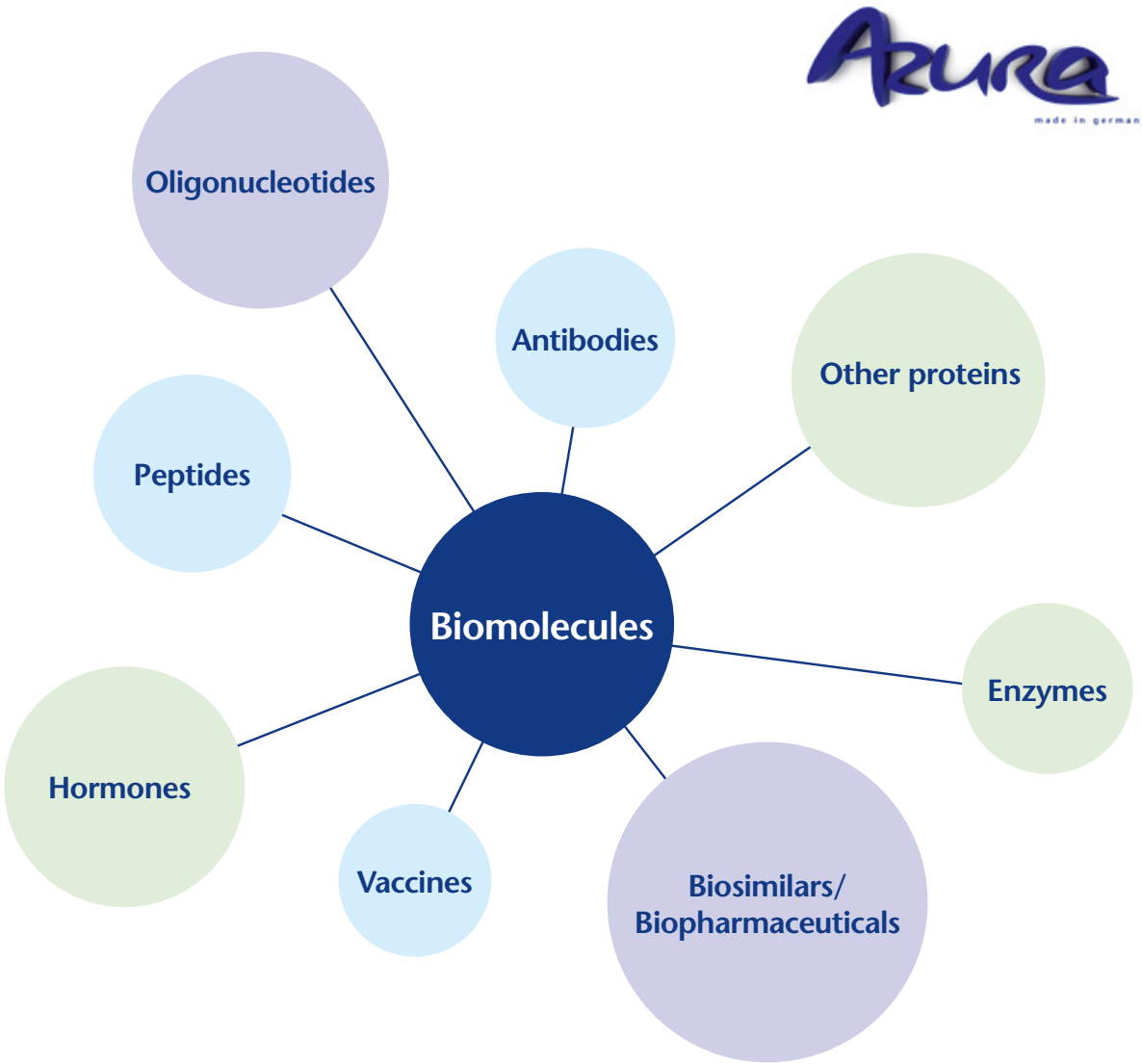
KNAUER

AZURA Bio LC

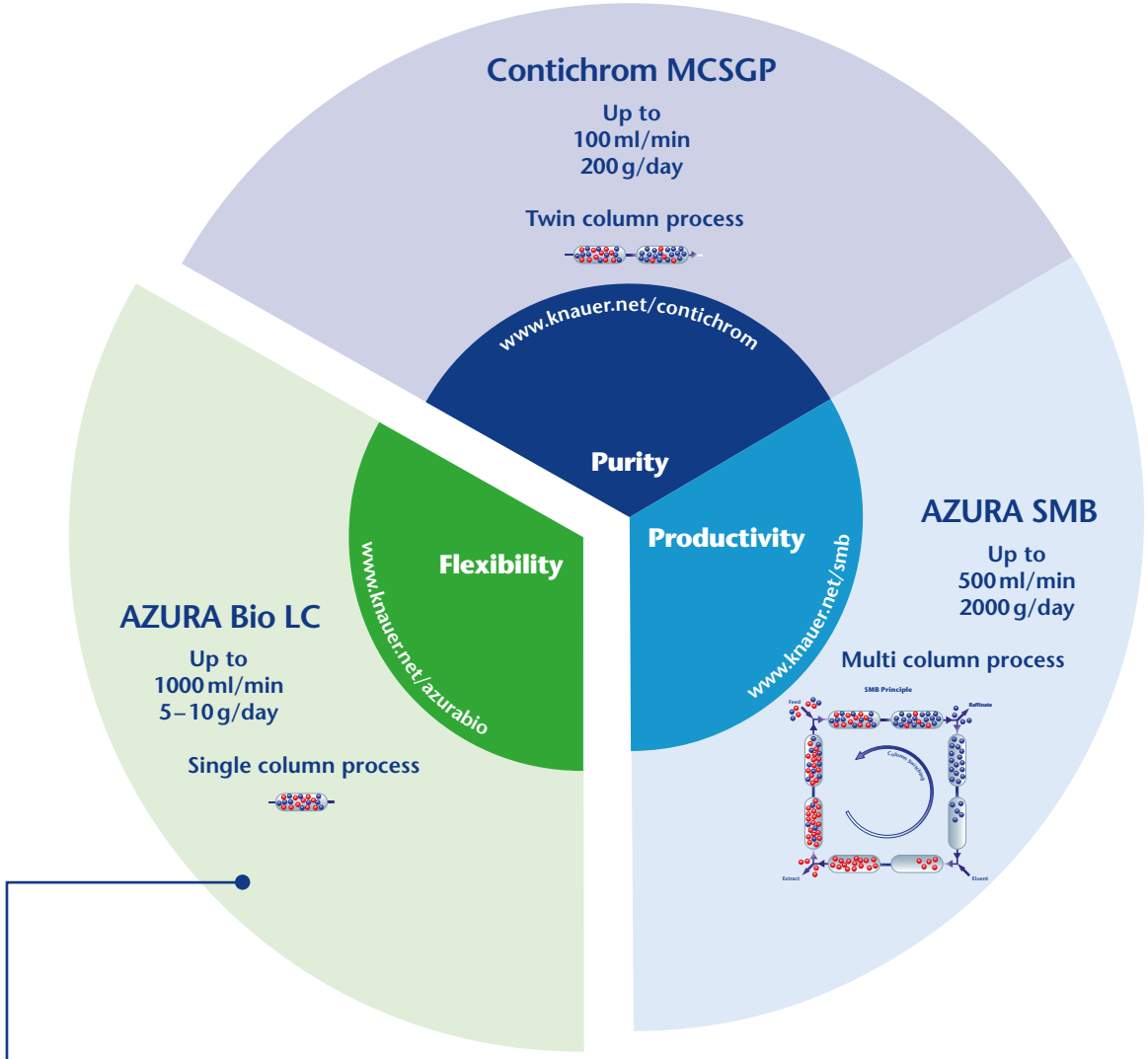
▶ FPLC and Purification Solutions

Flexible and adjustable to your biopurification tasks

Fast protein liquid chromatography (FPLC) of biomolecules can be a task. KNAUER offers with AZURA® an elaborate biochromatography concept, which builds on our experience and is very adaptable. AZURA Bio LC is designed for performance, flexibility and user friendliness. System solutions range from flow rates as low as 0.02 ml/min up to 1000 ml/min by choosing the appropriate pump from KNAUER. A wide range of flow cells for different detectors allows optimized detection. The unique benchtop cooling feature makes costly cooling compartments unnecessary and enables operation in any lab environment. KNAUER supports you in system configuration and application development.



How much product do you want to purify?

