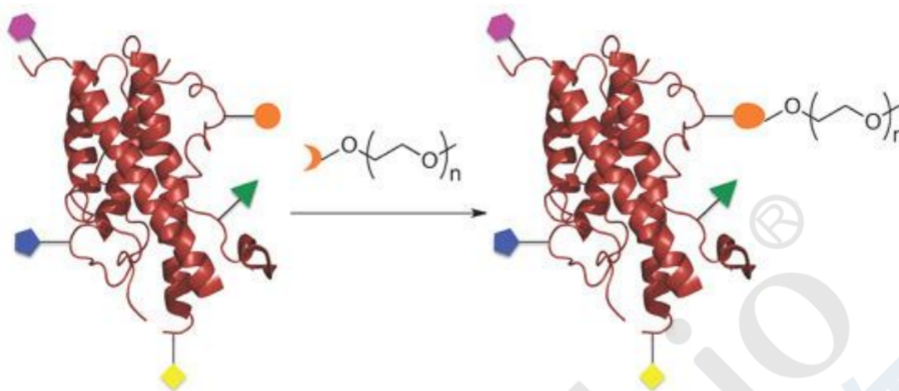


修饰性 PEG 及重组蛋白药物中间体产品系列

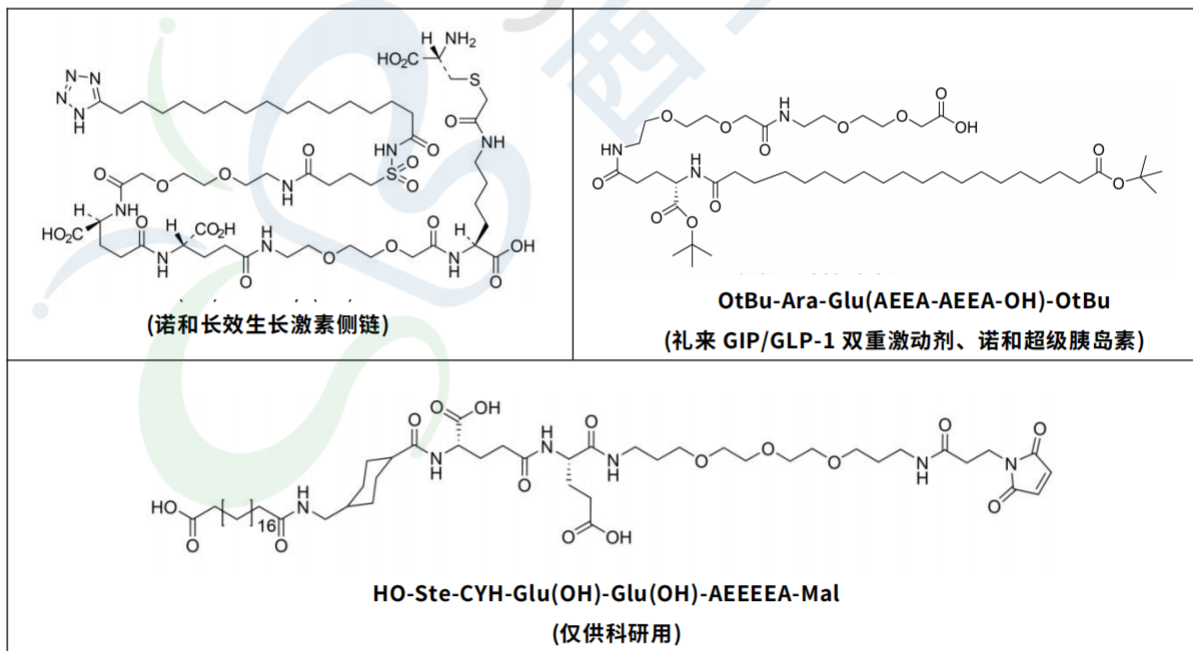
Seebio 提供从磷脂 PEGs 到荧光 PEGs 的多种选择，种类齐全，产品线丰富。

