

Is PEGylation of drugs associated with hypersensitivity reactions? An analysis of the Italian National Spontaneous Adverse Drug Reaction Reporting System

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Appendix Table 1. PEGylated and non-PEGylated medicinal products included in the analyses

PEG	PEG size (kDa)	Active Substance	Indications of use	Brand name	Administration route
+	20	Pegfilgrastim	Reduction of neutropenia in patients treated with cytotoxic chemotherapy for malignancy	Neulasta, Pelmeg, Cegfila, Fulphila, Pelgraz, Grasustek, Ziextenzo, Udenyca, Nyvepria	Subcutaneous
		Lipegfilgrastim		Lonquex	Subcutaneous
-	NA	Filgrastim	Reduction of neutropenia in patients treated with cytotoxic chemotherapy for malignancy	Filgrastim Hexal, Tevagrastim, Nivestim, Ratiograstim, Grastofil, Accofil, Zarzio, Granulokine	Subcutaneous
+	30	Methoxy-PEG epoetin beta	Symptomatic anaemia associated with chronic kidney disease	Mircera	Subcutaneous or intravenous
-	NA	Epoetin alpha	Symptomatic anaemia associated with chronic renal failure	Epoetin Alpha Hexal, Binocrit, Abseamed, Eprex/Erypo	Subcutaneous or intravenous
		Darbepoetin alpha	Symptomatic anaemia associated with chronic renal failure or chemotherapy	Aranesp	Subcutaneous or intravenous
		Epoetin beta	Symptomatic anaemia associated with chronic renal failure or chemotherapy	NeoRecormon	Subcutaneous or intravenous
+	5	Pegaspargase	Acute lymphoblastic leukaemia	Oncaspar	Intramuscular or intravenous
-	NA	Asparaginase	Acute lymphoblastic leukaemia	Spectrila	Intravenous
+	20	Peginterferon beta-1a	Relapsing remitting multiple sclerosis	Plegridy	Intramuscular or subcutaneous
-	NA	Interferon beta-1a	Relapsing multiple sclerosis	Rebif, Avonex	Subcutaneous

PEG	PEG size (kDa)	Active Substance	Indications of use	Brand name	Administration route
		Recombinant inteferon beta-1b	Relapsing-remitting multiple sclerosis or secondary progressive multiple sclerosis	Betaferon, Extavia	Subcutaneous
+	12	Peginterferon alpha-2b	Chronic hepatitis C	Pegintron	Subcutaneous
-	NA	Interferon alpha-2b	Chronic hepatitis B and C	IntronA	Subcutaneous or intravenous
+	40	Peginterferon alpha-2a	Chronic hepatitis B and C	Pegasys	Subcutaneous
-	NA	Interferon alpha-2a	Hairy cell leukemia, Kaposi's sarcoma, chronic myelogenous leukemia, cutaneous T-cell lymphoma, chronic hepatitis B, chronic hepatitis C	Roferon-A, Alpheon	Subcutaneous
+	40	Nonacog beta pegol	Treatment and prophylaxis of bleeding in patients ≥ 12 years with haemophilia B	Rebinyon/ Refixia	Intravenous
-	NA	Nonacog alpha	Treatment and prophylaxis of bleeding in patients with haemophilia B	BeneFIX	Intravenous
		Nonacog gamma		Rixubis	Intravenous
		Eftrenonacog alpha		Alprolix	Intravenous
		Trenonacog alpha		IXinity	Intravenous
+	40	Certolizumab pegol	Rheumatoid arthritis, axial spondyloarthritis, psoriatic arthritis, plaque psoriasis	Cimzia	Subcutaneous
-	NA	Adalimumab	Juvenile idiopathic arthritis, psoriasis, plaque psoriasis, Crohn's disease, ulcerative colitis, uveitis, hidradenitis suppurativa, psoriatic arthritis	Humira	Subcutaneous
		Golimumab	Juvenile idiopathic arthritis, rheumatoid arthritis, psoriatic	Simponi	Subcutaneous

PEG	PEG size (kDa)	Active Substance	Indications of use	Brand name	Administration route
			arthritis, axial spondyloarthritis, ulcerative colitis		
		Etanercept	Rheumatoid arthritis, juvenile idiopathic arthritis, psoriatic arthritis, axial spondyloarthritis, plaque psoriasis	Enbrel	Subcutaneous
+	5	Pegvisomant	Acromegaly	Somavert	Subcutaneous
-	NA	Somatropin	Growth disturbance due to insufficient secretion of growth hormone, or associated with Turner syndrome or chronic renal insufficiency	Saizen, NutropinAq, Norditropin NordiFlex, Zomacton, Humatrope, Omnitrope, Genotropin	Subcutaneous
+	2	Doxorubicin PEGylated liposomal	Metastatic breast cancer, advanced ovarian cancer, progressive multiple myeloma, AIDS-related Kaposi's sarcoma	Caelyx PEGylated liposomal	Intravenous
-	NA	Doxorubicin liposomal	Metastatic breast cancer	Myocet liposomal	Intravenous
+	2	Irinotecan PEGylated liposomal	Metastatic adenocarcinoma of the pancreas	Onivyde	Intravenous
-	NA	Irinotecan	Advanced colorectal cancer	Campto	Intravenous