

1. TOYOPEARL APPLICATION IN LOW MW COMPOUNDS

/ TOYOPEARL在低分子化合物中的应用

Target Molecule	Toyopearl	Comment
Inorganic Ion / 无机离子		
Li ⁺ , Na ⁺ / 锂、钠离子	HW-40F	
Platinum group metal / 铂类金属	HW-40C	patent
Zn complex / 锌复合物	HW-40F	

Low MW Compound / 低分子化合物		
Detergent / 去垢剂	HW-40F	Methanol
alkylporphyrin / 烷基卟啉	HW-40	
Detergent / 去垢剂	Butyl-650	30 L scale
Detergent / 去垢剂	Butyl-400	Special grade
Pyrroro-quinoline quinone / 吡咯喹啉苯醌	HW-40S	patent

Active Low MW Compounds / 活性低分子化合物		
Acakypidins	HW-40	
Anthocyanin / 花青素	HW-40F	
Anthraquinone / 蒽醌	DEAE-650C	patent
Black vinegar	HW-50F	Water
Catechin / 儿茶酚	HW-40	
Chestanin	HW-40F	50 % methanol
Digoxin / 异羟洋地黄毒苷, 地高辛		50% methanol
Epigallocatechin	HW-40	
Flavan / 黄烷	HW-40C	
Flavonoid glycoside / 类黄酮配糖类	HW-40	
Galloylarbutin	HW-40F	
Isoflavonoid / 异黄酮	HW-40	Methanol:water = 70:30
Ouabain / 乌本 (箭毒) 苷		50% methanol
plant growth hormone / 植物生长激素	HW-40	
Polyphenol / 多酚	HW-40C, EC	
Proanthocyanidin oligomer / 花色苷低聚物	HW-40F	patent
Procyanidine	HW-40S, F	
Tannin / 丹宁酸	HW-40	
Theaflavin	HW-40	patent

Active Pharmaceutical Ingredient (API), Traditional Chinese Medicine (TCM)		
活性药物成分 (API), 中药 (TCM)		
Aliphatic acid amide / 脂肪族酰胺	HW-40C	
Anti-complementary acidic heteroglycan	DEAE-650C	
Antidiabetic compound / 抗糖尿病化合物	HW-55	patent
Antiemetic agent / 止吐剂	CM-650M	patent
Antifungal compound / 抗真菌化合物	HW-40	patent
Antifungal compound (Azoxy compound)	HW-40	patent
Anti-oxidant phenolic compounds / 抗氧化酚类化合物	HW-40F	

Target Molecule	Toyopearl	Comment
Active Pharmaceutical Ingredient (API), Traditional Chinese Medicine (TCM)		
活性药物成分 (API), 中药 (TCM)		
Antitumor substance / 抗癌化合物	HW-40F	patent
Astragaline	HW-40C	
Carcinogen promotion inhibitor/ 致癌物质抑制促进剂	HW-40C	patent
Extract from pine needle / 松针抽提物	HW-40	
Ginseng fraction / 人参,高丽参组分	HW-55F, DEAE-650	
Hair growth stimulant / 头发生长刺激物	HW-40F	patent
Limonoid	HW-40	
Nematode-antagonistic compound	HW-40	
Oxacillin / 苯甲异噁唑青霉素 (新青二)	HW-40C	methanol/water, step gradient
Phenylethanoid glycoside	HW-40	
Taxifolin apioside	HW-40F	

Antibiotics / 抗生素		
##STR5##	HW-40	patent
Actinomycin / 放射菌素	HW-40C	Hexan: Ethylacetate:Acetic acid:Methanol:Water = 100:30:20:20:4
Anthracycline /	HW-40	patent
Antibiotics / 抗生素	CM-650C	300 L scale
Chloropolysporin C /	HW-40F	patent
Cirratomycin A /	HW-40F	Water
DO-248-A, B	HW-50C	patent
Mureidomycin A-D /	HW-40	
Trieinomycin /	HW-40, DEAE-650	patent

Food Additives / 食品添加剂		
Yellow pigment / 黄色素	HW-40F	patent
Riboflavin monoglucoside / 核黄素配糖物单体	HW-40F	patent

Synthetic Polymer / 合成树脂		
Polyethylene glycol / 聚乙二醇	HW-40S	water
Polyethylene glycol / 聚乙二醇	Butyl-650M	patent

2. TOYOPEARL APPLICATION IN AMINO, PEPTIDE, PROTEIN AND VACCINE / TOYOPEARL在氨基酸, 多肽, 蛋白质及疫苗中的应用

Target Molecule	Toyopearl	Comment
Amino Acid / 氨基酸		
hydroxy proline / 羟基脯氨酸	DEAE-650S	patent

