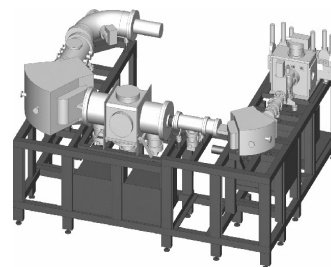


## About Vitalea Science

Vitalea Science is a pioneering Bioanalytical Contract Research Organization, which provides services based on Accelerator Mass Spectrometry technologies for exploring the pharmacokinetics and metabolism of drug candidates directly in humans, as part of Phase 0, Phase I, or later clinical trials.



Vitalea's *service philosophy* is to develop long term relationships with clientele by providing advanced clinical drug development solutions. We uphold this philosophy through a focused emphasis on integrity, teamwork, and exceptional science.

### Core Services

- Ultra-low level  $^{14}\text{C}$  analysis for Microdosing and Microtracing
- Traditional radioanalysis for metabolism investigations, clinical and nonclinical
- Clinical study design
- Human dosimetry
- Data reporting

Vitalea has worked in many indication areas using various routes of deliver with many of the major pharmaceutical companies of the globe. Please ask us about our record of experience.

### Areas of Specific Expertise

- Mass Balance (urine, feces, plasma, whole blood, and expired air)
- Metabolic profiling with UPLC-AMS
- Interspecies Profiling
- Hybridization of traditional radioanalysis with AMS-based analyses
- Next generation of Accelerator Mass Spectrometer: the BioMICADAS<sup>TM</sup>

### Quality System

- GLP compliant system
- Vitalea maintains Standard Operating Procedures (SOPs), including method validation and report generation
- Staff trained in GLP system according to CFR 21Part58
- Independent Quality Unit
- Many sponsor audits completed



## Next Generation Technology

Vitalea Science has collaborated with the Paul Scherrer Institute and the Swiss Federal Institute of Technology to design and implement the BioMICADAS™. This "next generation" AMS technology was specifically designed for clinical studies that must be conducted under good laboratory practices.



BioMICADAS™ features are:

- Compact
- Designed for operator safety
- Highest sample throughput
- Gas and Graphite interface
- Web based monitoring
- Validated hardware and software
- Exclusive to Vitalea Science

Validated performance of the BioMICADAS™

Parameter	<sup>14</sup> C Spectrometer
Specificity	1:10 <sup>14</sup>
Robustness	2.5%
Reproducibility	<1% single sample
Precision	1.5% multiple samples
Stability	<3% over 1 year
LLOQ	0.1 Modern
ULOQ	112 Modern
Accuracy/linearity	0.99±0.01
Throughput	20 per hour
Sample Loading	Continuous feed
System Suitability	Once per week

The validated performance specifications are provided in the above table. The robustness and stability of the spectrometer is evidenced by the requirement for only weekly system suitability tests during GLP operations

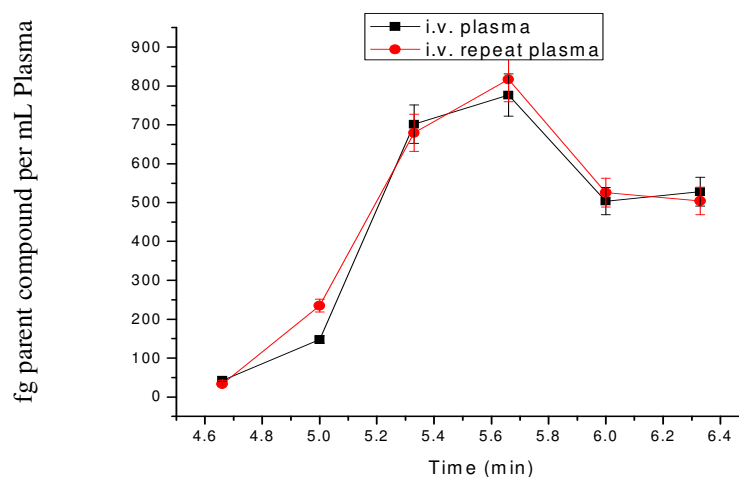
## Emphasis on Chromatography

Vitalea has redundant, validated UPLC Systems™ that can be operated in either the HPLC or UPLC mode for reproducible quantification. Each instrument is equipped with a fraction collector that provides down to 6-second temporal resolution. The proven stability of UPLC instruments enable quantitative inter-species comparisons to be made even when sample injections are made on different dates. The quantitative aspects of <sup>14</sup>C-tracers ensure a full accounting of the recovery of the drug from extraction to off-column collection.



## Accelerating early clinical development with microdosing and microtracers

A test of UPLC-AMS reproducibility shows a metabolite peak in urine samples separated by UPLC and measured by AMS on different days. Error bars represent the AMS counting uncertainty at  $1\sigma$  and should overlap only at 4 of the 6 points. The only non-overlap occurs at the rising edge of the peak.



## Advances in our Proprietary *In Situ* Fullerene Production System

With our years of experience beginning with the pioneering basic research our scientists conducted in the 1990's, Vitalea has optimized the *in situ* fullerene production system for rapid and fast sample processing. This method ensures high throughput sample preparation where cross-contamination is controlled by design and not effort. As a result, Vitalea can successfully measure specimens much higher in  $^{14}\text{C}$  contents than competing laboratories.

**Facility** - Vitalea resides in a 7,200 sq. ft. purposely-designed facility near the UC Davis campus. Key features are

- GLP Quality System with independent QA unit
- Validated Waters Acquity UPLC systems
- Liquid Scintillation Counter with Tissue Oxidizer
- Multiple ULT freezers with secondary NIST-traceable monitoring probes and 24/7 continuous alarmed monitoring and generator back-up.
- Multiple concentration and graphitization stations
- GLP equipment on 6 month calibration service schedule
- Containment room with chemical hood and fecal processing equipment for processing high  $^{14}\text{C}$  ADME specimens
- Proprietary methods and equipment for fullerene production and Total Carbon determinations
- In house excreta-slurry formation for ADME studies
- World's most compact and fully validated AMS system: The BioMICADAS™