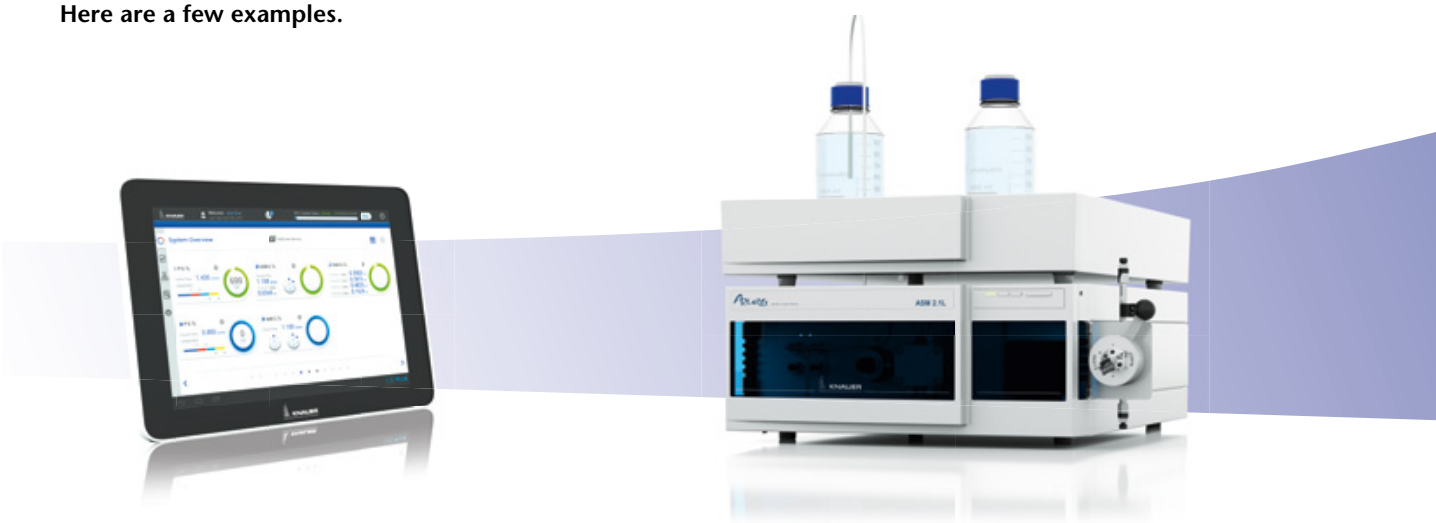


AZURA® Bio LC features

- Isocratic, binary high pressure or quaternary low pressure gradient pumps
- Pump heads allowing flow rates of up to 10, 50, 100, 250, 500 or 1000 ml/min
- Bio-inert wetted materials
- Optional benchtop cooling of glass column and fraction collector
- Choice of different control software packages: volume-based or time-based
- A variety of detectors (UV/VIS, DAD, RI) and monitors (conductivity and pH)
- Wide range of flow cells available, including remote cells with fiber optics
- Integrated leak management and sensors as well as software, monitoring the solvent supply and waste, provide for safety

AZURA Bio LC Purification Solutions

**Designing tailor-made FPLC purification solutions is very easy with the modular AZURA Bio LC platform.
Scalable regarding the purified amount and automatable ranging from basic to sophisticated, you have the choice.
Here are a few examples.**



AZURA Compact Bio LC

**Flow rate: Max. 10 ml/min or 50 ml/min
1/16“**

AZURA System features and options	Available max. flow rates ml/min 10	50	100	250	500	1000	Low pressure gradient option	High pressure gradient option	Manual sample injection	Automated sample injection module	Auto-sampler with cooling option	
AZURA Compact Bio LC	✓	✓							✓	✓		
AZURA Lab Bio LC LPG	✓						✓		✓	✓	✓	
AZURA Lab Bio LC HPG	✓	✓						✓	✓	✓	✓	
AZURA Pilot Bio LC			✓	✓	✓	✓	✓	✓	✓	✓		

Maximum Flowrate

AZURA Lab Bio LC

Flow rate: Max. 10 ml/min or 50 ml/min
1/16“

AZURA Pilot Bio LC

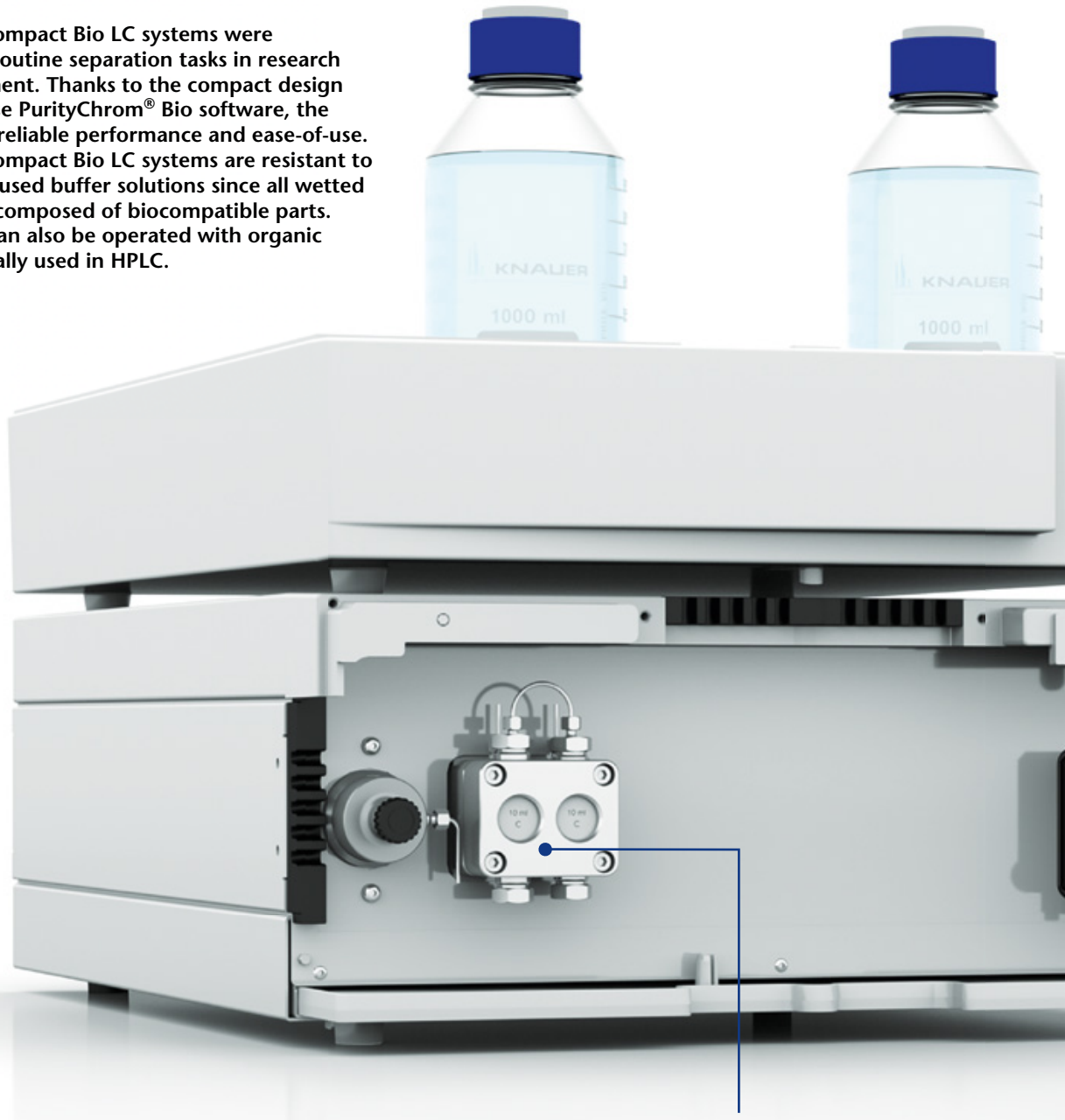
Flow rate: Max. 100, 250, 500, or 1000 ml/min
1/8“ or 1/4“

