

**DFG Core Facility –
Center of Stable Isotope Research in Ecology and Biogeochemistry (BayCenSI)
User Rules and Regulations *(from 03/15/2024)***

The following user regulations apply to all users of the Center of Stable Isotope Research in Ecology and Biogeochemistry (BayCenSI).

1. Scope of the BayCenSI

The BayCenSI is a central service and teaching facility of the University of Bayreuth (UBT), which provides UBT members and external researchers in the fields of ecology, biogeochemistry, and life sciences with access to high-end instrumentation, high-quality services, technical support, training, and collaboration in the development of innovative methods. The BayCenSI aims to support research and teaching in the priority area 'Ecology & Environmental Sciences' of the UBT while also pursuing its own project-based scientific research. The website of the BayCenSI (www.censi.uni-bayreuth.de) describes the analytical services and teaching offers, presents the existing technical equipment, and lists publications with the participation of BayCenSI.

2. Access modes / Costs

The resources of BayCenSI are available via the following support modes:

- a) Internal users must cover the actual project costs (consumables). The manager compiles the costs incurred at the end of the project and settles them by internal university transfers from the specified account. A price list for UBT members is available on the BayCenSI webpage and accessible with the UBT login.
- b) UBT members and external users may apply for 'Stepping Stone Projects' to carry out small exploratory studies free of charge (covered through DFG funds of the Core facility). This possibility is also available for users from outside of Germany.
- c) External users may access the Core facility based on several categories:
 - a. According to legal regulations, access for external (scientific) partners can be granted upon payment of a fee covering the full costs of the analysis, including personnel and overhead costs. The prices will be calculated individually, based on the actual costs. An estimate will be provided on request.
 - b. Scientists from other Bavarian universities who are not members of the UBT may use the Core Facility upon payment of a fee covering the full costs of the analysis, including personnel and overhead costs but excluding the Value-Added Tax.
 - c. Scientists from Germany can be granted access to the BayCenSI through project cooperation agreements (*i.e.*, where funds for measurements are directly booked into the BayCenSI's accounts at the start of the envisioned project). Thus, allowing the treatment as internal costs

3. Booking and sample submission

For routine measurements (*i.e.*, ^{13}C , ^{15}N , ^2H , and ^{18}O of solid and liquid samples), orders are processed in the order in which they are received (including the sample submission form). The manager and potential users arrange time slots for compound-specific and novel analysis. The steps for sample submissions include the following consecutive steps:

- The potential user contacts the BayCenSI manager via e-mail or by phone.
- Download, fill out, and submit the sample registration form for the Core Facility (download link via website).
- Read and sign the Data Agreement Form (see below)
- Submit your samples, making sure the samples are identified as stated in the sample submission form.

4. Available Equipment

a) Sample preparation:

Preparation laboratories available for the exclusive use of natural abundance stable isotope samples:

- GEO I, room 128, for weighing and room 127 for drying and ball-milling

Preparation laboratories for the preparation of stable isotope abundance analysis of samples artificially enriched in heavy isotopes:

- GEO I, room 227, for drying, milling, and weighing.

In addition, the isotope laboratories (including sample preparation and analytics) at the Departments of Soil Ecology and Ecological Microbiology will be made upon request via the BayCenSI.

b) Analytical instrumentation

The Core Facility is equipped with 5 Isotope Ratio Mass Spectrometers (IRMS) with several different peripherals directly belonging to the BayCenSI. In addition, two additional instruments are available through the BayCenSI (LA-IRMS and OA-ICOS), accessible for users through the facility and situated at the Department of Soil Ecology and Agroecology, respectively. The investigated analyses include the stable isotopes C, N, H, and O in different matrices.

Special care is taken to avoid any contamination of natural abundance samples with enriched and labeled material. Therefore, separate sample preparation rooms are available and can be booked internally. The use and possible contamination of samples with labels must be indicated in the sample submission form and communicated. Failing to do so, may indicate, depending on the severity of the damage caused, a fee of up to EUR 5000. Details on the available equipment are given in the table below.