同时具备重组蛋白药物中间体开发和产（CRO&CDMO）能力。



PEG 修饰的蛋白质[1]

聚乙二醇（PEGs） 由于低免疫原性，良好的水溶性及生物相容性，是生物医学中使用最多的聚合物，其“隐身”效应是生物材料的“金标准”。PEGs 对蛋白药物修饰途径主要有氨基修饰（包括 N 端氨基的酰化修饰、赖氨酸侧链氨基的酰化修饰、N 端氨基的烷基化修饰）、羧基修饰、巯基修饰等。目前，PEG 修饰蛋白质类药物的研究主要集中于腺苷脱氨酶、天冬酰胺酶、干扰素、粒细胞集落刺激因子、白细胞介素等。



经 PEG 共价修饰后，蛋白质药物的半衰期得到延长、免疫原性降低，同时最大限度地保留其生物活性，提高了药效：

- 分子半径增大，肾清除速率下降。
- PEG 在蛋白表面起到了屏蔽和位阻效应，酶解速率降低，稳定性提高，半衰期延长。

- 屏蔽和位阻效应还可以掩盖蛋白质表面的抗原位点，降低了蛋白质的免疫原性。
- 增加了药物在体液中的溶解性。
- 与药物的化学键在体内随时间水解，缓慢释放药物^[2]。

PEGs-modified protein approved FDA. Site-specific PEGylated proteins given in bold ^[3]

Drug	Protein	Protein Size (kDa)	PEG Size (kDa)	Functional Group on PEG	Site of Attachment	Site-Specific	Year of Approval	Use
Adagen®	Adenosine deaminase	40	5	Succinimidyl ester	Lysines, serines, tyrosines, histidines	No	1990	Severe combined immunodeficiency disease
Oncaspar®	Asparaginase	31	5	Succinimidyl ester	Lysines, serines, tyrosines, histidines	No	1994	Leukemia
PegIntron®	Interferon- α -2b	19.2	12	Succinimidyl ester	Lysines, serines, tyrosines, histidines, cysteines	No, but 47.8% one isomer	2000	Hepatitis C
Pegasy®	Interferon- α -2a	19.2	40	Succinimidyl ester	Lysines	No	2001	Hepatitis C
Neulasta®	Granulocyte colony-stimulating factor (G-CSF)	18.8	20	Aldehyde	N-Terminal amine	Yes	2002	Neutropenia
Somavert®	Human growth hormone (hGH)	22	5	Succinimidyl ester	Lysines, N-terminus, phenylalanine	No	2003	Acromegaly
Mircera®	Erythropoietin	30 (18 unglycosylated)	40	Succinimidyl ester	Lysines	No	2007	Anemia
Cimzia®	Anti-tumor necrosis factor (TNF) α Fab'	51	40	Maleimide	C-Terminal cysteine	Yes	2008	Rheumatoid arthritis, Crohn disease, psoriatic arthritis
Krystexxa®	Urate oxidase	34	10	<i>p</i> -Nitrophenyl carbonate ester	Lysines	No	2010	Gout
Omontys	Synthetic, dimeric peptide (erythropoiesis stimulating agent)	4.9	40 (2 20 kDa chains)	Succinimidyl ester (added during chemical synthesis of the peptide)	Lysines	Yes	2012 (Recalled 2014)	Anemia in chronic kidney disease

【参考文献】

1. K.J. Dozier, D.M. Distefano Int. J. Mol. Sci. 2015, 16(10), 25831-25864
2. F.M. Veronese, G. Pasut. Drug Discov. Today, 2005, 10(21): 1451-1458
3. W.X. Wu, Y. Zhang, et al. Lett Biotechnol, 2006, 17(6): 929-934.

