

WHO International Biological Reference Preparations

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BLOOD PRODUCTS AND RELATED SUBSTANCES

PREPARATION	STANDARD	WHO TRS ECBS REPORT	MATERIAL	HELD AT	CODE	WHO/BS DOCUMENTS
● Alphafetoprotein, human. Lyophilized. 100,000 IU / ampoule.	1st International Standard, 1975	No. 594, 27th Report	Human cord serum	NIBSC	AFP	75.1121
● Ancrod. Lyophilized. 55 IU / ampoule.	1st International Reference Preparation, 1976	No. 626, 29th Report	Enzyme	NIBSC	74/581	76.1130
● Anti-A Blood Grouping minimum potency reagent. Lyophilized. No assigned activity. However a 1 in 8 dilution should define the recommended minimum potency specification for anti-A blood grouping reagents.	1st International Standard, 2005	To be published	Blood grouping serum	NIBSC	03/188	05-2024
● Anti-A blood typing serum, human. Lyophilized. 470 IU / ampoule.	2nd International Standard, 1981	No. 673, 32nd Report	Human serum	Sanquin	W1001	81.1309
● Anti-B Blood Grouping minimum potency reagent. Lyophilized. No assigned activity. However a 1 in 4 dilution should define the recommended minimum potency specification for anti-B blood grouping reagents	1st International Standard, 2005	To be published	Blood grouping serum	NIBSC	03/164	05.2024
● Anti-B blood-typing serum, human. Lyophilized. 860 IU / ampoule.	3rd International Standard, 1981	No. 673, 32nd Report	Human serum	Sanquin	W1002	81.1309
● Anti-C complete blood-typing serum, human. Lyophilized. 100 IU / ampoule.	1st International Standard, 1984	No. 725, 35th Report	Human serum	Sanquin	W1004	84.1424
● Anti-c incomplete blood-typing serum, human. Lyophilized. 64 IU / ampoule.	1st International Standard, 1976	No. 610, 28th Report	Human serum	Sanquin	W1007	71.1038

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Anti-D (anti-Rh0) blood-grouping reagent, complete. Lyophilized. 1 in 3 dilution recommended	1st International Minimum Potency Standard, 2004	In press	Monoclonal IgM (human)	NIBSC	99/836	04.2000 Rev. 1
Anti-D (anti-Rh0) incomplete blood-typing serum, human. Lyophilized. 32 IU / ampoule.	1st International Standard, 1966	No. 361, 19th Report	Human serum	Sanquin	W1006	66.810
Anti-D immunoglobulin, human. Lyophilized. 285 IU (57 µg) / ampoule.	2nd International Standard, 2003	No. 926, 53rd Report	Human immunoglobulin	NIBSC	01/572	03.1962
Anti-double-stranded DNA serum, human. Lyophilized. 100 IU / ampoule.	1st International Standard, 1985	No. 745, 36th Report	Human serum	Sanquin	Wo/80 (W1065)	85.1491
Anti-E complete blood-typing serum, human. Lyophilized. 100 IU / ampoule.	1st International Standard, 1983	No. 700, 34th Report	Human serum	Sanquin	W1005	83.1424
Anti-echinococcus serum, human. Lyophilized. 87.36 mg human serum / ampoule.	1st International Reference Reagent, 1975	No. 594, 27th Report	Human serum	NIBSC	ECHS	75.1106
Anti-hepatitis A immunoglobulin, human. Lyophilized. 49 IU / ampoule.	2nd International Standard, 1998	No. 897, 49th Report	Human immunoglobulin	Sanquin NIBSC	W1041 97/646	98.1878
Anti-hepatitis B immunoglobulin, human. Lyophilized. 50 IU / ampoule.	1st International Reference Preparation, 1977	No. 626, 29th Report	Human immunoglobulin	Sanquin	W1042	77.1164
Anti-hepatitis E serum, human. Lyophilized. 50 units / ampoule.	1st Reference Reagent, 1997	No. 889, 48th Report	Human serum	NIBSC	95/584	97.1869

