

PEPTIDE SUBSTRATES
BIOCHEMICALS
INHIBITORS
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KITS & REAGENTS

Product Catalog



pentapharm

V03_04_2024

Peptide Substrates

Pentapharm has developed assay methods to test for serine proteinase activity in research, in-process control and quality control. Pefachrome® and Pefafluor® are trademarks for a series of chromogenic and fluorogenic substrates from Pentapharm. The activity of proteinases can be quickly and accurately determined and monitored by use of these peptide substrates.



Pefachrome®

Specific synthetic chromogenic peptide substrates for the measurement of the activity of various serine proteases in the field of:

- Coagulation
- Fibrinolysis
- Kallikrein-kinin system
- Complement system

The chromogenic peptides are also used in quality control of pharmaceutical and other preparations.

Packaging: 25 mg, 1 g, 5 g (further packaging on request)

Product	Chemical Formula	Properties	Article No.
Substrate for Thrombin			
Pefachrome® TH 5244	Tos-Gly-Pro-Arg-pNA · AcOH	Km (human Thrombin) 25.60 µM Km (bovine Thrombin) 34.63 µM Vmax (human Thrombin) 0.80 µM/min Vmax (bovine Thrombin) 0.97 µM/min Kcat (human Thrombin) 978.62 min ⁻¹ Kcat (bovine Thrombin) 1185.16 min ⁻¹	081-01
Pefachrome® TH	H-D-CHG-Ala-Arg-pNA · 2AcOH	n.a.	081-03
Pefachrome® TH 5247	H-D-CHG-But-Arg-pNA · 2AcOH	n.a.	081-05
Pefachrome® TH 5251	H-D-CHA-Ala-Arg-pNA · 2AcOH	Km (human Thrombin) 20.34 µM Km (bovine Thrombin) 42.11 µM Vmax (human Thrombin) 0.72 µM/min Vmax (bovine Thrombin) 1.18 µM/min Kcat (human Thrombin) 882.86 min ⁻¹ Kcat (bovine Thrombin) 1447.42 min ⁻¹	081-09
Pefachrome® FXIIa/TH 5253	H-D-CHA-Gly-Arg-pNA · 2AcOH	Km (human Thrombin) 49.80 µM Km (bovine Thrombin) 78.66 µM Vmax (human Thrombin) 1.23 µM/min Vmax (bovine Thrombin) 1.60 µM/min Kcat (human Thrombin) 1503.49 min ⁻¹ Kcat (bovine Thrombin) 1954.58 min ⁻¹	081-11
Pefachrome® TH 5256	CH3OCO-Gly-Pro-Arg-pNA · AcOH	Km (human Thrombin) 44.84 µM Km (bovine Thrombin) 38.62 µM Vmax (human Thrombin) 0.04 µM/min Vmax (bovine Thrombin) 0.04 µM/min Kcat (human Thrombin) 53.99 min ⁻¹ Kcat (bovine Thrombin) 48.90 min ⁻¹	081-15
Pefachrome® TH 8198 (corresp. S-2238)	H-D-Phe-Pip-Arg-pNA · 2HCl	Km (human Thrombin) 14.36 µM Km (bovine Thrombin) 22.81 µM Vmax (human Thrombin) 0.67 µM/min Vmax (bovine Thrombin) 0.74 µM/min Kcat (human Thrombin) 823.53 min ⁻¹ Kcat (bovine Thrombin) 909.61 min ⁻¹	081-66
Pefachrome® TH 1206	H-Sar-Pro-Arg-pNA · 2HCl	Km (human Thrombin) 43.33 µM Km (bovine Thrombin) 93.80 µM Vmax (human Thrombin) 0.12 µM/min Vmax (bovine Thrombin) 0.15 µM/min Kcat (human Thrombin) 149.45 min ⁻¹ Kcat (bovine Thrombin) 188.94 min ⁻¹	801206
Substrate for the determination of Thrombin generation			
Pefachrome® TG	H-B-Ala-Gly-Arg-pNA · 2AcOH	Km 1.95 µM Kcat 1.91 s ⁻¹	081-17
Substrate for Urokinase			
Pefachrome® uPA 8294 (corresp. S-2444)	Pyroglu-Gly-Arg-pNA · HCl	Km 6 µM Vmax 1.3·10 ⁻¹⁰ µM/min	082-33

