

Investitionsantrag Projektwettbewerb SVB 2019

Das Institut für Biochemie an der Fakultät für Chemie und Pharmazie der Albert-Ludwigs-Universität Freiburg beantragt über das Studierendenvorschlagsbudget 2019 (SVB 2019) des StuRas die Finanzierung einer Stopped-Flow-Apparatur für eine neuartige Erweiterung des Lehrangebots und die Verbesserung der Qualität der interdisziplinären Lehre in den Studiengängen M.Sc. Chemie, M.Sc. Biochemistry and Biophysics und M.Sc. Sustainable Materials.

Projektvorstellung

Gegenstand des Antrags ist eine Stopped-Flow Anlage zur Messung des sehr schnellen Zeitverlaufs chemischer und enzymatischer Reaktionen. Im Unterschied zu den konventionellen, bislang in der Lehre gebräuchlichen Anlagen werden beim Stopped-Flow Verfahren Flüssigkeiten unter Hochdruck innerhalb weniger Millisekunden gemischt und der Fortgang der Reaktion, d.h. der Umsatz der Stoffe miteinander mit einem optischen Detektor nachgewiesen. Die Zeit, die zwischen Mischung und Messung verstreicht, kann variiert werden, was die Beobachtung des Reaktionsverlaufs zu verschiedenen Zeitpunkten erlaubt. Dies ist die einzige Methode, die es ermöglicht, sich schnell einstellende, vorgelagerte Zwischenstufen der Reaktion nachzuweisen. Dieses Wissen ist essentiell für das Verständnis der Reaktion und zu deren Manipulation, was zu der Herstellung neuer Stoffe führen kann. Die Anregung zur Antragstellung kam von Studierenden des M.Sc. Biochemistry and Biophysics, die im Rahmen des Praktikums „Advanced Protein Biochemistry“ bemängelten, dass ein solcher Versuch nicht zur Verfügung steht. Die Beschaffung eines Geräts dieser Preiskategorie ist aus Mitteln des Institutes allerdings nicht zu stemmen. Der Aufbau der geplanten Versuchsserie mit der Anlage wurde entsprechend in Zusammenarbeit mit den Studierenden erstellt. Die Versuchsserie soll nach Etablierung als regelmäßige Veranstaltung jedes Semester angeboten werden.

Die hier beantragte Stopped-Flow Anlage besteht aus zwei Komponenten: der schnellen Mischeinheit SFM-2000/S und dem schnellen optischen Detektor Typs MOS-200. Das SFM-2000/S enthält zwei Spritzen mit eigenen Schrittmotoren sowie einen Kugelmischer und ermöglicht die automatisierte Mischung von bis zu zwei Flüssigkeiten bei einer minimalen Totzeit von 0,7 Millisekunden. Das Gerät erreicht damit eine ausgezeichnete zeitliche Auflösung chemischer und enzymatischer Reaktionen im Submillisekunden- bis Sekundenbereich.

Die Anlage soll in den Praktika der M.Sc. Studiengänge Chemie, Biochemistry and Biophysics und Sustainable Materials eingesetzt werden. Diese interdisziplinären Studiengänge werden von den Fakultäten Chemie und Pharmazie, Biologie und der Technischen