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● Anti-human platelet antigen-1a. Lyophilized. No unitage assigned.	1st Reference Reagent, 1997	No. 889, 48th Report	Human serum	NIBSC	93/710	97.1862
● Anti-human platelet antigen-5b. Lyophilized. No assigned unitage	1st Reference Reagent, 2003	No. 926, 53rd Report	Human serum	NIBSC	99/666	Verbal
● Anti-interferon alpha serum, human. Lyophilized. 8,000 neutralising units / ampoule.	1st International Reference Reagent, 1994	No. 858, 45th Report	Human serum	NIAID	G037-501-572	94.1783
● Anti-interferon beta serum, human. Lyophilized. 1,500 neutralising units / ampoule.	1st International Reference Reagent, 1994	No. 858, 45th Report	Human serum	NIAID	G038-501-572	94.1783
● Anti-measles serum, human. Lyophilized. 5 IU / ampoule.	2nd International Standard, 1990	No. 814, 41st Report	Human serum	NIBSC	66/202	90.1636
● Anti-nuclear ribonucleoprotein serum. Lyophilized. No unitage assigned.	1st International Reference Reagent, 1983	No.700, 34th Report	Human serum	Sanquin	W1063	83.1390
● Anti-nuclear-factor (homogeneous) serum. Lyophilized. 100 IU / ampoule.	1st International Reference Preparation, 1970	No. 463, 23rd Report	Human serum	Sanquin	66/233 (W1064)	70.1005
● Anti-parvovirus B19 (IgG) serum. Lyophilized. 77 IU / ampoule.	2nd International Standard, 2003	No. 926, 53rd Report:	Human serum	NIBSC	01/602	03.1960
● Anti-poliovirus serum (Types 1, 2, 3). Lyophilized. 25 IU / ampoule (Type 1), 50 IU / ampoule (Type 2), 5 IU / ampoule (Type 3).	2nd International Standard, 1991	No. 822, 42nd Report	Human serum	NIBSC	66/202	91.1660

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PREPARATION	STANDARD	WHO TRS ECBS REPORT	MATERIAL	HELD AT	CODE	WHO/BS DOCUMENTS
● Anti-rabies immunoglobulin, human. Lyophilized. 30 IU / ampoule.	2nd International Standard, 1993	No. 848, 44th Report	Human immunoglobulin	NIBSC	RAI	93.1749
● Anti-rubella immunoglobulin, human. Lyophilized. 1,600 IU / vial.	1st International Standard, 1996	No. 878, 47th Report	Human immunoglobulin	NIBSC	RUBI-1-94	96.1833
● Anti-smooth muscle serum. Lyophilized. No unitage assigned.	1st International Reference Reagent, 1983	No. 700, 34th Report	Human serum	Sanquin	W1062	83.1390
● Anti-syphilitic serum, human. Lyophilized. 49 IU / ampoule.	1st International Standard, 1958	No. 172, 12th Report	Human serum	NIBSC	HS	58.439
● Anti-tetanus immunoglobulin, human. Lyophilized. 120 IU / ampoule.	1st International Standard, 1992	No. 840, 43rd Report	Human immunoglobulin	NIBSC	TE-3	92.1696
● Antithrombin, concentrate, human. Lyophilized. Functional potency - 4.7 IU / ampoule. Antigenic potency - 5.1 IU / ampoule.	2nd International Standard, 1997	No. 889, 48th Report	Purified plasma protein	NIBSC	96/520	97.1863
● Antithrombin, plasma, human. Lyophilized. 0.85 IU / ampoule.	2nd International Standard, 1994	No. 848, 44th Report	Human plasma	NIBSC	93/768	94.1785
● Anti-thyroglobulin serum, human. Lyophilized. 1,000 IU / ampoule.	1st International Reference Preparation, 1978	No. 638, 30th Report	Human serum	NIBSC	65/093	78.1188
● Anti-toxoplasma serum. Lyophilized. 1,000 IU / ampoule.	3rd International Standard, 1994	No. 858, 45th Report	Human serum	NIBSC	TOXM	94.1761
● Anti-toxoplasma serum (IgG), human. Lyophilized. 20 IU / ampoule.	1st International Standard, 2003	In press	Human serum	NIBSC	01/600	03.1971

