IAM COLUMNS
Immobilized Artificial Membrane Columns

Rapid biomimetic screening of drug-membrane affinity

AN ADVANCED TOOL FOR DRUG DISCOVERY

Accelerate Drug Discovery
Speed Compound Selection
Reduce Attrition at Late Stage
Limit the Number of Animal Studies
IMMUNIZATION WITH ARTIFICIAL MEMBRANE (IAM)

**BENEFITS FOR DRUG DISCOVERY**
- Rapidly screen drug/phospholipid interactions
- Identify suitable compounds early in the process
- Identify and eliminate compounds with low permeability
- Predict *in vivo* compound behavior, reducing need for animal studies

As phospholipids are major components of tissues and cells, drug interaction with phospholipids is an important contributor to distribution. Immobilized Artificial Membrane (IAM) chromatography can be used to quickly measure drug-phospholipid interactions via retention times.

**IAM COLUMN STATIONARY PHASE CHARACTERISTICS AND USES**
- Emulates the lipid environment on a solid surface
- Covalently bonded Phosphatidylcholine (PC) to silica
- Highly stable stationary phase suitable for thousands of injections
- Retention on the IAM stationary phase can be directly related to membrane partition coefficients
- Thousands of drug discovery compounds can be characterized by IAM retention time measurements
- Normalized retention times are used for ranking compounds

**DRUG/PHOSPHOLIPID BINDING CAN INFLUENCE:**
- Permeability
- Absorption
- Solubility enhancement
- Toxicity
- Volume of distribution
- Drug efficiency
- Cellular potency

**Requirements for potential drug molecules**
- Potency
- Selectivity Non-toxic
- Cellular potency
- *in vivo* potency efficacy
- *in vivo* exposure Good PK/PD
- Solubility
- Permeability
- Good absorption
- Low dose
- Good drug efficiency

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Quickly set up IAM screening to get an early indication of drug membrane interaction:

- Inject a calibration mixture and run a simple gradient
- Plot the calibration curve
- Inject your drug compound under the same conditions and obtain K values
- Using supplied equations the drug sample is then compared to known binding models

Detailed procedures are provided in our user guide.

IAM chromatography is a simple and reliable tool to measure phospholipid/drug affinity via calibrated retention times on IAM stationary phases. Regis Technologies IAM Columns are high quality, long lasting HPLC columns providing reliable measurements across a wide range of drug molecules. A calibration mixture and instructions how to obtain and use the critical information of drug discovery compounds are also available.

**VOLUME OF DISTRIBUTION MODEL**

Human clinical steady state volume of distribution (logVdss) data of 130 marketed drug molecules shows trends with the estimated values using IAM and HSA binding data.

**DRUG EFFICIENCY MODEL**

The sum of the IAM and HSA binding of compounds models the in vivo drug efficiency.

**SOLUBILITY ENHANCEMENT BY MICELLES IN SIMULATED INTESTINAL FLUIDS**

The intestines contain phosphatidyl choline micelles that enhance the solubility and absorption of nutrients. Solubility enhancement shows good correlation to IAM binding of compounds.

**PHOSPHOLIPIDOSIS TOXICITY POTENTIAL**

CHI IAM values higher than 50 indicate phospholipidosis potential. Phospholipidosis is an accumulation of lamellar phospholipids in the cell often caused by drugs. Hepatotoxicity caused by phospholipid accumulation detected by Nile Red fluorescence shows excellent correlation to CHI IAM values.
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An advanced tool for drug discovery

Add Regis’ IAM columns to your drug discovery tool box today!

Useful References for Drug Membrane Affinity Screening with IAM
3. Tsopelas et al., The potential of immobilized artificial membrane chromatography to predict human oral absorption, European Journal of Pharmaceutical Sciences 2016, 81, 82-93.