



# Peptide purification

DuPont offers different types of adsorbent media characterized by their particle size distribution, surface area, porosity, hydrophobicity and stability to a wide variety of conditions:

- Acids/Caustic – pH range of 1–14
- Organic Solvents
- Peracetic acid, weak oxidizer
- Steam sterilization

These products are stable to cleaning in place procedures with caustic and are a valid alternative to silica chromatographic products.

## Insulin

Insulin mainly treats type I diabetes, diabetes mellitus of pregnant women and diabetic ketoacidosis. More than 450 million people have diabetes, causing 1.7 million deaths per year. Insulin used in therapeutics was initially extracted from porcine or bovine pancreas. Insulin derived from animals was later replaced by human-derived insulin, either by the transformation of pig insulin by chemical and enzymatic processing, or by bacterial synthesis by recombinant DNA techniques. Now, one distinguishes human insulins and their analogues (such as insulin lispro, insulin aspart, insulin glargine) by differences in certain amino acids and kinetics of action.

The benefit in having pure human insulin is to decrease the risk of antibody formation. Nowadays, insulin is predominantly manufactured using recombinant DNA technology in yeast (*Saccharomyces cerevisiae*) or in bacteria (*Escherichia Coli*) expression systems. After harvesting of the pro-insulin, clarification of the

fermentation broth, refolding and enzymatic cleavage, **DuPont™ AmberChrom™ CG300M** and **AmberChrom™ XT30** or **AmberChrom™ XT20** can be used in Reverse Phase Chromatography to separate the insulin from various impurities including analogs like A21 desamido-insulin.



## Glucagon Like Peptide (GLP-1)

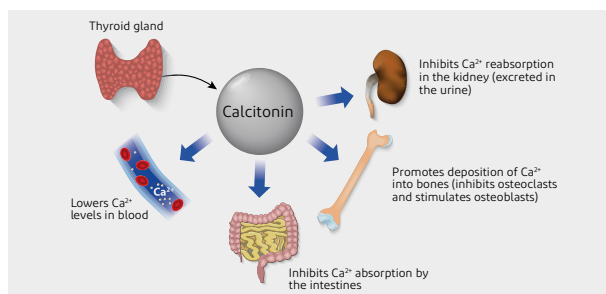
Glucagon Like Peptide (GLP-1) can be used in treatments of diabetes type 2, where carbohydrates are not metabolized due to insulin resistance or lack of insulin, resulting in high level of glucose in the blood. Glucagon-like peptide-1 (GLP-1) is a 30 amino acid long peptide with the ability to decrease blood sugar levels in a glucose-dependent manner by enhancing the

secretion of insulin. GLP-1 is regarded as a desirable medicine to treat diabetes mellitus. **DuPont™ AmberLite™ XAD™ 1600N**, a polymeric divinylbenzene adsorbent and **AmberChrom™ CG71M**, an insoluble aliphatic acrylic ester macroreticular adsorbent with enhanced hydrophilic properties, are particularly suitable for the purification step.

## Calcitonin

Calcitonin is a hormone that is produced in humans by the parafollicular cells (commonly known as C-cells) of the thyroid gland. Calcitonin is involved in helping to regulate levels of calcium and phosphate in the blood, opposing the action of parathyroid hormone. Calcitonin is a 32-amino acid linear

polypeptide. It mitigates bone resorption by inhibition of osteoclasts. Current indications are for osteoporosis and osteoarthritis. Calcitonin is produced either by using recombinant DNA technology or through chemical peptide synthesis. **AmberChrom™ XT30** is suitable for the purification step.



Biomolecule	Application	Process steps	Resin
Insulin	Type I diabetes	Reverse Phase Chromatography purification	AmberChrom™ CG300M
GLP-1	Type II diabetes	Extraction and Reverse Phase Chromatography purification	AmberLite™ XAD™ 1600N AmberChrom™ CG71M
Orivatancin	Gram-positive bacterial infections	Reverse Phase Chromatography purification	AmberChrom™ CG161M
Albuvirtide	Long acting HIV-1 fusion inhibitor	Reverse Phase Chromatography purification	AmberChrom™ CG300M AmberChrom™ XT20
Enfuvirtide	HIV-1 fusion inhibitor	Concentration	AmberChrom™ CG300M
Calcitonin	Osteoporosis	Reverse Phase Chromatography purification	AmberChrom™ XT30
Glutathione	Antioxidant	Extraction and Reverse Phase Chromatography purification	AmberLite™ FPC14Na AmberChrom™ XAD™ 1600N
Gonadotropin	Treatment of infertility	Reverse Phase Chromatography	AmberChrom™ CG71M
Nisin	Food preservative	Reverse Phase Chromatography purification	AmberChrom™ CG300M



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