Product	Chemical Formula	Properties	Article No.
Substrate for Plasmin			
Pefachrome® PL/Tryp 5261	Tos-Gly-Pro-Lys-pNA · AcOH	n.a.	083-01
Pefachrome® PL 5262	H-D-But-CHA-Lys-pNA · 2AcOH	n.a.	083-02
Pefachrome® PL 5263	H-D-Nva-CHA-Lys-pNA · 2AcOH	n.a.	083-03
Pefachrome® PL 5264	H-D-Nle-CHA-Lys-pNA · 2AcOH	n.a.	083-04
Pefachrome® PL 5272	H-D-Nle-CHA-Lys-pNA · 2HCl	n.a.	083-14
Substrate for Trypsin			
Pefachrome® TRY 5274	Cbo-Val-Gly-Arg-pNA · AcOH	Km 0.181 µM Vmax 43.3 µM/min	084-01
Pefachrome® 6047 (BAPNA)	Bz-DL-Arg-pNA · AcOH	n.a.	090-07
Substrate for Trypsase			
Pefachrome® PL/Tryp 5261	Tos-Gly-Pro-Lys-pNA · AcOH	n.a.	083-01
Substrate for the determination of bacteria endotoxins			
Pefachrome® FXa/LAL 5288	CH3OCO-D-CHA-Gly-Arg-pNA · AcOH	n.a.	085-06
Pefachrome® LAL 5288	CH3OCO-D-CHA-Gly-Arg-pNA	n.a.	086-11
Pefachrome® LAL 2423	Ac-Ile-Glu-Gly-Arg-pNA · TFA	n.a.	801741
Pefachrome® LAL 2834	Ac-Ile-Glu-Gly-Lys-pNA · TFA	n.a.	802143
Substrate for C1-esterase			
Pefachrome® C1E 5292	C2H5CO-Lys(Cbo)-Gly-Arg-pNA · AcOH	n.a.	087-01
Pefachrome® C1E 5603	CH3CO-Lys(Cbo)-Gly-Arg-pNA · AcOH	n.a.	087-03
Substrate for activated protein C			
Pefachrome® PCa	H-D-Lys(Cbo)-Pro-Arg-pNA · 2AcOH	Km 0.303 µM Vmax 25 µmol/ml Protein C/min	089-02
Pefachrome® PCa 5297	Pad-Pro-Arg-pNA · AcOH	n.a.	089-07
Substrate for tPA			
Pefachrome® tPA	CH3SO2-D-CHA-Gly-Arg-pNA · AcOH	Km sc-tPA 0.286 µM Km tc-tPA 0.167 µM Vmax sc-tPA 6.95 µmol/µg tPA/min Vmax tc-tPA 33.9 µmol/µg tPA/min	091-01
Pefachrome® tPA 5312	CH3SO2-D-Phe-Gly-Arg-pNA · AcOH	n.a.	091-03
Substrate for Factor VIIa			
Pefachrome® FVIIa	CH3SO2-D-CHA-But-Arg-pNA · AcOH	Km (without TF) 5.0 µM Km (with TF:Ratio VIIa / TF:≈1/10) 0.97 µM Vmax (without TF) 6.72 µmol/min Vmax (with TF:Ratio VIIa / TF:≈1/10) 69.7 µmol/min	093-01
Substrate for Factor IXa			
Pefachrome® FIXa	CH3SO2-D-CHG-Gly-Arg-pNA · AcOH	Km 1.3 µM Kcat 4.4 s ⁻¹	095-20
Substrate for Factor XIa			
Pefachrome® FXIa	Z-Aad-Pro-Arg-pNA · AcOH	Km 0.266 µM Vmax 5.7 µM/min	090-41
Substrate for Factor Xa			
Pefachrome® FXa 5277	CH3SO2-D-Leu-Gly-Arg-pNA · AcOH	Km (human FXa) 233 µM Km (bovine Thrombin) 154 µM Vmax (human FXa) 0.736 µM/min Vmax (bovine FXa) 0.141 µM/min Kcat (human FXa) 5643 min ⁻¹ Kcat (bovine FXa) 1080 min ⁻¹	085-01
Pefachrome® FXa 5279	CH3OCO-D-CHG-Gly-Arg-pNA · AcOH	Km (human FXa) 97 µM Km (bovine FXa) 118 µM Vmax (human FXa) 0.598 µM/min Vmax (bovine FXa) 0.149 µM/min Kcat (human FXa) 4589 min ⁻¹ Kcat (bovine FXa) 1145 min ⁻¹	085-03
Pefachrome® FXa/LAL 5288	CH3OCO-D-CHA-Gly-Arg-pNA · AcOH	Km (human FXa) 164 µM Km (bovine FXa) 168 µM Vmax (human FXa) 0.937 µM/min Vmax (bovine FXa) 0.190 µM/min Kcat (human FXa) 7143 min ⁻¹ Kcat (bovine FXa) 1455 min ⁻¹	085-06
Pefachrome® FXa 8595 (corresp. S-2765)	Z-D-Arg-Gly-Arg-pNA · 2HCl	Km (human FXa) 60 µM Km (bovine FXa) 103 µM Vmax (human FXa) 0.710 µM/min Vmax (bovine FXa) 0.315 µM/min Kcat (human FXa) 5441 min ⁻¹ Kcat (bovine FXa) 2481 min ⁻¹	085-27