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● Anti-varicella zoster immunoglobulin, human. Lyophilized. 50 IU / ampoule.	1st International Standard, 1987	No. 771, 38th Report	Human immunoglobulin	Sanquin	W1044	87.1565
● Apolipoprotein A-1. Lyophilized. 1.5 mg / vial.	1st International Reference Reagent, 1992	No. 840, 43rd Report	Human serum	CDC	SP1-01	92.1706
● Apolipoprotein B. Frozen. 1.22 mg / vial.	1st International Reference Reagent, 1993	No. 848, 44th Report	Human serum	CDC	SP3-07	93.1721
● Beta-2 microglobulin. Lyophilized. 100 IU / ampoule.	1st International Standard, 1985	No. 745, 36th Report	Human serum	NIBSC	B2M	85.1501
● Beta-thromboglobulin, human. Lyophilized. 500 IU / ampoule.	1st International Standard, 1984	No. 725, 35th Report	Purified plasma protein	NIBSC	83/501	84.1455
● Blood coagulation factor IX concentrate, human. Lyophilized. 10.7 IU / vial.	3rd International Standard, 1996	No. 878, 47th Report	Purified plasma protein	NIBSC	96/854	96.1845
● Blood coagulation factor IXa, concentrate, human. Lyophilized. 11.0 IU / ampoule.	1st International Standard, 1999	No. 904, 50th Report	Recombinant protein	NIBSC	97/562	99.1916
● Blood Coagulation Factor V Leiden (G1691A), human gDNA (three samples: FV wild type; FVL homozygote; FVL heterozygote). Lyophilized. No assigned value	1st International Genetic Reference Panel, 2004	In press	Genetic material	NIBSC	04/224	04.1997
● Blood Coagulation Factor V, plasma, human. Lyophilized. 0.74 International Units of Factor V:C per ampoule	1st International Standard, 2005	To be published	Human plasma	NIBSC	03/116	05.2007

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Blood coagulation factor VII concentrate, human. Lyophilized. 6.3 IU / ampoule.	1st International Standard, 1998	No. 897, 49th Report	Purified plasma protein	NIBSC	97/592	98.1876
Blood coagulation factor VIIa concentrate, human. Lyophilized. 5,130 IU / ampoule.	1st International Standard, 1993	No. 848, 44th Report	Recombinant protein	NIBSC	89/688	93.1728
Blood coagulation factor VIII and von Willebrand factor, plasma, human. Lyophilized. 0.68 IU / ampoule Factor VIII:C; 0.94 IU/ampoule factor VIII. Antigen; 0.91 IU/ampoule VWF:antigen; 0.78 IU/ampoule VWF:ristocetin cofactor; 0.94 IU/ampoule VWF:collagen binding	5th International Standard, 2003	In press	Human plasma	NIBSC	02/150	03.1972
Blood coagulation factor VIII concentrate, human. Lyophilized. 11.0 IU / ampoule.	7th International Standard, 2003	In press	Recombinant protein	NIBSC	99/678	03.1973
Blood Coagulation factor XI, plasma human. Lyophilized. 0.86 International Units per ampoule	1st International Standard, 2005	To be published	Human plasma	NIBSC	04/102	05.2017
Blood Coagulation Factor XIII, plasma, human. Lyophilized. 0.91 IU/ampoule	1st International Standard, 2004	In press	Human plasma	NIBSC	02/206	04.1994 Rev.1
Blood coagulation factors II, VII, IX, X, plasma, human. Lyophilized. 0.91 IU (factor II), 1.00 IU (factor VII), 0.86 IU (factor IX), 0.93 IU (factor X) / ampoule.	3rd International Standard, 2001	No. 924, 52nd Report	Human plasma	NIBSC	99/826	01.1946
Blood coagulation factors, II and X concentrate, human. Lyophilized. 11.2 IU (factor II), 10.2 IU (factor X) / ampoule.	3rd International Standard, 1999	No. 904, 50th Report	Purified plasma proteins	NIBSC	98/590	99.1904