Albert-Ludwigs-Universität
Freiburg

Institut für Biochemie
Dr. Stefan Gerhardt

Albertstraße 21
D- 79104 Freiburg

Tel. +49 (761) 203-5970
Fax +49 (761) 203-6161

gerhardt@bio.chemie.uni-freiburg.de

www.xray.uni-freiburg.de

Freiburg, 08.06.2018

Fakultät getragen. Die Stopped-Flow Analyse wird in der Ausbildung der Studierenden dieser Studiengänge benötigt und steht zurzeit nicht zur Verfügung. Es soll eine experimentelle Versuchsserie an der Schnittstelle in der Ausbildung der Studierenden der Biologie, Chemie, Mikrosystemtechnik, Pharmazie und Physik etabliert werden, die eine hochaktuelle Technik vermittelt, um die Ausbildung auf den modernsten Standard zu bringen. Als Besonderheit sollten Reaktion unter Ausschluss von Sauerstoff beobachtet werden. Dies ist besonders wichtig für Elektronenübertragungs-Reaktionen, die zum Beispiel bei neuartigen, nachhaltigen Brennstoffzellen eine wichtige Rolle spielen. Das für das Arbeiten unter Sauerstoffausschluss benötigte „Anaerobenzelt“ mit Sicherheitsschleuse wird von dem Institut für Biochemie zur Verfügung gestellt (ca. 25.000 €). Mithilfe dieses Aufbaus lernen die Studierenden u.a. die Reaktion Sauerstoff-empfindliche Enzyme zu beschreiben und werden befähigt, daraus den richtigen Mechanismus des Stoffumsatzes zu erkennen. Experimente dieser Art können in der Ausbildung bislang nicht durchgeführt werden. Die Versuchsserie wird in die Praktika „Advanced Protein Biochemistry“ (M.Sc. Biochemistry and Biophysics), im „Biochemischem Praktikum“ (M.Sc. Chemie) und in dem Modul „Methoden und Konzepte“ dieser Studiengänge und dem des M.Sc. Sustainable Materials, Biologie und Physik eingebettet werden. Das Institut für Biochemie verpflichtet sich weiterhin, neue Seminare zu etablieren, in denen der Aufbau erklärt und ein Verständnis der mit der Methodik erhalten Ergebnisse vermittelt wird. Die Teilnehmer_innen des Seminars werden in der Lage sein, anhand experimenteller Ergebnisse Mechanismen chemischer Reaktionen zu verstehen und zu erklären. Somit wird den Studierenden ein tiefes Verständnis chemischer und enzymatischer Reaktionen mit Hilfe von „State-of-the-art“ Geräten vermittelt. Eine Nutzung der Anlage durch andere Institute auch aus anderen Fakultäten wird ermöglicht werden.

Kurzzusammenfassung des Projekts

Das Institut für Biochemie beantragt die Anschaffung einer Stopped-Flow Anlage zur Analyse sehr schneller chemischer und enzymatischer Reaktionen unter Ausschluss von Sauerstoff. Damit wird eine Versuchsserie etabliert, die Studierenden der Studiengänge Chemie, Biochemie und Biophysik und Sustainable Materials angeboten wird. Diese interdisziplinäre Schnittstellen-Technik kommt den Studierenden der Biologie, Chemie, Mikrosystemtechnik, Pharmazie und Physik zu Gute. Eine vergleichbare Anlage ist für Ausbildungszwecke an der Universität Freiburg nicht vorhanden.

Kostenaufstellung

Nachfolgend sind alle Kosten inklusive Schulung und Versand aufgeführt. Die Mehrwertsteuer in Höhe von 20 % ist der in Frankreich fällige Steuersatz.

Position	Artikelnr.	Artikelbezeichnung	Stückzahl	Preis
1	054-12/21	SFM-2000/S stopped flow mixer	1	22.062,00 €
2	058-07/3	MPS-70 (3 motors)	1	0,00 €
3	054-15/7.5	Observation cuvette FC-15/7.5	1	0,00 €
4	049-05	MOS-200, Rapid kinetics optical system	1	24.284,00 €
5	999-260/1	Installation and user training in Europe – one day	1	2.520,00 €
6		Versand	1	250,00 €
1-6		Summe netto		49.116,00 €
		MwSt. 20 % (Frankreich)		9.823,20 €
		Summe brutto		58.939,20 €

Das entsprechende Angebot der Fa. BIO-LOGIC SAS mit der Nummer 24430 liegt dem Antrag als Anhang bei.

Erklärung über beantragte Fördergelder oder Förderungen durch andere Stellen

Für das hier vorgestellte Projekt sind an keiner anderen Stelle Fördergelder beantragt worden. Eine Förderung durch andere, externe Stellen besteht nicht. Das Institut für Biochemie wird sich Falle der Bewilligung an der vollständigen Ausrüstung der Anlage durch Bereitstellung eines Anaerobenzeltes mit Sicherheitsschleuse im Wert von etwa 25.000 € beteiligen. Weiterhin wird das Institut für Biochemie Lehrpersonal zur Verfügung stellen, das die Anlage aufbaut, wartet, den Studierenden bei den Experimenten zur Seite steht und die Theorie zu den Versuchen in Seminaren erklärt.

Kennzeichnung

Der Antrag soll als Innovation gewertet werden.