Product	Chemical Formula	Properties	Article No.
Substrate for Factor Xa (continued...)			
Pefachrome® FXa 5278	CH3OCO-D-Nle-Gly-Arg-pNA · AcOH	n.a	085-50
Pefachrome® FXa 2732 (corresp. S-2732)	Suc-Ile-Glu(gamma-Pip)-Gly-Arg-pNA · HCl	Km (human FXa) 176 µM Km (bovine FXa) 163 µM	802893
		Vmax (human FXa) 0.779 µM/min Vmax (bovine FXa) 0.134 µM/min	
		Kcat (human FXa) 5976 min ⁻¹ Kcat (bovine FXa) 1028 min ⁻¹	
Substrate for Factor XIIa			
Pefachrome® FXIIa/TH 5253	H-D-CHA-Gly-Arg-pNA · 2AcOH		081-11
Pefachrome® 6017	H-D-CHA-Gly-Arg-pNA · 2AcOH		081-45
Substrate for plasma kallikrein			
Pefachrome® PK6001	Bz-Pro-Phe-Arg-pNA · AcOH	n.a	080-01
Pefachrome® PK	H-D-But-CHA-Arg-pNA · 2AcOH	Km 0.175 µM Vmax 7.48 µM/min	080-03

Amperogenic

Amperogenic peptide substrates are used in electrochemical sensors.

The substrates carry 4-amido-2-chloro-phenol as a leaving group and upon cleavage by the target enzyme, the redox potential change can be measured with an electrode, e.g. in a point-of-care device.

Product	Chemical Formula	Packaging Unit	Article No.
Amperogenic Thrombin substrate	Tos-Gly-Pro-Arg-4-Amido-2-Chloro-Phenol · AcOH	Vial 25 mg	602-01

Pefafleur®

Fluorogenic peptide substrates for use in research, in-process and quality control.

The fluorogenic group is AMC, 7-Amino-4-methylcoumarin. The optical characteristics of AMC are:

- Absorption maximum wavelength of approx. 342 nm
- Emission maximum wavelength of approx. 440 nm

Product	Chemical Formula	Packaging Unit	Article No.
Substrate for Thrombin			
Pefafleur® TH	Z-Gly-Gly-Arg-AMC · HCl	Vial 25 mg	801058
Pefafleur® TH	H-D-CHA-Ala-Arg-AMC · 2AcOH	Vial 25 mg	081-19
Substrate for Factor Xa			
Pefafleur® FXa	CH3SO2-D-CHA-Gly-Arg-AMC · AcOH	Vial 25 mg	085-12
Substrate for the determination of bacterial endotoxins			
Pefafleur® LAL 5291	CH3SO2-D-CHA-Gly-Arg-AMC · AcOH	Vial 25 mg	086-04
Substrate for activated protein C			
Pefafleur® PCa	Pyroglu-Pro-Arg-AMC · AcOH	Vial 25 mg	089-05
Substrate for tPA			
Pefafleur® tPA	CH3SO2-D-Phe-Gly-Arg-AMC · AcOH	Vial 25 mg	091-06
Substrate for Factor IXa			
Pefafleur® FIXa	CH3SO2-D-CHG-Gly-Arg-AMC · AcOH	Vial 25 mg	095-03