	Automated buffer selection module	Column switching module	Peak parking module	Air sensor option	Variable single wavelength detection	Variable multiple wavelength detection option	DAD detection option	Conductivity and pH option	Automated fraction collection option
	✓	✓	✓	✓	✓			✓	✓
	✓	✓	✓	✓	✓	✓	✓	✓	✓
	✓	✓	✓	✓	✓	✓	✓	✓	✓
	✓	✓		✓	✓	✓	✓	✓	✓

www.knauer.net/azurabio

What is your idea of straightforward FPLC?

The AZURA Compact Bio LC systems were designed for routine separation tasks in research and development. Thanks to the compact design and easy to use PurityChrom® Bio software, the systems offer reliable performance and ease-of-use. The AZURA Compact Bio LC systems are resistant to all commonly used buffer solutions since all wetted materials are composed of biocompatible parts. The systems can also be operated with organic solvents typically used in HPLC.

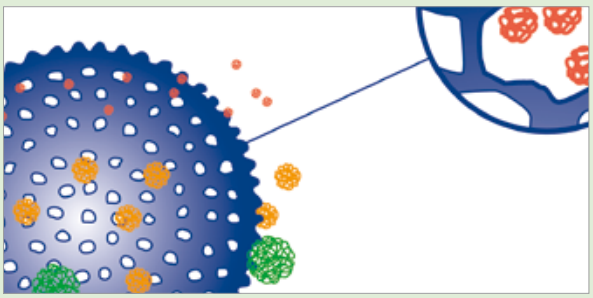


▶ AZURA Compact Bio LC

- Pump with a flow rate of up to 10 ml/min or 50 ml/min
- UV detector with variable wavelength (190 – 500 nm)
- Manual injection valve

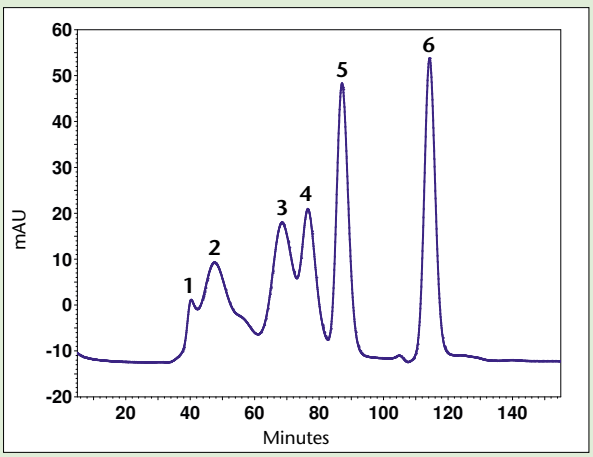
AZURA Compact Bio LC Application

Separation of a protein standard by size exclusion chromatography (SEC)



Material and column dimension

BioFox 17/1200 SEC, Pre-packed column 300 x 8 mm ID , 15 ml	
Buffer:	20 mM sodium phosphate buffer pH 7.0, 300 mM NaCl
Gradient:	isocratic
Flow rate:	0.125 ml/min
Temperature:	ambient
Injection volume:	10 µl
Sample:	size exclusion chromatography standard (BioRad 151-190)



1	Aggregate
2	Thyroglobulin 670 kDa
3	gamma-Globulin 158 kDa
4	Ovalbumin 44 kD
5	Myoglobulin 17 kDa
6	Vitamin B12 1.35 kDa