Mit freundlichen Grüßen

Dr. Stefan Gerhardt

– Praktikumsleitung Biochemie –

BIO-LOGIC SAS

 4, rue de Vaucanson
 38170 SEYSSINET-PARISSET - FRANCE

 Tel. : +33 476 98 68 31
 Fax : +33 476 98 69 09
 Email : jean-sebastien.bonin@bio-logic.net
 Web : www.bio-logic.net

Albert-Ludwig-Universität

 GERHARDT STEFAN
 Institut für Biochemie
 Raum 10024
 Albertstrasse 21
 79104 Freiburg
 Allemagne

REF : JSB QUOTATION email request 08/06/2018

Seyssinet June 08, 2018

DEV : 24430

QUOTATION

EUR

Part number	Description	Qty	Price	Extended price
054-12/21	SFM-2000/S stopped-flow mixer For single mixing steps, with separate stepping motor drives, observation cuvette, Ball Mixer and electro-valve hardstop mechanism. Main Specifications: - exact control of injected volume and flow rate - minimum volume: 25 µl/syr./shot (standard) - priming volume: 88 µl/syringe - mixing ratio: continuously variable from 1:1 to 1:100 - minimal dead time: 0.7 ms (with FC-08) (200 µs with microcuvette accessory) - Ball Mixer Technology for efficient mixing in the most stringent conditions - stopping mechanism with electro-valve, prevents over-pressure artefacts - upgradable to SFM-3000 and SFM-4000 - complete driving software BioKine32 running under Win XP, 7 & 8	1,00	22 062,00	22 062,00
049-05	MOS-200, Rapid kinetics optical system For single-wavelength kinetics with manual single-grating monochromator, photomultiplier tube, amplifier, and complete detection device. Main Specifications: - optical modes: absorbance, total fluorescence, light scattering - acquisition modes: rapid kinetics recordings - fibre optical guide in excitation, PM tube directly at observation head - wavelength range: 200 to 800 nm - slit width: 8 nm - acquisition speed: from 10 µs/point to 10 s/point - multiple times scale data acquisition (logarithmic sampling via software) - filtering: Manual analogue low-pass (10 µs to 30 ms), digital oversampling - noise level in absorbance: 5•10 ⁻⁵ AU (rms at 1 ms integration time constant) - data resolution: 16-bit - complete driving software BioKine32 running under Win XP - can be motorised for automatic scanning capabilities - can be upgraded to anisotropy of fluorescence in T-format	1,00	24 284,00	24 284,00

999-260/1	Installation and user training in Europe - one day including flight fees and accommodation	1,00	2 520,00	2 520,00
-----------	---	------	----------	----------

TOTAL Exwork	48 866,00	
Pack./Ship./Ins.	250,00	
Incoterm	DAP	FREIBURG
TOTAL	49 116,00	EUR

Validity : December 31, 2018
 Indicative delivery time : 6-8 Weeks
 Warranty : 1 Year
 Payment : 30 days from date of invoice by Swift
 Bank transfer

BANK INFORMATION :
 BNP PARISBAS
 BNPPARB ARC ALPIN ENTREP

IBAN : FR7630004024750001035205808
 BIC : BNPAFRPPAAE

Jean-Sébastien BONIN
 Sales and Support Engineer - Rapid Kinetics and Spectroscopy Instruments



TERMS AND CONDITIONS

1. Application of these terms and conditions

The conclusion of this contract implies the acceptance of the present conditions contained herein except for specific conditions written in the offer. These conditions shall prevail over any purchase conditions.

2. Validity of the contract

The validity of Bio-Logic's offer is three (3) months from the date of its issuing unless stated otherwise in the specific conditions written in the offer.

The minimum amount of any order is 150 € excluding duties, tax and shipping charges.

No order issued by the Buyer shall be binding for Bio-Logic unless in writing on Buyer's purchase order form and after Bio-Logic's written acceptance or performance.

To be binding any variation between the order and the offer must be formally accepted in writing by Bio-Logic.

3. Effective Date

The Contract shall come into force on the day of its signature by both Parties or at any time before by mutual written agreement of the Parties.

4. Contractual documents - Order of precedence

The Contract shall be governed by the following documents:

1. Bio-Logic's offer including these Terms and Conditions
2. The Buyer's order
3. The General Purchasing Terms and Conditions of the Buyer

In event of conflicts or discrepancies within or between those documents, precedence shall be given to the documents in the numerical order specified above.