5. Publication of data

Access to the facility will only be granted with the understanding that all data resulting from work at the BayCenSI have to be published in peer-reviewed international journals, preferably open access. Users are responsible for the publication of their data. However, the BayCenSI likes to encourage users to make their data publicly available on a long-term basis in generic or discipline-specific data repositories. A (persistent) identifier should be assigned (such as a DOI) to the research datasets to ensure identification, citation and discoverability of the datasets.

The analytical service provided by the BayCenSI is to be indicated in scientific (data) publications at the appropriate position. Any work that originated in the BayCenSI must be clearly identified and cited in the acknowledgements of the publication.

If the development of new analytical methods or significant, intellectual contributions by service facility members become necessary for the design of experiments or the generation and/or evaluation of the data, the users commit themselves to include these members in the respective publication as co-authors according to good scientific practice.

Instruments available to the Core Facility (BayCenSI) for high-precision analysis of stable isotope abundances of the elements carbon (C), nitrogen (N), hydrogen (H), and oxygen (O) and the corresponding peripheral devices.

#	Instrument	Periphery	Specifications	Manufacturer	Department	Analytical services	Sample material
1	IRMS with interface "Martin"	Pyrolysis oven with equilibration autosampler	DELTA V ConFlo IV HTO	THERMO Scientific THERMO Scientific HEKAtech	BayCenSI	¹⁸ O and ² H analysis of organic solids and liquids and of water.	Liquids, soils, sediments, plant, and animal tissues.
		Elemental analyzer with minimum blank autosampler	UniPrep II Flash EA (micro-adapted)	Eurovector THERMO Scientific		¹³ C and ¹⁵ N analysis of organic solids on micro sample level	Soils, sediments, plant, and animal tissue from rare specimens with limited, unknown, and micro sample amounts
2	IRMS with interface "James"	Flow-injection chromatography with cryo-trapping and headspace handling autosampler	DELTA V ConFlo IV Gasbench II (modified) 2 PreCon (modified)	THERMO Scientific THERMO Scientific THERMO Scientific THERMO Scientific	BayCenSI	¹⁸ O analysis of headspace samples and trace gases, especially Dissolved oxygen, ¹³ C analysis of CH ₄ Isotopomers of N ₂ O	Dissolved gases and gas mixtures; trace gases.
3	IRMS with interface "Luci"	High-throughput EA	DELTA V Plus EA/NA 1108 GC Pal TraceGC	Thermo Scientific Thermo Scientific Thermo Scientific Thermo Scientific	BayCenSI	¹³ C and ¹⁵ N analysis of organic solids from natural abundance and highly enriched samples	Soils, sediments, plant, and animal tissue
		GC with combustion and pyrolysis unit	IsoLink II Triplus RHS	Thermo Scientific Thermo Scientific Thermo Scientific		Compound specific analysis ¹³ C, ¹⁵ N, and ² H	Extracted and derivatized fatty acids (FAME) and other compounds
4	IRMS with interface	Ablation laser with combustion unit	DELTA V ConFlo IV PreCon (modified) CETAC LSX-213	Thermo Scientific Thermo Scientific Thermo Scientific Teledyne	Soil Ecology ^b accessible through BayCenSI	Spatially resolved ¹³ C analysis; resolution 10-100 μm	soils, sediments, plant, and animal tissues
5 ^a	OA-ICOS	Multiport and discrete injection unit	CCIA-38d-EP	Los Gatos Research (ABB) HEKAtech	Agroecology ^b accessible through BayCenSI	Continuous and programmed discrete measurement of ¹³ C and ¹⁸ O in CO ₂ samples of (several) measurement chambers	In situ and discrete gas mixtures