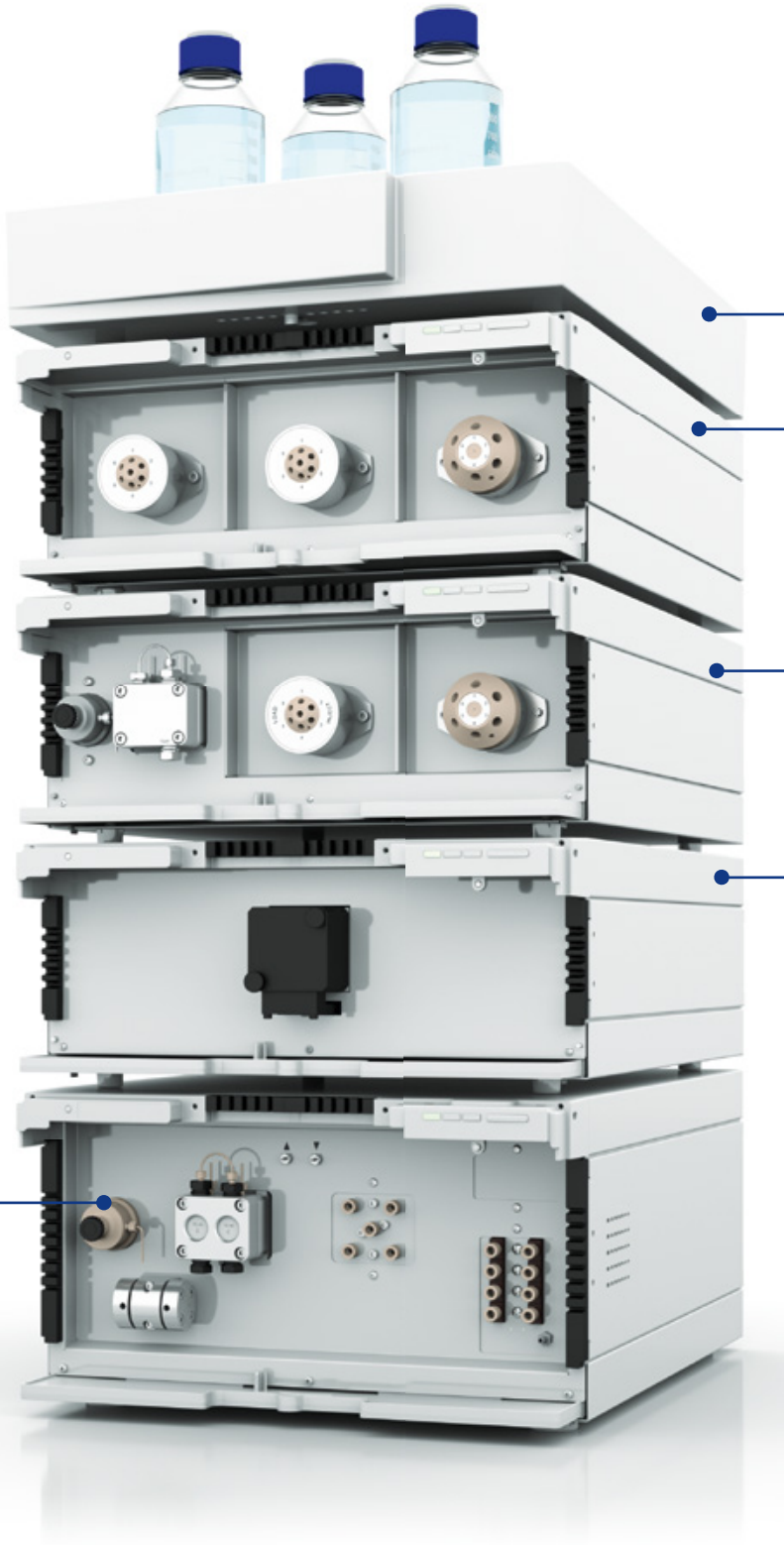
How customizable is your LC purification system?

AZURA Lab Bio LC

AZURA Lab Bio LC is available as isocratic, low pressure gradient (LPG), or high pressure gradient (HPG) system for the purification of biomolecules on a laboratory scale. All modules can be freely combined so that for any task the desired device configuration can be compiled. With AZURA Lab Bio LC you can choose your method:

- Affinity chromatography
- Size exclusion chromatography
- Ion exchange chromatography
- Hydrophobic interaction chromatography
- Mixed mode chromatography

The AZURA Bio LC pump can be combined with different assistant modules for sample injection, column switching, peak parking and additional buffer and sample selection as well as fractionation. Detectors, monitors and a wide flow cell range enable you to perform accurate detection accompanied by pH and conductivity monitoring regardless of your flow rate. An optional fraction collector is available with or without benchtop cooling.



Quaternary LPG Pump P 6.1L with online degasser and buffer blending valve

(... page 10)

Eluent Tray with tubing guides

Assistant ASM 2.1L for switching tasks

Assistant ASM 2.1L with sample pump and valves for injection and switching

(... page 14)

UV/VIS Detector UVD 2.1L with variable wavelength

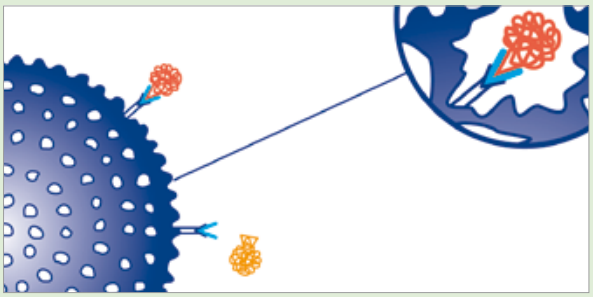
(... page 12)

Tailor your system to make your work easier

- AZURA Assistant devices may be configured for column switching, peak parking, fraction collection, or as a cost effective isocratic FPLC module: AZURA Compact Bio LC
- Choose a specific detector depending on your target molecule (UV, conductivity/pH, fluorescence)
- Choice of AZURA pumps depending on your method and desired flow rate
- Optional benchtop cooling of glass column and fraction collector
- Combinable with all common FPLC columns

AZURA Lab Bio LC Application

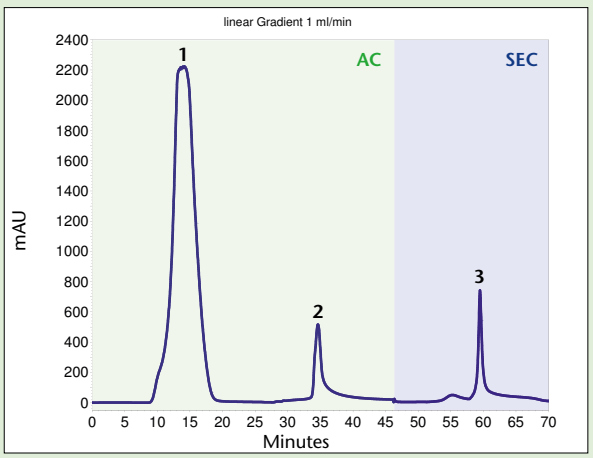
Automated purification of human antibodies (IgG) by affinity chromatography (AC) and successive size exclusion chromatography (SEC)