If Bio-Logic and the Buyer have entered into a distribution agreement, governing the terms on which the Buyer will distribute Products of Bio-Logic, the provisions of the Distribution Agreement will prevail over these conditions to the extent of any inconsistency.

5. Prices of the Products

Prices are quoted and payments shall be made in Euros unless stated otherwise in the specific conditions.

Prices are exclusive of VAT or any applicable sales, excise, import or Custom duties. Prices shall include where applicable freight charges and insurance charges.

Prices are exclusive of any packaging imposed by the Buyer.

Bio-Logic shall have the right to increase its prices for Services or Products in proportion with insurance according to the final destination of the Products.

6. Terms of payment

All payments shall be made in accordance with the payment terms mentioned in the contract.

Payment of the Price for the Products shall be made by the Buyer upon order by Swift bank transfer or by irrevocable and confirmed documentary credit payable at sight in France.

Bio-Logic may decide to grant to the Buyer a time for payment of thirty (30) days from invoice date if Bio-Logic considers that the Buyer produces sufficient guarantees.

Partial deliveries can lead to the corresponding invoice.

Any invoiced amount which is not paid when due shall bear an interest equal to the interest rate applied by the European Central Bank to its most recent main refinancing operation plus ten percentage points.

Bio-Logic reserves the right to exercise any of its lawful remedies if the Buyer does not make payments when due. The Buyer shall promptly reimburse Bio-Logic for all costs and expenses, including attorneys' fees incurred by Bio-Logic in collecting sums due it hereunder.

Should the Buyer delay payment, Bio-Logic may change the terms of payment for future deliveries.

7. Delivery - Transport

All delivery dates are estimates only and the time of delivery shall not be of the essence of the Contract.

In no circumstances shall Bio-Logic be liable to compensate the Buyer in damages or otherwise for late delivery or non-delivery of the Products or any of them or for any loss consequential or otherwise arising there from.

The Products shall be delivered Ex-Works Claix (France) according to the Incoterms 2010 (ICC Publication No.15EF), unless otherwise expressly agreed upon between Bio-Logic and Buyer.

The time for delivery proposed or accepted by Bio-Logic is counted from the reception by Bio-Logic of the acceptance by the Buyer of the conditions of the order.

In the case of a documentary credit, the time for delivery is counted from the notification to Bio-Logic by the advising bank of a valid and correctly established documentary credit.

From delivery, as defined above, the Buyer shall bear all the costs and risks of transportation of the Products.

Any claim on the delivered Products must be made in writing within one (1) week from delivery.

Partial deliveries are allowed.

8. Acceptance of the Products

Specific conditions may provide for an acceptance procedure.

9. Transfer of title

Notwithstanding the delivery, the property of the Products shall not be transferred to the Buyer until full payment of their price. Bio-Logic may claim title to the Products for which a single term of payment has not been paid by the Buyer. From the delivery the Buyer bears all the costs and risks relating to the Products.

10. Software

Some Products are sold with an associated software which is the property of Bio-Logic and is protected by law.

The Buyer has the right to use the software in accordance with the instruction manual and user guide provided by Bio-Logic with the Products. The Software is either delivered as a cd-rom with the Product or downloadable from Bio-Logic website (<http://www.bio-logic.info>). For registered users upgrades can be downloaded from Bio-Logic web site (<http://www.bio-logic.info/>).

The Buyer commits:

- to protect the software of any disclosure or any use which would breach a relating license or the present terms and conditions of sale;
- to destroy or to restore to Bio-Logic replaced software, according to Bio-Logic's instructions;
- not to reproduce the software, nor to copy, to translate, to adapt, to change or to modify all or any part of the software.

Source codes shall not be handed to the Buyer.

11. Force majeure

Bio-Logic shall not be liable, directly or indirectly, for any delay or failure in performance of any obligation under the Contract, including any delivery obligation, where such delay or failure arises or results from a cause beyond Bio-Logic's reasonable control, or beyond the reasonable control of Bio-Logic's suppliers or contractors, including, but not limited to strike, boycott or other labor disputes, embargo, governmental regulation, inability or delay in obtaining materials, acts of God, war, earthquake, fire, or flood.