Seebio 修饰性 PEG 产品现货表

Seebio Code	CAS	产品名称	规格 1	规格 2	纯度
AAU0205A	876345-13-0	Boc-NH-PEG4-CH2COOH	250mg	500mg	97%
AAU0206A	951671-87-7	DNP-PEG3-azide	100mg	200mg	98%
AAU0207A	112-35-6	m-PEG3-OH	100g	200g	97%
AAU0208A	756525-95-8	NH2-PEG2-C2-Boc	1g	2g	95%
AAU0209A	581065-95-4	Amino-PEG4-Boc	1g	2g	97%
AAU0210A	1393330-38-5	Bromo-PEG4-acid	1g	2g	97%
AAU0211A	139115-90-5	Azido-PEG2-alcohol	1g	2g	97%
AAU0212A	86520-52-7	Azido-PEG3-alcohol	5g	10g	98%
AAU0213A	305372-39-8	Biotin-PEG2-Mal	100mg	200mg	98%
AAU0214A	1453117-42-4	Tos-PEG4-acid	1g	2g	97%
AAU0215A	86259-87-2	BnO-PEG4-OH	25g	50g	97%

AAU0216A	1312309-63-9	Azido-PEG2-C2-acid	1g	2g	97%
AAU0217A	1446282-18-3	Amino-PEG5-Boc	2g	4g	98%
AAU0218A	252881-74-6	NH2-PEG3-C2-Boc	2g	4g	97%
AAU0219A	1393330-36-3	Bromo-PEG1-C2-Boc	1g	2g	97%
AAU0220A	928292-69-7	Amino-PEG10-amine	1g	2g	97%
AAU0221A	890091-43-7	Boc-amido-PEG9-amine	1g	2g	97%
AAU0222A	1859379-85-3	Propargyl-PEG2-acid	5g	10g	98%
AAU0223A	906099-89-6	Biotin-PEG6-alcohol	1g	2g	97%
AAU0224A	1800414-71-4	Azido-PEG11-amine	1g	2g	97%
AAU0225A	31127-85-2	Bis-PEG4-acid	1g	2g	98%
AAU0226A	518044-37-6	Mal-PEG6-Boc	250mg	500mg	97%
AAU0227A	437655-95-3	Fmoc-NH-PEG4-CH2COOH	5g	10g	98%
AAU0228A	1122484-77-8	NH2-PEG2-C1-Boc	1g	2g	97%
AAU0229A	144942-89-2	Amino-PEG1-C2-acid	5g	10g	98%
AAU0230A	127828-22-2	Amino-PEG2-NH-Boc	1g	2g	98%
AAU0231A	166388-57-4	Azido-PEG2-C2-amine	250mg	500mg	97%
AAU0232A	149299-82-1	Hydroxy-PEG2-CH2-Boc	1g	2g	97%
AAU0233A	1233234-77-9	Boc-NH-PEG11-NH2	100mg	200mg	97%
AAU0234A	208827-90-1	Propargyl-PEG3-alcohol	5g	10g	97%
AAU0235A	287174-32-7	Hydroxy-PEG1-CH2-Boc	1g	2g	97%
AAU0236A	756525-93-6	Mal-amido-PEG8-NHS ester	250mg	500mg	98%
AAU0237A	1008402-79-6	Bis-PEG9-NHS ester	25mg	50mg	98%
AAU0238A	756526-04-2	NH2-PEG9-acid	3g	6g	98%
AAU0239A	1191079-83-0	Amino-PEG9-acid	1g	2g	97%
AAU0240A	872679-70-4	Fmoc-NH-PEG2-CH2CH2COOH	10g	20g	98%
AAU0241A	882847-13-4	Boc-NH-PEG6-CH2CH2COOH	100mg	200mg	97%
AAU0242A	1334169-93-5	Boc-NH-PEG8-CH2CH2COOH	100mg	200mg	97%
AAU0243A	756525-91-4	Boc-NH-PEG4-CH2CH2COOH	100mg	200mg	97%
AAU0244A	1347750-78-0	Boc-NH-PEG5-CH2CH2COOH	100mg	200mg	97%
AAU0245A	1312309-64-0	N3-PEG2-C2-NHS ester	100mg	200mg	97%
AAU0246A	439114-13-3	Bis-PEG5-acid	1g	2g	97%
AAU0247A	875770-34-6	Biotin-PEG3-azide	1g	2g	97%
AAU0248A	31576-51-9	m-PEG2-Amine	1g	2g	98%
AAU0249A	1383814-00-3	Amino-PEG12-Boc	1g	2g	98%
AAU0250A	929-75-9	Amino-PEG3-C2-Amine	1g	2g	95%
AAU0251A	142929-49-5	Boc-NH-PEG1-CH2COOH	1g	2g	97%
AAU0252A	937188-59-5	Hydroxy-PEG4-acid	100mg	200mg	97%
AAU0253A	663171-32-2	Biotin-PEG4-amine	250mg	500mg	98%
AAU0254A	169751-72-8	Hydroxy-PEG4-CH2-Boc	1g	2g	97%
AAU0255A	2100306-71-4	Bromo-PEG3-CH2-Boc	1g	2g	98%
AAU0256A	459426-22-3	Biotin-PEG4-NHS ester	250mg	500mg	97%