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● Carcinoembryonic antigen (CEA), human. Lyophilized. 100 IU / ampoule.	1st International Reference Preparation, 1975	No. 594, 27th Report	Human carcinoma derived	NIBSC	73/601	75.1110
● C-reactive protein, human. Lyophilized. 0.049 IU / ampoule.	1st International Standard, 1986	No. 760, 37th Report	Human plasma	NIBSC	85/506	86.1514
● Ferritin, human, recombinant. Lyophilized. 6.3 µg / ampoule.	3rd International Standard, 1996	No. 878, 47th Report	Recombinant protein diluted in plasma	NIBSC	94/572	96.1838
● Fibrinogen concentrate human. Lyophilized. Total protein 15 mg / ampoule. Clottable protein 10.5 mg / ampoule.	1st International Standard, 2000	No. 910, 51st Report	Purified plasma protein	NIBSC	98/614	00.1927
● Fibrinogen, plasma, human. Lyophilized. 2.2 mg / ampoule.	2nd International Standard, 1999	No. 904, 50th Report	Human plasma	NIBSC	98/612	99.1903
● Haemoglobin A2, raised. Lyophilized. 5.3 % (w/w) of total haemoglobin.	1st International Reference Reagent, 1993	No. 848, 44th Report	Beta-thalassemia haemolysate derived	NIBSC	89/666	93.1754
● Haemoglobin F, raised. Lyophilized. 3.4% (w/w) of total haemoglobin.	1st International Reference Reagent, 1993	No. 848, 44th Report	Cyanmethaemoglobin, haemolysate derived	NIBSC	85/616	93.1755
● Haemoglobincyanide. Liquid. 49.79 µmol / l.	6th International Standard, 1998	No. 897, 49th Report	Bovine hemoglobin	NIBSC	98/708	98.1886

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● Heparin, low molecular weight. Liquid. 1097 IU / ampoule (anti-Xa), 326 IU / ampoule (anti-IIa).	2nd International Standard, 2003	In press	Porcine mucosal derived	NIBSC	01/608	03.1986
● Heparin, low molecular weight (calibrant for molecular weight distribution). Lyophilized. No unitage assigned.	1st International Reference Reagent, 1993	No. 848, 44th Report	Porcine mucosal derived	NIBSC	90/686	93.1727
● Heparin, unfractionated. Lyophilized. 2,031 IU / ampoule.	5th International Standard, 1998	No. 897, 49th Report	Porcine mucosal derived	NIBSC	97/578	98.1875
● Hepatitis A RNA. Lyophilized. 50,000 IU / vial.	1st International Standard, 2003	No. 926, 53rd Report	Nucleic acid preparation	NIBSC	00/560	03.1959
● Hepatitis B surface antigen, subtype adw2, genotype A. Lyophilized. Dilutional panel (IU/vial: 8.25; 2.06; 0.52; 0.13)	1st International Reference Panel, 2003	In press	Recalcified human plasma	NIBSC	03/262	03.1987
● Hepatitis B surface antigen, subtype adw2, genotype A. Lyophilized. 33 IU / vial.	2nd International Standard, 2003	In press	Recalcified human plasma	NIBSC	00/588	03.1987
● Hepatitis B virus DNA. Lyophilized. 500,000 IU / vial.	1st International Standard, 1999	No. 904, 50th Report	Nucleic acid preparation	NIBSC	97/746	99.1917
● Hepatitis C virus RNA. Lyophilized. 50,000 IU / vial.	2nd International Standard, 2003	No. 926, 53rd Report	Nucleic acid preparation	NIBSC	96/798	97.1861
● HIV-1 p24 antigen. Lyophilized. 1,000 IU / ampoule.	1st International Reference Reagent, 1992	No. 840, 43rd Report	Peptide in human serum	NIBSC	90/636	92.1699