Biochemicals

Pentapharm manufactures selected standardized biochemical products for:

- Research
- Production
- In-process control
- Quality control
- Analytical applications
- Purification processes



Prionex®

Prionex® is a porcine collagen peptide fraction and has multiple advantages:

- Optimizes stability of biological activity
- Improves conditions for lyophilisation and heat treatment
- Does not contain bovine-derived materials
- Avoids denaturation by chaotropic agents or solvents
- Extends shelf life for enzymes and proteins
- Additive-free
- High consistency stabilizer

Product	Packging Unit	Article No.
Prionex® 10%	Bottles 100 ml, 500 ml, 1'000 ml	069-03
Prionex® Pellets	Vial 1g, 5g	802943

Rabbit brain cephalin

Rabbit brain cephalin consists of phospholipids isolated from rabbit brain. It can be used as a phospholipid source in phospholipid dependent coagulation assays.

The main components are:

- Phosphatidylserine
- Phosphatidylethanolamine
- Phosphatidylethanolcholine

Product	Packging Unit	Article No.
RB Cephalin, freeze dried	Vial 100 mg, 1g	801682

Inhibitors

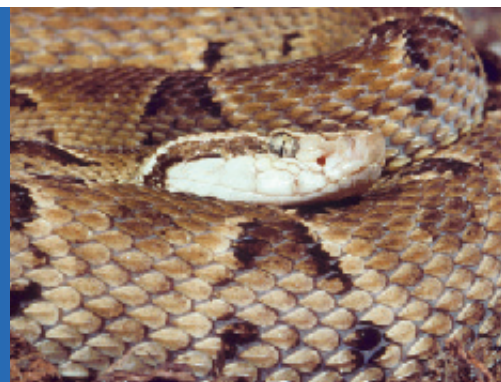
Pentapharm offers a series of protease inhibitors. The inhibitors are applied to protect specific proteins from proteolytic degradation or to remove undesired proteolytic activity and subsequently increase specificity of proteases or of chromogenic substrate assays.

Product	Chemical Formula	Packaging Unit	Article No.
Inhibits serine proteases			
Aprotinin Conc. Solution	n.a.	Vial 50 ml, 1'000 ml	073-70
Aprotinin Powder, lyoph.	n.a.	Vial 1 g (ca. 6 Mio.KIU)	800277
Pefabloc® SC	C8-H10FNO2S · HCl	Vial 1 g, 10 g	399-01
Inhibits fibrin polymerization			
Pefabloc® FG	H-Gly-Pro-Arg-Pro-OH · AcOH	Vial 50 mg, 1 g	099-01
Inhibits plasma kallikrein			
Pefabloc® PK	C24-H26N4O3S · HCl	1 mg	380-03
Inhibits Thrombin			
Pefabloc® TH (α-NAPAP)	C27-H31N5O4S · AcOH	Vial 5 mg	381-01
r-Hirudin EC	n.a.	Vial 2000 ATU	126-10
r-Hirudin	n.a.	Vial 2000 ATU	126-11

Snake venom enzymes

Pentapharm manufactures highly purified snake venom components, which either activate or inactivate specific components of the plasma coagulation or fibrinolysis system, or show a specific interaction with such components. Isolated snake venom proteins can be used in coagulation and platelet aggregation tests, in photometric assays as well as in immunological systems for:

- Research
- Analytical applications
- Diagnostic purpose
- Quality control



For the determination of fibrinogen

Product	Packging Unit	Article No.
Batroxobin maranhao	Vial 100 BU	101-04
Batroxobin maranhao	Vial 1'000 BU	101-06

Fast acting protein C activator

Product	Packging Unit	Article No.
Protac®	Vial 3 U	113-01
Protac® lyophilized Bulk	Vial 500 U, 1'000 U	113-04
Protac® solution	Bulk 10 U/ml	113-05