Material and column dimension

Hi Trap Protein G, Protein G Sepharose High Performance, 34 µm, 5 ml
BioFox 17/1200 SEC, 300 x 8 mm ID, 15 ml

Buffer:	A 20 mM Sodium phosphate buffer pH 7.5		
	B 100 mM Glycin HCL, pH 2.7		
	C 20 mM Sodium phosphate buffer pH 7.0		
Method:	Gradient		Flow rate
Affinity chromatography Injection and Washing	0–26 min	100 % A	0.5 ml/min
Gel filtration	26–46 min	100 % B	2 ml/min
Elution and Peak- Parking			
	46–86 min	100 % C	1 ml/min
Re-injection			
Temperature:	ambient		
Injection volume:	500 µl		
Sample:	human serum		

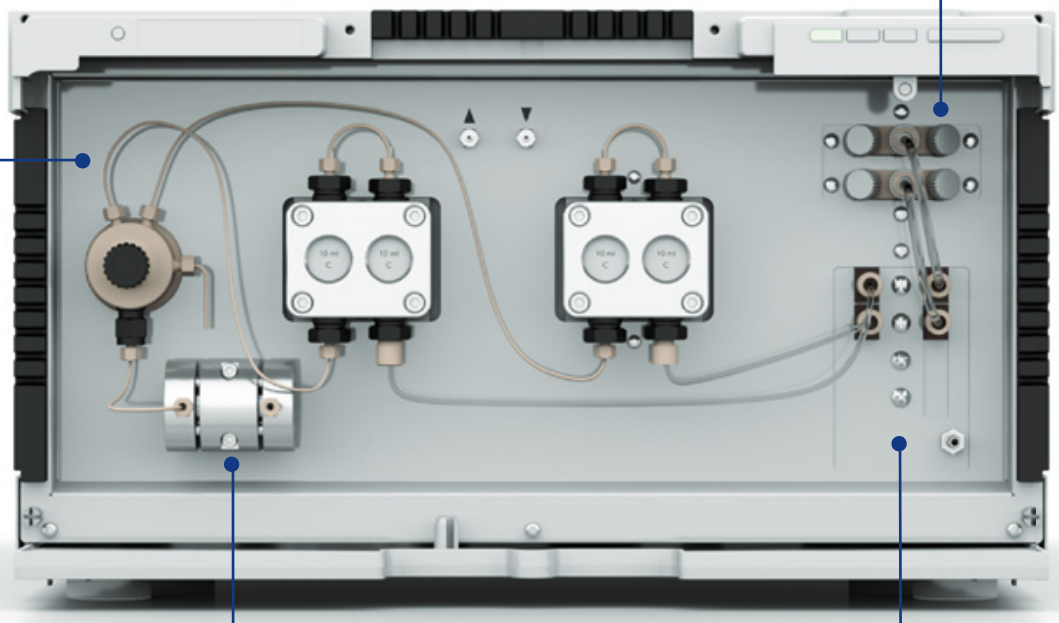


1 Injection peak affinity chromatography
2 Elution peak human IgG affinity chromatography
3 Elution peak human IgG gel filtration

Choose the gradient and flow rate capabilities you need

Pressure Sensor with Inline Filter
system protection

Buffer Selection Valve
two channels for higher flexibility



AZURA Mixer
highest mixing efficiency

2-Channel Online Degasser
reduces baseline noise

▶ AZURA Pump P 6.1L

Binary FPLC Pump (high pressure gradient)

- Flow rate range: 0.001 – 50 ml/min
- Up to 400 bar
- Pump heads: 10 or 50 ml/min
- Automatic recognition of pump heads via RFID
- Biocompatible, metal-free wetted parts
- Binary gradient with solvent selection valve (2 x 2 buffers)

www.knauer.net/biopumps

AZURA Pump P 6.1L

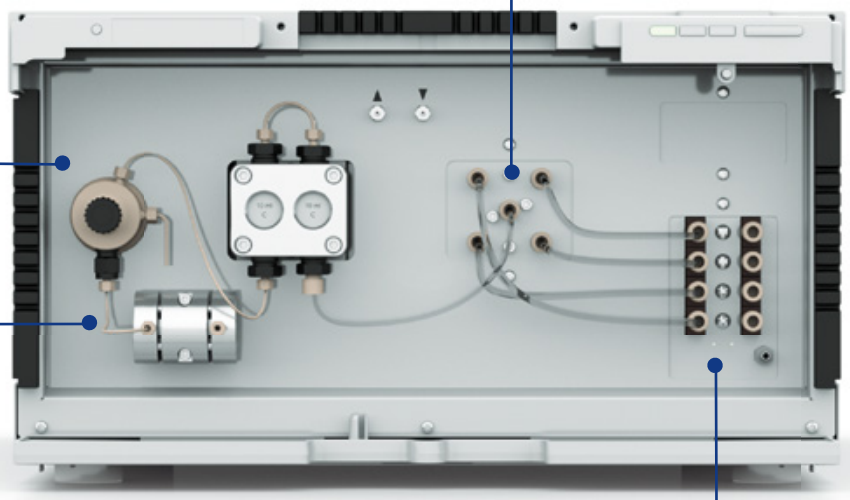
Quaternary FPLC Pump (low pressure gradient)