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HIV-1 RNA. Lyophilized. 5.56 log ₁₀ International Units per vial	2nd International Standard, 2005	To be published	Nucleic acid preparation	NIBSC	97/650	05.2021
HIV-1 RNA genotypes (set of 10 genotypes). Liquid. No assigned value	1st International Reference Panel, 2003	No. 926, 53rd Report	Nucleic acid preparation	NIBSC	01/466	03.1961
Human brain, CJD control. Lyophilized. No assignment	1st International Reference Reagent, 2003	No. 926, 53rd Report	Brain homogenate	NIBSC	NHBZ0/0005	03.1965 Rev.1
Human brain, sporadic CJD, preparation 1. Lyophilized. No assignment	1st Reference Reagent, 2003	No. 926, 53rd Report	Brain homogenate	NIBSC	NHBX0/0001	03.1965 Rev. 1
Human brain, sporadic CJD, preparation 2. Lyophilized. No assignment	1st Reference Reagent, 2003	No. 926, 53rd Report	Brain homogenate	NIBSC	NHBX0/0002	03.1965 Rev. 1
Human brain, variant CJD. Lyophilized. No assignment	1st Reference Reagent, 2003	No. 926, 53rd Report	Brain homogenate	NIBSC	NHBY0/0003	03.1965 Rev.1
Human serum complement components C1q, C4, C5, factor B, and whole functional complement CH50. Lyophilized. C1q : 100 IU / ampoule, C4 : 100 IU / ampoule, Factor B : 100 IU / ampoule, Whole functional complement CH50 : 100 IU / ampoule.	1st International Reference Preparation, 1980	No. 658, 31st Report	Human serum	Sanquin	W1032	80.1281
Human serum immunoglobulin E. Lyophilized. 5,000 IU / ampoule.	2nd International Reference Preparation, 1980	No. 658, 31st Report	Human serum	NIBSC	75/502	79.1240

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● Human serum immunoglobulins G, A, and M (IgG, IgA and IgM). Lyophilized. 100 IU IgG, 100 IU IgA and 100 IU IgM / ampoule.	1st International Reference Preparation, 1970	No. 463, 23rd Report	Human serum	NIBSC	67/086	70.1019
● Human serum proteins, for immunoassay: albumin; alpha-1-antitrypsin; alpha-2-macroglobulin; ceruloplasmin; complement C3; transferrin. Lyophilized. 100 IU of each protein / ampoule.	1st International Reference Preparation, 1977	No. 626, 29th Report	Human serum	Sanquin	W1031	77.1155
● Immunoglobulin, intravenous: anti-D negative control. Lyophilized. No assigned value	1st Reference Reagent, 2004	In Press	Human immunoglobulin	NIBSC	02/226	04.2002
● Immunoglobulin, intravenous: anti-D positive control. Lyophilized. No assigned value	1st Reference Reagent, 2004	In Press	Human immunoglobulin	NIBSC	02/228	04.2002
● Islet cell antibodies. Lyophilized. 20 units / ampoule of islet cell antibodies; 100 units / ampoule of anti-GAD65; 100 units / ampoule of anti-IA-2.	1st Reference Reagent, 1999	No. 904, 50th Report	Human serum	NIBSC	97/550	99.1896
● Lipoprotein (a). Lyophilized. 0.107 nanomoles/vial	1st Reference Reagent, 2003	In press	Human serum	CDC	IFCC SRM 2B	03.1979
● Parvovirus B19 DNA human. Lyophilized. 500 000 IU / ampoule.	1st International Standard, 2000	No. 910, 51st Report	Human plasma	NIBSC	99/800	00.1928
● Plasmin, human. Lyophilized. 5.3 IU / ampoule.	3rd International Standard, 1998	No. 897, 49th Report	Human plasma protein	NIBSC	97/536	98.1887