#	Instrument	Periphery	Specifications	Manufacturer	Department	Analytical services	Sample material
6	IRMS with interface "Margret"	EA, GC, C	DELTA plus ConFlo III NC 2500, Trace GC, Combustion Interface III	Thermo Scientific Thermo Scientific CE Instr. Thermo Scientific Thermo Scientific	BayCenSI	¹³ C and ¹⁵ N analysis of solids with ¹³ C/ ¹⁵ N-enrichment of < 1000‰; ¹³ C CO ₂ gas with ¹³ C/ ¹⁵ N-enrichment of < 1000 ‰; compound specific ¹³ C and nitrogen ¹⁵ N analysis of CH ₄ and N ₂ O	soils, sediments, plant and animal tissues; gas mixtures, trace gases
7	IRMS with interface "Michelle"		IsoPrime EuroEA 3000	Micromass EuroVector	BayCenSI	¹³ C and ¹⁵ N analysis of solids with ¹³ C/ ¹⁵ N-enrichment of < 1000‰	soils, sediments, plant, and animal tissues
8	IRMS with interface "David"	and autosampler, GC-C	MAT 253 GC Combustion III GC Pal Trace GC ultra	Thermo Scientific Thermo Scientific CTC Analytics Thermo Scientific	BayCenSI	¹³ C in CO ₂ and CH ₄ gas with ¹³ C-enrichment up to 100 at‰; compound ¹³ C isotope analysis	gas mixture
9	Growth chamber equipped with supplies for ¹³ C-CO ₂ pulse / continuous labeling		Growth chamber LKK1	Thermo TEC	Agroecology ^b accessible via BayCenSI	Setup for ¹³ C-CO ₂ labeling experiments	gas: coupled with #5 OA-ICOS for continuous CO ₂ analysis

IRMS: Isotope Ratio Mass Spectrometer; EA: Elemental Analyzer; PreCon: Cryo-trapping and combustion device for trace gases; GC: Gas Chromatograph; HTC: High Thermal Conversion Interface; OA-ICOS: Off-Axis Integrated Cavity Output Spectroscopy; ^aThe instrument is also used for analysis of stable isotope tracers. ^bThese devices belong to the respective research groups, shared use is possible via the CF; Analyses, quality assurance and scientific advice is covered by UBT / researchers employed within the respective groups. Most of the instruments run continuously (24h on 7days), with the exception of downtimes for maintenance work.

5. Organization

The BayCenSI is under the management of the Bayreuth Center for Ecology and Environmental Sciences (BayCEER), represented by the BayCenSI director and the manager. The steering committee defines and pursues the strategic orientation of the Core Facility.

Members of the steering committee are:

Prof. Dr. Johanna Pausch, Agroecology, Director of the BayCenSI:

Johanna.Pausch@uni-bayreuth.de

Dr. Alexander H. Frank, BayCenSI, Manager of the BayCenSI:

Alexander.Frank@uni-bayreuth.de

Advisory members of the BayCenSI:

Prof. Dr. Eva Lehndorff, Soil Ecology,

Eva.Lehndorff@uni-bayreuth.de

Prof. Dr. Tillmann Lüders, Ecological Microbiology,

Tillmann.Lueders@uni-bayreuth.de

Prof. Dr. Gerhard Gebauer, former head of the BayCEER Isotope-Facility,

Gerhard.Gebauer@uni-bayreuth.de

Dr. Birgit Thies, BayCEER Coordination,

Birgit.Thies@uni-bayreuth.de

For inquiries concerning sample handling and submission, please use one of these points of contact:

a) write to censi@uni-bayreuth.de

b) or fill in the contact information on <https://www.censi.uni-bayreuth.de/en/Contact/index.php>

c) reach out to one of the technical assistants:

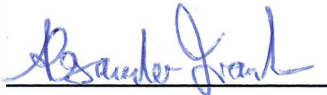
Bauer, Carina, Carina.Bauer@uni-bayreuth.de, Tel: (+49) 921- 55 2322

Eckert, Petra, Petra.Eckert@uni-bayreuth.de, Tel: (+49) 921 – 55 2324

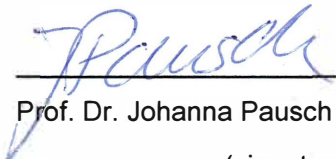
Rooms

6. Data management and data agreement with users (see next page)

Bayreuth, 19.5.24



Dr. Alexander Frank



Prof. Dr. Johanna Pausch

(signature)