AAU0257A	2055042-66-3	Hydroxy-PEG9-Boc	250mg	500mg	98%
AAU0258A	108466-89-3	Boc-NH-PEG2-CH2COOH	1g	2g	97%
AAU0259A	215181-61-6	m-PEG2-azide	5g	10g	97%
AAU0260A	86770-67-4	Azido-PEG4-alcohol	1g	2g	97%
AAU0261A	1895922-74-3	Boc-NH-PEG2-propargyl	250mg	500mg	97%
AAU0262A	87450-10-0	Propargyl-PEG4-alcohol	100mg	200mg	95%
AAU0263A	9004-74-4	m-PEG-OH (MW 2000)	25g	50g	97%
AAU0264A	57641-66-4	Bromo-PEG2-alcohol	5G	10G	97%
AAU0265A	54149-17-6	m-PEG2-Br	5g	10g	97%
AAU0266A	27425-92-9	m-PEG10-alcohol	1g	2g	97%
AAU0267A	2101563-45-3	Fmoc-NH-PEG10-acid	1g	2g	97%
AAU0268A	1257063-35-6	Azido-PEG4-C2-acid	250mg	500mg	97%
AAU0269A	462100-06-7	Boc-NH-PEG3-CH2COOH	1g	2g	97%
AAU0270A	869310-84-9	Propargyl-PEG2-NHBoc	250mg	500mg	97%
AAU0271A	858126-78-0	DNP-PEG4-NHS ester	500mg	1g	97%
AAU0272A	518044-31-0	Hydroxy-PEG3-CH2-Boc	1g	2g	97%
AAU0273A	297162-47-1	Hydroxy-PEG6-CH2-Boc	1g	2g	97%
AAU0274A	955094-26-5	Mal-amido-PEG2-NHS ester	250mg	500mg	97%
AAU0275A	1404111-67-6	N-Boc-PEG5-alcohol	1g	2g	97%
AAU0276A	186020-66-6	Hydroxy-PEG3-(CH2)2-Boc	10g	20g	97%
AAU0277A	791028-27-8	Amino-PEG2-C2-acid	20g	40g	97%
AAU0278A	165963-71-3	N-Boc-PEG3-bromide	1g	2g	97%
AAU0279A	1334177-79-5	Mal-amido-PEG6-acid	1g	2g	97%
AAU0280A	2241669-16-7	NH2-PEG5-C6-Cl (hydrochloride)	1g	2g	97%
AAU0281A	557756-85-1	Fmoc-NH-PEG4-CH2CH2COOH	5g	10g	98%
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AAU0283A	119189-70-7	Bis-PEG6-acid	250mg	500mg	97%
AAU0284A	2388521-20-6	Hydroxy-PEG12-Boc	250mg	500mg	98%
AAU0285A	361189-64-2	Hydroxy-PEG6-Boc	250mg	500mg	97%
AAU0286A	164332-88-1	N-Boc-PEG2-bromide	1g	2g	97%
AAU0287A	929-59-9	Bis-NH2-PEG2	25g	50g	95%
AAU0288A	1818294-42-6	Amino-PEG10-Boc	100mg	200mg	97%
AAU0289A	1334177-80-8	Cbz-NH-PEG6-C2-acid	250mg	500mg	97%
AAU0290A	957486-82-7	Azido-PEG6-amine	250mg	500mg	97%
AAU0291A	1334177-87-5	Cbz-NH-PEG8-C2-acid	100mg	200mg	95%
AAU0292A	361189-66-4	Azido-PEG6-acid	500mg	1g	98%
AAU0293A	1670249-37-2	Azido-PEG9-acid	500mg	1g	98%
AAU0294A	39160-70-8	Amino-PEG6-alcohol	250mg	500mg	97%
AAU0295A	2093153-98-9	Propargyl-PEG9-amine	100mg	200mg	97%
AAU0296A	882518-90-3	Azido-PEG2-CH2COOH	250mg	500mg	97%

