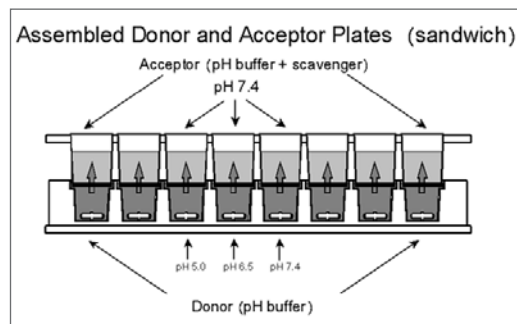
In a recently published study¹ such comparison was done in the most rigorous manner, fully taking into account pH and aqueous boundary layer (ABL) effects for both PAMPA and Caco-2. It is shown that Double-Sink™ PAMPA measure-

ments can directly predict the passive transport component of Caco-2 permeability with $r^2 = 0.93$.

Moreover, using an *in combo* PAMPA model, accounting for differences in physicochemical properties (like lipophilicity and hydrogen bonding) between PAMPA and Caco-2, can predict 98% of the variances in the studied Caco-2 sets¹ (see Figure on the left).

Thus, as a high-throughput and cost effective assay, PAMPA can provide the same information about passive transport as Caco-2, while Caco-2 can be used later for mechanistic permeability studies to reveal such effects as active transport, efflux, etc.

¹ Avdeef, A.; Artursson, P.; Neuhoff, S.; Lazarova, L.; Gräsjö, J.; Tavelin, S. Caco-2 Permeability of Weakly Basic Drugs Predicted with the Double-Sink PAMPA pK_a flux Method. *Eur. J. Pharm. Sci.*, 2005, 24, 333-349.



Why is PAMPA EVOLUTION™ for you?

Simplicity of Operation- PAMPA EVOLUTION puts all the processes and technology necessary for analysis together in one complete package. This means your lab can be up and running permeability samples the moment you plug it in. Since everything is integrated, all the chemist needs to do is load samples and start the robot.

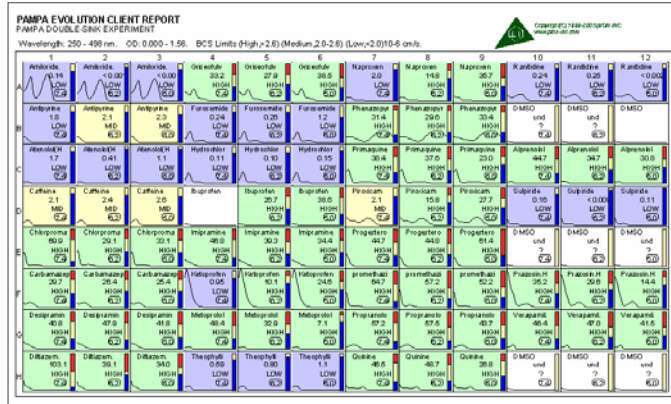
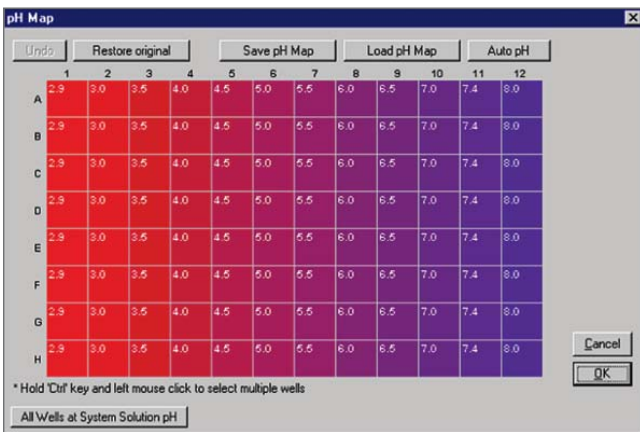
Experimental Flexibility- With features such as pH-Mapping™ and gradient-pH assessment, PAMPA EVOLUTION provides a host of sophisticated features to obtain complex permeability results on all types of drug compounds.

PAMPA has also demonstrated applications beyond oral absorption modeling. Using our instrument, users have developed new techniques for blood-brain barrier (BBB) transfer modeling, skin penetration studies, and DMPK profiling.

Faster Results and Reduced Cost- PAMPA EVOLUTION is capable of analyzing nearly 600 assays per day. And because PAMPA assays are cheaper to run and chemist time is minimized, the overall cost of permeability analysis is greatly reduced. Instead of putting your money in preparation, PAMPA EVOLUTION allows you to invest in results.

pH-Mapping™

PAMPA EVOLUTION offers the ability to manipulate pH using a powerful pH-Mapping procedure. Ninety-six different buffers can be made from pH 1.5 to pH 10.0. This allows multiple pH measurements to be easily made and consistently reproduced.



Why is PAMPA EXPLORER™ for you?

Despite the fanfare, many companies are still wary of initial costs and the potential for PAMPA in their labs. pION has specifically developed EXPLORER to alleviate these concerns by packaging a straight-forward PAMPA system that is cost-effective and easy to use. By removing the barriers to entry, EXPLORER empowers its users to

obtain maximum results with minimum investment.

Constant Research- PAMPA EXPLORER not only provides you with the ability to assess permeability, it gives you access to the expertise within pION. Our scientists are constantly working to expand the limits of PAMPA experiments.

Experimental Flexibility- pION has demonstrated applications beyond oral absorption modeling. Using our PAMPA, we have developed new techniques for BBB distribution modeling, skin penetration studies, and DMPK profiling.

In addition, once you discover the power of PAMPA, EXPLORER puts you at the ready to upgrade to high-throughput instruments. Since EXPLORER software is descended from our more complex PAMPA EVOLUTION platform, the addition of a robotic system can immediately enable your lab to process thousands of permeability assays every week.

PAMPA EVOLUTION is compatible with several robotics platforms for liquid handling and data collection.

