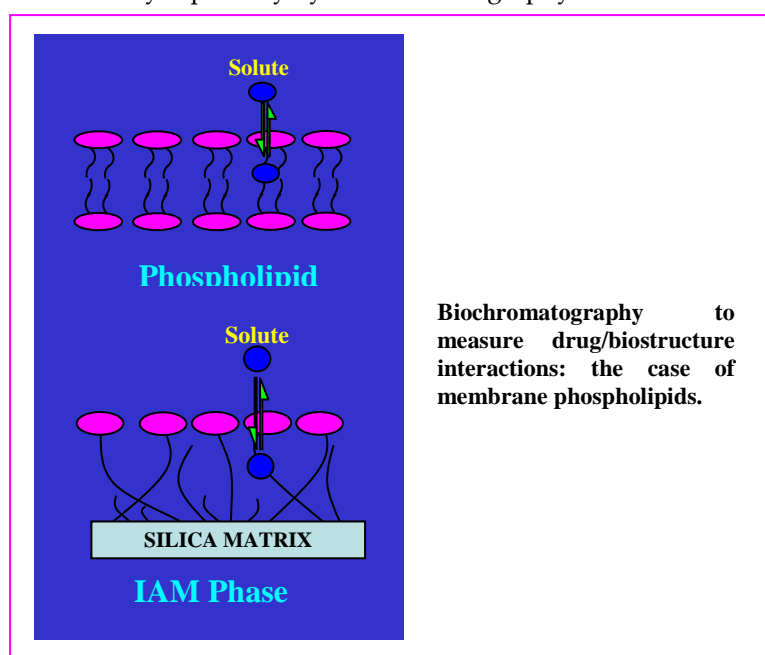


## Assessment of physico-chemical properties of drugs to predict pharmacokinetics

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The knowledge of drug physico-chemical properties (e.g. solubility, dissolution rate, lipophilicity) plays a pivotal role in both the rational development of formulations and prediction of pharmacokinetics. The assessment of drug affinity for both membrane phospholipids and serum-proteins (Human serum Albumin and alpha acid glycoprotein) yields very useful information in these fields. Quantitative and reproducible measures can be gained in a very rapid way by biochromatography.



### 1. Description of the product

Rapid, reproducible, and direct measures of drug affinity for both serum-proteins and membrane phospholipids are achieved by biochromatography. These data, combined to other physico-chemical parameters (e.g. solubility, dissolution rate, lipophilicity) can predict pharmacokinetics in a very effective way. The high potential of phospholipid biochromatography (IAM-HPLC) in predicting drug/membrane affinity can avoid most *in vivo* experiments to evaluate bioavailability. Biochromatography on serum-proteins detects specific binding to enantioselective sites predicting drug-drug interactions *in vivo*.

### 2. Innovative aspect of the product

Drug pharmacokinetics (e.g. absorption and distribution) is related to the capability to cross biomembranes. Partition coefficient between a lipophilic (octanol) and an aqueous phase,  $\log P$ , is regarded as the reference parameter. However, mainly for ionizable compounds (about 65% of marketed drugs), it is often demonstrated ineffective to predict gastro-intestinal absorption, passage through blood-brain barrier, and serum-protein binding. Moreover,  $\log P$  determination is tedious and time-expensive, making the technique poorly suitable in industrial field. HPLC methods allow fast and reproducible lipophilicity determinations; moreover, when performed on phospholipid or serum-protein stationary phases they produce direct measures of the interactions with the bio-phases. On phospholipids the affinity values encode not only partition but also electrostatic interactions drug/membrane. On serum-proteins both drug-drug interactions and binding on

enantioselective sites are detected. Biochromatography is a high-throughput method suitable for industrial scale screenings.

### 3. Main advantages of the offer

The direct measures of the interactions between drugs and biological structures, such as membrane phospholipids and serum-proteins, are much more effective than the “classical” lipophilicity parameters to predict their in vivo behaviour. Consequently, they allow to perform suitable strategies, e.g. in the formulation phase, to optimize bioavailability. Information gained by biochromatography can avoid, or at least reduce, experiments on animals.

### 4. Technology key words

Pharmacokinetics; Bioavailability; Serum-proteins; Biochromatography.

### 5. Current Stage of Development

Available for demonstration – field tested

### 6. Intellectual Property Rights

Partnership/other contractual agreements

## Technical and scientific publications

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