AAU0297A	756526-00-8	Cbz-NH-PEG4-C2-acid	250mg	500mg	97%
AAU0298A	1245823-51-1	Propargyl-PEG5-acid	1g	2g	98%
AAU0299A	1425973-14-3	NH2-PEG7	500mg	1g	98%
AAU0300A	1347760-82-0	Propargyl-PEG3-acid	250mg	500mg	97%
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AAU0305A	86770-68-5	Azido-PEG5-alcohol	250mg	500mg	97%
AAU0306A	880129-82-8	Azido-PEG6-CH2COOH	500mg	1g	98%
AAU0307A	1214319-92-2	Azido-PEG8-acid	100mg	200mg	98%
AAU0308A	217180-81-9	Azido-PEG5-CH2CO2H	250mg	500mg	98%
AAU0309A	857891-82-8	Azido-PEG8-amine	250mg	500mg	97%
AAU0310A	5961-83-1	Bis-PEG1-acid	250mg	500mg	98%
AAU0311A	19364-66-0	Bis-PEG2-acid	250mg	500mg	97%
AAU0312A	2411681-88-2	Thalidomide-O-PEG4-NHS ester	250mg	500mg	97%
AAU0313A	82209-36-7	Amino-PEG8-amine	100mg	200mg	98%
AAU0314A	1263045-16-4	Mal-amido-PEG4-acid	500mg	1g	97%
AAU0315A	756525-99-2	Mal-amido-PEG4-NHS ester	100mg	200mg	98%
AAU0316A	139338-72-0	Fmoc-amino-PEG3-CH2COOH	2g	4g	97%
AAU0317A	252881-76-8	Biotin-PEG3-acid	1g	2g	95%
AAU0318A	1381861-91-1	Bromo-PEG2-C2-Boc	1g	2g	97%
AAU0319A	1292268-13-3	N-Boc-PEG7-alcohol	5g	10g	97%
AAU0320A	1334286-77-9	Hydroxy-PEG2-acid	250mg	500mg	97%
AAU0321A	1036204-60-0	Propargyl-PEG5-OH	250mg	500mg	95%
AAU0322A	2250216-93-2	Boc-NH-PEG3-NHS ester	1g	2g	97%
AAU0323A	1314378-14-7	Fmoc-PEG4-NHS ester	1g	2g	98%
AAU0324A	1431618-70-0	Biotin-PEG3-Mal	100mg	200mg	97%
AAU0325A	912849-73-1	Azido-PEG10-amine	1g	2g	97%
AAU0326A	157759-50-7	Bromo-PEG1-CH2-Boc	1g	2g	97%
AAU0327A	134179-38-7	Amino-PEG3-C2-Azido	100mg	200mg	97%
AAU0328A	778596-26-2	Hydroxy-PEG10-Boc	1g	2g	97%
AAU0329A	57641-67-5	Br-PEG3-OH	250mg	500mg	98%
AAU0330A	189808-70-6	NH2-PEG3-C1-Boc	1g	2g	98%
AAU0331A	7218-43-1	Propargyl-PEG2-OH	250mg	500mg	95%
AAU0332A	1056024-94-2	N3-PEG3-CH2CH2COOH	5g	10g	98%
AAU0333A	359860-27-8	Amine-PEG3-Biotin	100mg	200mg	97%
AAU0334A	1537892-36-6	Mal-PEG3-NHS ester	500mg	1g	98%
AAU0335A	1260092-44-1	Boc-NH-PEG1-CH2CH2COOH	5g	10g	97%
AAU0336A	85141-94-2	Br-PEG4-OH	1g	2g	97%
AAU0337A	352439-37-3	NH2-PEG8-OH	1g	2g	97%