- Flow rate range: 0.001 – 10 ml/min
- Up to 400 bar
- Biocompatible, metal-free wetted parts
- Quaternary gradients (4 x 1 buffers)

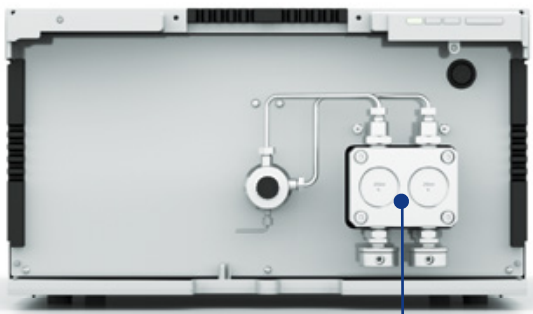
Multi-Proportioning Valve
precise blending of buffers

Pressure Sensor with Inline Filter
system protection

AZURA Mixer
highest mixing efficiency



4-Channel Online Degasser
reduces baseline noise



Exchangeable Pump Heads

AZURA Pump P 2.1L

Isocratic FPLC Pump

- Flow rate range: 0.1 – 1000 ml/min
- Pump heads with titanium wetted parts
- Gradient options: binary high pressure blending (2 x 1 buffers) with an additional P 2.1L or cost-effective binary low pressure blending (2 x 1 buffers) or ternary low pressure blending (3 x 1 buffers, up to 220 ml/min)

Which detector do you need for your target molecules?

AZURA Detector DAD 6.1L

Diode Array Detector

- User friendly and easy maintenance
- LightGuide technology
- Extended wavelength range 190 – 1000 nm
- Impressive sensitivity/price ratio
- Fiber optics version available

"Versatility through a wide flow cell range"

"Robust multi-channel UV/VIS detector"

BlueShadow Detector 50D

Multiple Wavelength Detector

- Simultaneous measurement of up to 4 wavelengths
- Wavelength range from 190 – 750 nm (extended wavelength range version 190 – 900 nm also available)
- Wide linear range

AZURA Detector UVD 2.1L

Variable Wavelength Detector

- Wavelength range from 190 – 750 nm
- Large choice of flow cells
- Fiber optics version available

"Reliable UV/VIS detector for a wide spectrum of applications"

www.knauer.net/biodetect

AZURA Detector UVD 2.1S

Small Variable Wavelength Detector

- Very small and compact design
- Price attractive
- Can be used in an AZURA Assistant
- Wavelength range from 190 – 500 nm
- Fiber optics version available

"Compact and versatile UV detector "

Flow cells for UV/VIS and DAD detectors

- Flow cells are available for analytical, semi-preparative and preparative applications
- Exchanging flow cells is easy due to frontal access
- Fiber optic versions offer the possibility to separate the flow cell spatially from the device providing enhanced security for hazardous, explosive or toxic work processes

Type	Capillary connection	Path length	Volume	Max. flow rate	Max. pressure	Wetted materials	
Analytical	1/16"	10 mm	2 µl	5 ml/min	100 bar	PEEK, synthetic quartz glass, Teflon	Available only for DAD 6.1L
High sensitivity analytical	1/16"	50 mm	6 µl	5 ml/min	100 bar	PEEK, synthetic quartz glass, Teflon	Available only for DAD 6.1L
Semi-preparative	1/16"	3 mm	2 µl	50 ml/min	30 bar	PEEK, synthetic quartz glass, Teflon	Fiber optics version also available
Preparative	1/16"	0.5 mm	3 µl	250 ml/min	100 bar	PEEK, synthetic quartz glass, Teflon	Fiber optics version also available
Preparative	1/8"	Variable	Variable	1000 ml/min	100 bar	PEEK, synthetic quartz glass, Teflon	Fiber optics version also available
Preparative	3/8" with TRI-Clamp connection	7 mm			10 bar	PTFE, fused silica	Available only as fiber optics version
Preparative	3/8" with TRI-Clamp connection	10 mm			10 bar	PTFE, fused silica	Available only as fiber optics version

"Basic and versatile monitor for biopurification applications"

AZURA CM 2.1S

Conductivity Monitor

- For the monitoring of conductivity and pH
- Flow rates up to 100 ml/min
- 1 µS/cm – 999 mS/cm
- pH range 2 – 12

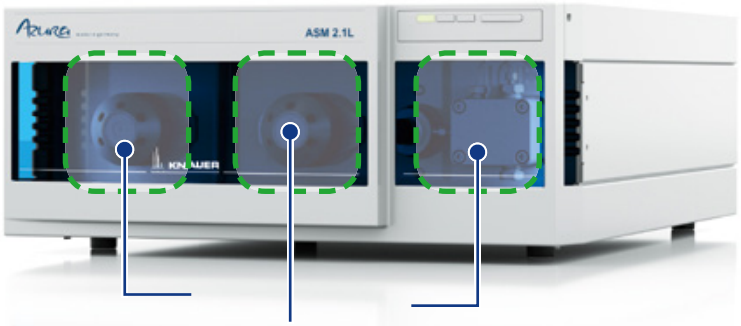
Flow cells for CM 2.1S	Capillary connection	Max. flow rate	Max. pressure
Analytical	1/16"	10 ml/min	160 bar
Preparative	1/16"	100 ml/min	100 bar

How often have you wished for an assistant?