Peptide / 多肽		
Aprotinin / 胰蛋白酶抑制剂 (抑肽酶)	HW-55F	3 M guanidine-HCl + 2.4 M formic acid
Insulin / 胰岛素	SP-550C, MegaCap II SP-550EC	
Insulin / 胰岛素	Ether-5PW, Phenyl-5PW (650)	
Lactoferricin / 乳铁传递肽	CM-650M, Butyl-650M	patent
Parathyroid hormone / 甲状旁腺 (激) 素	CM-650S	patent
Peptide / 多肽	CM-650M	500 L scale
Peptide digest / 多肽水解物	HW-40F	0.2 M carbonate buffer (pH
Peptides (3 types) / 多肽 (3种)	SP-650	10 L scale
r-Insulin / r胰岛素	DEAE-650M	1230 L scale
Sardines hydrolysate / 沙丁鱼水解产物	HW-40	0.2 M ammonium acetate (pH 5)

Growth Factor / 生长因子		
Epidermal growth factor (GF) / 表皮生长因子	Phenyl-5PW	
Epidermal growth factor (GF) / 表皮生长因子	SP-650M	patent
EPO binding protein /	Phenyl-650	patent
Erythropoietin (EPO) / (促) 红细胞生成素	Butyl-650C, AF-Blue HC 650M	60 L and 30 L scale, respectively
Erythropoietin (EPO) / (促) 红细胞生成素	Butyl-650S	patent
G-CSF conjugate / 粒细胞集落刺激因子	DEAE-650M, Butyl-650M	patent
Growth Factor / 生长因子	HW-55F	
Growth factor-7 / 生长因子	Butyl-650	patent
human growth hormone / 人生长激素	Phenyl-650M	
r-human growth hormone (GH) / r人生长激素	Butyl-650, Phenyl-5PW	
Interleukin-10 / 白细胞介素-10	Butyl-650M	patent
Interleukin-6 / 白细胞介素-6	Butyl-650M, AF-Heparin HC-650M	patent
Insulin-like growth factor / 类胰岛素生长因子	SP-550C, Butyl-650M, Phenyl-650	patent
Interferon (feline) / 干扰素 (猫科动物)	AF-Red 650M	patent
Interferon Alpha / α 干扰素	Butyl-650	patent
Interferon Alpha / α 干扰素	Phenyl-650S	patent
Interferon Alpha / α 干扰素	CM-650M, Butyl-650M	patent
Interferon Beta / β 干扰素	Butyl-650	50 L scale
Interferon Epsilon / ϵ 干扰素	Butyl-65-	patent
Interferon PEGylated / PEG化干扰素	Phenyl-650M	patent
Interleukin-2 / 白细胞介素-2	Phenyl-5PW, Ether-5PW	
Interleukin-8 / 白细胞介素-8	HW-55	

Target Molecule	Toyopearl	Comment
Growth Factor / 生长因子		
M-CSF 223 protein / M-CSF 223 蛋白	Phenyl-650	patent
Neutrophins /	Phenyl-650M	patent
TGF Beta-family /	Butyl-650	patent
Tumor Necrosis Factor (TNF) / 肿瘤坏死因子	HW-55F	patent

Other proteins / 其他蛋白质		
Allergen (mite) / 变态反应原 (螨类)	DEAE-650, Butyl-650	patent
Antibody (monoclonal) / 抗体 (单抗)	Phenyl-650M, Butyl-650M	patent
Beta-Galactosidase / β 牛乳糖	SP-650	50 L
Carboxyl peptidase / 羧基肽酶	Butyl-650	patent
Dihydrofolate reductase / 二氢叶酸还原酶	DEAE-650, Butyl-650	patent
Elastase inhibitor / 弹性蛋白酶阻断剂	DEAE-650, AF-Red 650M, HW-55	8 L, 5 L, and 5 L scale
Fc-fusion protein /	Phenyl-650C	
Haemoglobin / 血色素、血红蛋白	AF-Chelate 650M	patent
HCV serine-proteinase / HCV丝氨酸蛋白酶	Methotrexate-AF-Tresyl-650M	patent
Hirudin / 水蛭素	Butyl-650	patent
Histidinol dehydrogenase / 组氨酸醇脱氢酶	DEAE-650	patent
Lactoferrin / 乳铁传递蛋白	CM-650	patent
Proteinase K, Aminopeptidase K / 蛋白酶K、氨基肽酶K	CM-650	40 L scale
Removal of virus from biopharmaceuticals / 生物制药中病毒的除去	Butyl-650, Phenyl-650	patent
Sphingomyelinase /	Butyl-650, DEAE-5PW, Phenyl-5PW	patent
Superoxide Dismutase (SOD) / 过氧化物歧化酶	Butyl-650M	patent
Urease / 脲酶、尿素酶	HW-65	15 L scale
Urease / 脲酶、尿素酶	Butyl-650C, DEAE-650S	patent