AAU0338A	141282-35-1	Amino-PEG5-CH2COOH	0.1g	0.2g	98%
AAU0339A	635287-26-2	Fmoc-NH-PEG5-CH2COOH	0.25g	0.5g	97%
AAU0340A	867062-95-1	Fmoc-NH-PEG3-CH2CH2COOH	100mg	200mg	98%
AAU0341A	1052207-59-6	Boc-NH-PEG8-CH2CH2NH2	1g	2g	98%
AAU0342A	31255-26-2	Bromo-PEG3-bromide	1g	2g	98%
AAU0343A	24345-74-2	Azido-PEG1-azide	100mg	200mg	98%
AAU0344A	1325208-25-0	Mal-PEG4-NHS ester	250mg	500mg	97%
AAU0345A	516493-93-9	Azido-PEG5-amine	1g	2g	97%
AAU0346A	1374666-32-6	Mal-PEG2-acid	100mg	200mg	97%
AAU0347A	1013921-36-2	Propargyl-PEG4-amine	250mg	500mg	97%
AAU0348A	1347750-75-7	Boc-N-amido-PEG3-acid	1g	2g	97%
AAU0349A	72236-26-1	Amino-PEG5-amine	0.25g	0.5g	97%
AAU0350A	332941-25-0	Amino-PEG7-amine	0.25g	0.5g	98%
AAU0351A	1517-05-1	Azido-PEG1	5g	10g	97%
AAU0352A	945633-30-7	Biotin-PEG2-CH2CH2N3	50mg	100mg	97%
AAU0353A	65869-63-8	Bis-PEG2-NHS ester	100mg	200mg	97%
AAU0354A	206265-98-7	Boc-NH-PEG7-NH2	100mg	200mg	97%
AAU0355A	721431-18-1	Biotin-PEG4-acid	50mg	100mg	97%
AAU0356A	1027371-75-0	m-PEG1-NHS ester	1g	2g	97%
AAU0357A	110429-45-3	m-PEG4-Br	5g	10g	97%
AAU0358A	782475-37-0	Br-PEG3-C2-Boc	1g	2g	97%
AAU0359A	784105-33-5	Amino-PEG3-C2-acid	1g	2g	97%
AAU0360A	530151-56-5	Bromo-PEG2-C2-azide	1g	2g	97%
AAU0361A	905954-28-1	NH2-PEG6-CH2CH2COOH	1g	2g	97%
AAU0362A	195071-49-9	Amino-PEG4-CH2COOH	2g	4g	97%
AAU0363A	2365309-92-6	Cl-PEG6-acid	100mg	200mg	98%
AAU0364A	1137109-21-7	Mal-amido-PEG6-NHS ester	100g	200g	97%
AAU0365A	936917-36-1	Iodo-PEG4-N3	500mg	1g	97%
AAU0366A	85030-56-4	m-PEG4-Amine	250mg	500mg	97%
AAU0367A	869718-81-0	m-PEG8-Amine	1g	2g	97%
AAU0368A	1702356-19-1	ENdo-BCN-PEG4-NHS ester	25mg	50mg	97%
AAU0369A	1058691-77-2	m-PEG6-CH2CH2CHO	100mg	200mg	97%