AZURA ASM 2.1L

Injection Module Assistant

- Sample pump and automatic injection valve included
- Injection via a syringe and sample loop or directly via the sample pump
- Injection of different sample amounts from small to large
- Sample pump up to 50 ml/min
- Pump also usable for column filling
- Optional: 6 port valve for buffer- or sample selection or fraction collection



Equipped with combinations of valves, pump(s), or detector

AZURA ASM 2.1L

Column Switching Assistant

- Two column switching valves included
- For up to 6 different columns or up to 5 different columns and bypass
- Optional: 6 port valve for buffer- or sample selection or fraction collection

AZURA ASM 2.1L

Peak Parking Assistant

- Two automatic injection valves included
- Makes peak parking possible
- Enables back flushing of columns
- Optional: 6 port valve for buffer selection or fraction collection

www.knauer.net/asmbio

Collecting your products

Depending on the number of fractions and volumes to be collected, you can pick either a fraction collector or a fractionation valve to save your precious products.

Fractionation Valves

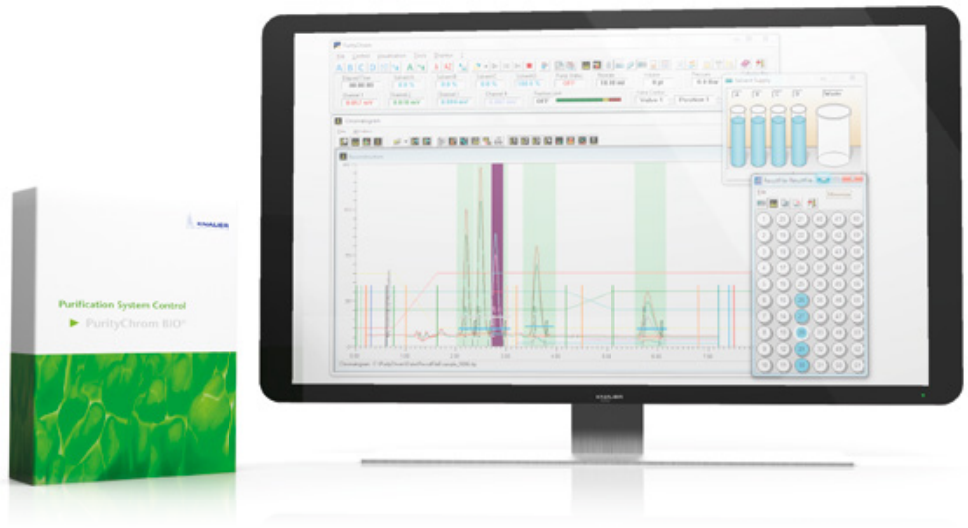
- For collecting large quantities
- Up to 5 fractions and waste
- Available as a single device or integrated into an ASM 2.1L

Fraction Collectors available

- For up to 288 fractions
- Choice of rack capacities from two 96-well microplates up to nine 480 ml bottles
- Cooling optional

www.knauer.net/fractionation

Do you like to measure based on volume or time?



▶ PurityChrom® Bio

User Friendly Bio LC Software

- Flexible Method development based on volume, column volume or time
- Safety features with “hold function” during running method, display of solvent supply and waste management
- Approved: 21 CFR part 11

Other supported chromatography data systems with purification function:

- ClarityChrom, a cost-effective and time-based CDS
- OpenLAB EZChrom Edition, a time-based client/server CDS for large networked laboratories

www.knauer.net/softwarebio

Your FPLC at your finger tips!

AZURA Mobile Control enables the control of AZURA Bio liquid chromatography devices. AZURA Mobile Control displays all important parameters of AZURA devices on one screen and works conjointly with the chromatography data system OpenLAB and ClarityChrom. The integrated user management ensures that parameters can only be changed by authorized operators. Device settings can be easily changed with sliders or by entering numeric values, for each device and your complete AZURA LC system. A graphical overview of method parameters makes the programming very convenient.

Download your demo version here:
www.knauer.net/mobilecontrol

Pre-packed glass columns for SEC and IEC

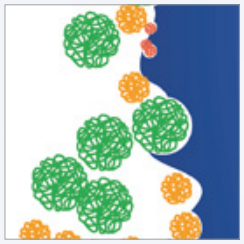
Ready-to-use glass columns for FPLC are available with different BioFox agarose media.

go to pre-packed FPLC columns

www.knauer.net/packedglass

BioFox separation media

Separation media for AC, IEC, IMAC or SEC with a pressure stability up to 40 bar (580 psi) for fast and high resolution biochromatography.



go to BioFox separation media

www.knauer.net/biofox

Bioline glass columns

Bioline glass columns for protein chromatography offer axial compression, high pressure stability, and a thermostatic jacket for easy cooling and heating.

go to high-resolution glass columns

www.knauer.net/glasscolumns

Column rack

Designed specifically for Bioline high resolution glass columns, the Bioline column rack can also accomodate any conventional LC or MPLC columns.

go to Bioline column rack

www.knauer.net/fplc-rack

Application support

Benefit from our long experience in analytical and preparative chromatography and contact us for

application support or method development

www.knauer.net/appsupp

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