For the determination of prothrombin and hirudin, specifically activates prothrombin via meizothrombine

Product	Packging Unit	Article No.
Ecarin	Vial 50 EU	116-01

For activation of human platelets via GPVI-receptor, studies on platelets receptors

Product	Packging Unit	Article No.
Convulxin	Vial 50 µg	119-02

For activation and determination of Factor V

Product	Packging Unit	Article No.
RVV Factor V-Activator	Vial 1'000 U	121-03

For the determination of Factor X and for screening of Lupus Anticoagulants

Product	Packging Unit	Article No.
RVV Factor X-Activator	Vial 5 U	121-06
RVV Factor X-Activator	Vial 50 U	121-07



Kits and Reagents

Pentapharm develops and manufactures reagents and test systems for coagulation and fibrinolysis

Pefakit® APC-R Factor V Leiden is a plasma based functional assay for the determination of resistance of Factor Va to inactivation by activated protein C (APC) caused by the factor V Leiden mutation.

CE/FDA 510 (k)

Control plasmas for confirmation of Factor V Leiden mutation (FV:Q) in assays for determination of the functional phenotype for activated protein C resistance caused by the factor V Leiden mutation.

CE/FDA 510 (k)

Product	Pack	Article No.
Pefakit® APC-R Factor V Leiden	3 x 2 ml APC/RVV-V (+APC) Reagent	502-01; for US 502-02
	3 x 2 ml RVV-V (-APC) Reagent	
	3 x 4 ml PTA Reagent	
	3 x 2 ml Dilution Plasma	
Pefakit® APC-R Factor V Leiden Controls	3 x 1 ml FV-L Negative Control	502-21; for US 502-22
	3 x 1 ml FV-L Heterozygous Control	

Pefaclo™ UFH is a plasma based functional assay for the determination of unfractionated heparin (UFH).

CE/US and CA for research use only

Product	Pack	Article No.
Pefaclo™ UFH	3 x 2 ml Activator	505-50
	3 x 2 ml Start Reagent	
Pefaclo™ UFH - RUO for Research Use Only	3 x 2 ml Activator	505-50-R
	3 x 2 ml Start Reagent	
Pefaclo™ UFH Controls	3 x 1 ml Control UFH 1	505-60
	3 x 1 ml Control UFH 2	

For the investigation of the last phase of blood coagulation. Due to its heparin insensitivity, the Reptilase® Time can detect fibrinogen polymerization disorders even in the presence of heparin.

CE/US and CA for research use only

Product	Pack	Article No.
Pefakit® Reptilase® Time	3 x 1 ml Reptilase Time Reagent	800191
Pefakit® Reptilase® Time – RUO for Research Use Only	3 x 1 ml Reptilase Time Reagent	800191-R

Pefakit® TAFI is a plasma based chromogenic assay for determination of Thrombin Activatable Fibrinolysis Inhibitor (TAFI) activity.

For research use only

Product	Pack	Article No.
Pefakit® TAFI	2 x 4 ml Activator	800186
	2 x 4 ml Start Reagent	
	2 x 4 ml Diluent	
Pefakit® TAFI Calibrator and Controls	1 x 1 ml Calibrator	800187
	1 x 1 ml Control 1	
	1 x 1 ml Control 2	



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IMMUNOLOGIE • MOLEKULARBIOLOGIE
BIOCHEMIE • PRODUKTE UND SYSTEME

Gerhart-Hauptmann-Str. 48
69221 Dossenheim
Tel +49 6221 868023
Fax +49 6221 8680255
www.loxo.de - info@lox.de

CONTACT US

Pentapharm AG

Dornacherstrasse 112 | CH-4147 Aesch BL | Switzerland
T 41 61 706 4848 | E pentapharm@pentapharm.com

EC **REP** Emergo Europe B.V., Prinsessegracht 20
2514 AP The Hague, The Netherlands

AMERICA | DSM-Firmenich Pentapharm

45 Waterview Boulevard | Parsippany | NJ 07054 | USA
T 973-257-8556 | E pentapharm@pentapharm.com

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