Should a cause of force majeure continue for more than three months, either party shall have the right to terminate the Contract.

12. Warranty and limitation on warranty

Bio-Logic warrants that the Products conform to Bio-Logic 's specifications and shall be free from any defect in material and workmanship for a period of 12 months from their delivery provided that the Product has been operated at all times in accordance with the instruction manual and user guide.

Bio-Logic's obligation under this warranty shall be limited to repair or exchange (at Bio-Logic's option) of the Products or parts thereof which are shown to Bio-Logic's reasonable satisfaction to have proved defective under the conditions of this article.

The warranty does not apply :

- to the accessories and consumables sold by Bio-Logic ;
- to repairs and replacements resulting from normal wear of the Products, lack of care, improper use of the Products, materials supplied or design requested by the Buyer or the customer.
- if Bio-Logic determines that a problem is caused during or as a result of shipment or relocation;
- if Bio-Logic's serial number has been removed or defaced from the Product;
- if a problem arises from or is based on Bio-Logic's compliance with Buyer's specifications.
- if the Buyer has opened or dismantled the Product.

Bio-Logic makes no other warranty, express or implied, to the Buyer, and the Buyer shall make no warranty with respect to the Products on behalf of Bio-Logic.

WARRANTIES HEREIN SET FORTH SHALL BE IN LIEU OF ALL OTHER WARRANTIES AND CONDITIONS EXPRESSED OR IMPLIED, STATUTORY OR OTHERWISE, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Bio-Logic shall not be liable for damages resulting from the lack of advice or warning or from improper or wrong advice or warning given by the Buyer to its customers (for instance operation instructions not given to the customer), or from modifications brought to the Products without Bio-Logic's agreement.

13. Return policy

Product shall be returned to its original packing and must be clean, i.e. exempt from any chemical or radioactive product.

13.1 Product under warranty

No Product shall be returned to Bio-Logic by the Buyer without the prior written authorization of Bio-Logic called Return Material Authorization (RMA). When Bio-Logic has authorized a Product to be returned under warranty, the buyer shall send it freight prepaid to Bio-Logic. Return freight shall be paid by Bio-Logic.

Bio-Logic warrants the repair done on the returned Product during three months. This is not an extension of the warranty specified in article 12.

13.2 After warranty

No product shall be returned before the sending by Bio-Logic of a quotation and its written acceptance by the Buyer.

Return freights (round trip) shall be paid by the Buyer.

14. Termination

In the event the Buyer fails to make payment on an installment, Bio-Logic shall within fifteen (15) days of such failure give written notice by registered mail concerning the delinquency. The Buyer must make full payment within fifteen (15) days after receipt of such notice, failure of which will result in termination of the contract.

Upon such termination, Bio-Logic shall have the right to require from the Buyer that he immediately returns the Products. The Buyer shall hold Bio-Logic free and harmless there from.

15. Intellectual property rights

Bio-Logic shall retain ownership of its studies, models, patterns, drawings and other documents. The Buyer shall not modify, copy or communicate to any third party the transmitted materials nor use them for another purpose than the use of the Products.

The Buyer shall respect the third party 's intellectual property rights.

16. Channels of communication

Any communication, notification or request shall be deemed to have been duly transmitted if delivered by courier, first class mail, e-mail or facsimile by either party to the other at the appropriate address or facsimile number as the parties shall have indicated to each other in writing.

In the event of a requirement for the electronic transmission of data and drawings between Bio-Logic and the Buyer, the Buyer shall make use of a system compatible with that in use at Bio-Logic.

17. Liability

In no event shall Bio-Logic be liable to the Buyer for consequential, indirect or incidental damages (such as non-resulting damage). Bio-Logic specifically disclaims any liability arising from representations or warranties made by the Buyer to any customer.

Bio-Logic also disclaims any liability for damages resulting of use of Products by a person who has not attended Bio-Logic training when such training is required to use the Products.

18. Subcontracting

Bio-Logic is allowed to sub-contract part of the contract to sub-contractors.

19. Governing law

This Contract are governed by French law.

20. Disputes

Should a dispute arise out of the Contract and could it not be settled amicably the commercial court of Grenoble (France) shall be competent. Notwithstanding this stipulation of a jurisdiction, Bio-Logic shall be allowed to lay the case in front of the Buyer's court when Bio-Logic is the plaintiff.