Vaccine / 疫苗		
Hepatitis B Vaccine / 乙肝疫苗	DEAE-650	50 L scale
Hepatitis A Virus Vaccine / 甲肝疫苗	DEAE-650M, HW-55S, HW-65S	patent
Malaria immunogen and vaccine / 疟疾免疫原和疫苗	Butyl-650, Ether-650	patent
Adenovirus / 腺病毒	SuperQ-650, G6000PW	patent
Adenovirus / 腺病毒	HW-40C	patent
Retroviral vector /	SuperQ-650	patent

3. TOYOPEARL APPLICATION IN PLASMA PROTEIN

/ TOYOPEARL 在血浆蛋白质中的应用

Target Molecule	Toyopearl	Comment
Plasma Protein / 血浆蛋白		
Albumin / 血清（白）蛋白	DEAE-650, QAE-550C, SuperQ-650M	
Albumin / 血清（白）蛋白	QAE-550C, SP-650	patent
Albumin / 血清（白）蛋白	HW-50F	
Albumin / 血清（白）蛋白	Phenyl-650, Butyl-650M, SuperButyl-550C	
Alpha 1 acid glycoprotein / α 1酸性糖蛋白	SuperQ-650	patent
Alpha 1 antitrypsin / α 1抗胰蛋白酶	SuperQ-650	patent
Antibody / 抗体	GigaCap S	
Antibody / 抗体	PPG-600M, Butyl-600M, Phenyl-650M	
Antibody / 抗体	DEAE-5PW	10 L
Antibody / 抗体	SP-650C, Butyl-650	25 L and 60 L, respectively
Antibody / 抗体	SP-650, Butyl-650	30 L and 10 L scale, respectively
Antithrombin III / 凝血酶 III	AF-Heparin HC 650M	
Antithrombin III / 凝血酶 III	AF-Chelate 650M, Butyl-650	patent
Antitumor factor / 抗癌因子	DEAE-650	patent
Enzyme / 酶	Affinity HW-65F	1000 L scale
Factor IX / 九因子	DEAE-650M	
Factor IX / 九因子	QAE-550C, DEAE-650, SP-650	patent
Factor VII / 七因子	DEAE-650, SuperQ-650, Butyl-650, Phenyl-650	patent
Factor VIII / 八因子	DEAE-650M, AF-Heparin HC	
Factor VIII/vWF / 八因子/vWF	DEAE-650M	200 L scale
Factor VIII/vWF / 八因子/vWF	AF-Heparin HC 650M	patent
Factor VIII/vWF / 八因子/vWF	SP-550C, CM-650	patent
Factor XIII / 十三因子	Butyl-650	patent
IgA / 免疫球蛋白A	DEAE-650	patent
Name not disclosed / 未公开	QAE-550C	500 L scale
Name not disclosed / 未公开	Butyl-650M	200 L scale
r human albumin / r人血清白蛋白	HW-50F	patent
r human albumin / r人血清白蛋白	DEAE-650M, Butyl-650	
r human albumin / r人血清白蛋白	DEAE-650, SuperQ-650, Butyl-650, Phenyl-650	patent
Thrombin / 凝血酶	AF-Heparin HC 650M	patent
Tissue plasminogen activator (rPA) / 组织血浆酶原激活剂	DEAE-650, Butyl-650	50 L and 20 L scale, respectively

4. TOYOPEARL APPLICATION IN SACCHARIDES / TOYOPEARL 在多糖物质中的应用

Target Molecule	Toyopearl	Comment
Saccharides / 多糖		
acidic cyclodextrin / 酸性环式糊精	SP-650C, HW-40F	patent
acidic oligosaccharide / 酸性寡（低聚）糖	DEAE-650M	1-100 mM KCl gradient
Anti-hepatitis polysaccharide / 抗肝炎多糖	DEAE-650C	patent
Branched fructooligosaccharide / 分岔的果聚糖	HW-40S	patent
Carcinogen promoting inhibitor / 促致癌物质抑制剂	HW-65F	patent
Gonaderan A	DEAE-650	patent
Lithosperman A	DEAE-650	patent
Maltopentoside / 麦芽戊糖苷	HW-40S	Water
polysaccharide / 多糖	HW-65F	0.1 M NaCl
Starch / 淀粉	HW-75F	
TX-1 polysaccharide / TX-1多糖	HW-65F	patent

5. TOYOPEARL APPLICATION IN NUCLEIC ACID

/ TOYOPEARL 在核酸物质中的应用

Target Molecule	Toyopearl	Comment
Nucleic Acid / 核酸		
Mononucleotide / 单核苷酸	DEAE-650S	0.05-0.5 M NaCl gradient
mRNA / 信使核糖核酸	HW-65F	0.02 M Na-citrate, 5 mM EDTA, 0.5 % SDS, 6 M Urea
Oligonucleotide / 寡（低聚）核苷酸	DEAE-650S	0.2-0.8 M ammonium formate gradient in 20 % acetonitrile
Plasmid / 质粒、质体	HW-75S	
Plasmid / 质粒、质体	Butyl-650, Hexyl-650C	patent