Seebio 供应 G-Kg 级别蛋白药物中间体

蛋白药物中间体	Seebio Code	CAS No.	Name	Packsize
生长激素侧链	AAU0178A	No.	TZ-Ste-SO2-nBu-AEEA-Glu(OH)-Glu(OH)-AEEA-Lys(OH)-C	1g, 5g; 1kg
	AAU0179A	No.	HO-Ste-CYH-Glu(OH)-Glu(OH)-AEEEEA-Mal	1g, 5g; 1kg
Tirzepatide 侧链	AAU0180A	1188328-37-1	OtBu-Ara-Glu(AEEA-AEEA-OH)-OtBu	1g, 5g; 1kg
索马鲁肽侧链	AAU0181A	1169630-40-3	(S)-22-(羧基)-1-((2,5-二氧化环戊基)氧基)-1,10,19,24-	1g, 5g; 1kg

			四氧代-3,6,12,15-四氧杂-9,18,23-氮杂四十一烷-41-酸	
	AAU0182A	1118767-16-0	tBuO-Ste-Glu(AEEA-AEEA-OH)-OtBu	1g, 5g; 1kg
	AAU0183A	1118767-15-9	tBuO-Ste-Glu(AEEA-AEEA-OSu)-OtBu	1g, 5g; 1kg
	AAU0184A	No.	tBuO-Ste-Glu(AEEA-AEEA-ONa)-OtBu	1g, 5g; 1kg
	AAU0185A	4871-70-5	十八烷二酸	1g, 5g; 1kg
	AAU0186A	843666-40-0	十八烷二酸单叔丁酯	1g, 5g; 1kg
	AAU0187A	134978-97-5	AEEA	1g, 5g; 1kg
	AAU0188A	1143516-05-5	AEEA-AEEA	1g, 5g; 1kg
	AAU0189A	166108-71-0	Fmoc-AEEA	1g, 5g; 1kg
	AAU0190A	No.	Fmoc-PEG3-乙酸	1g, 5g; 1kg
	AAU0191A	2061897-68-3	Boc-His(Trt)-Aib-OH	1g, 5g; 1kg
	AAU0192A	No.	Boc-His(Trt)-Aib-Glu(OtBu)-Gly-OH	1g, 5g; 1kg
	AAU0193A	1662688-20-1	Fmoc-Lys(tBuO-Ste-Glu(AEEA-AEEA)-OtBu)-OH	1g, 5g; 1kg
	AAU0194A	No.	tBuO-Ste-Glu(AEEA-AEEA-Glu)-OtBu	1g, 5g; 1kg
利拉鲁肽侧链	AAU0195A	204521-63-1	Pal-Glu(OSu)-OtBu	1g, 5g; 1kg
	AAU0196A	57078-98-5	D-Pal-Glu(OSu)-OtBu	1g, 5g; 1kg
	AAU0197A	No.	L-HO-Pal-Lys(OSu)-OH	1g, 5g; 1kg
	AAU0198A	294855-91-7	L-Pal-Glu(OSu)-OH	1g, 5g; 1kg
	AAU0199A	No.	L-Pal-Glu(OH)-OtBu	1g, 5g; 1kg
	AAU0200A	No.	2L-HO-Pal-Glu(OSu)-OtBu	1g, 5g; 1kg
德谷胰岛素侧链	AAU0201A	No.	L-HO-Pal-Glu(OSu)-OH	1g, 5g; 1kg
	AAU0202A	No.	L-tBuO-Pal-Glu(OSu)-OtBu	1g, 5g; 1kg
	AAU0203A	No.	L-tBuO-Pal-Glu(OSu)-OH	1g, 5g; 1kg
地特胰岛素侧链	AAU0204A	69888-86-4	N-琥珀酰亚胺基豆蔻酸	1g, 5g; 1kg

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