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<p>Plasminogen-Activator Inhibitor 1 (PAI-1), human. Lyophilized. Tissue-plasminogen-activator: 27.5 IU of neutralising activity / ampoule. Urinary-plasminogen-activator: 7 IU of neutralising activity / ampoule.</p>	1st International Standard, 1995	No. 872, 46th Report	Recombinant protein [Chinese Hamster Ovary cells (CHO)], spiked in plasma	NIBSC	92/654	95.1805
<p>Platelet factor 4. Lyophilized. 400 IU / ampoule.</p>	1st International Standard, 1984	No. 725, 35th Report	Human platelet protein	NIBSC	83/505	84.1455
<p>Prekallikrein activator. Lyophilized. 29 IU / ampoule.</p>	2nd International Standard, 2003	In press	Purified from human plasma	NIBSC	02/168	03.1974
<p>Prostate specific antigen. Lyophilized. 1 µg total PSA per vial.</p>	1st Reference Reagent, 1999	No. 904, 50th Report	Purified plasma protein	NIBSC	96/668	99.1902
<p>Prostate specific antigen (90:10). Lyophilized. 1 µg total PSA per vial.</p>	1st Reference Reagent, 1999	No. 904, 50th Report	Purified plasma protein	NIBSC	96/670	99.1902
<p>Protein C, plasma, human. Lyophilized. 0.82 IU / ampoule.</p>	1st International Standard, 1987	No. 771, 38th Report	Human plasma	NIBSC	86/622	87.1561
<p>Protein S, plasma, human. Lyophilized. 0.90 IU / ampoule.</p>	1st International Standard, 1995	No. 872, 46th Report	Human plasma	NIBSC	93/590	95.1804
<p>Prothrombin Mutation G20210A. Lyophilized. No assigned activity</p>	1st International Genetic Reference Panel, 2005	To be published	Purified plasma protein	NIBSC	05/130	05.2022

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● Rheumatoid arthritis serum. Lyophilized. 100 IU / ampoule.	1st International Reference Preparation, 1973	No. 530, 25th Report	Human serum	Sanquin	W1066	73.1067
● Serum amyloid A protein. Lyophilized. 0.15 IU / ampoule.	1st International Standard, 1997	No. 889, 48th Report	Human serum	NIBSC	92/680	97.1860
● Streptokinase. Lyophilized. 1,030 IU / ampoule.	3rd International Standard, 2001	No. 924, 52nd Report	Purified from streptococcus hemolyticus culture	NIBSC	00/464	01.1948
● Streptokinase and Streptodornase. Freeze-dried 3100 IU of streptokinase and 2400 IU of streptodornase per ampoule	1st International Standard, 1964	293, 17th Report	Enzyme	NIBSC	62/007	BS/716
● Thrombin, human. Lyophilized. 110 IU / ampoule.	2nd International Standard, 2003	No. 926, 53rd Report	Purified plasma protein	NIBSC	01/580	03.1955
● Thromboplastin, bovine, combined. Lyophilized. International Sensitivity Index: 1.0.	2nd International Reference Preparation, 1983	No. 700, 34th Report	Brain derived	Sanquin	OBT/79 (W1053)	83.1393
● Thromboplastin, human, recombinant, plain. Lyophilized. International Sensitivity Index: 0.940.	3rd International Reference Preparation, 1996	No. 878, 47th Report	Recombinant protein	Sanquin	rTF/95 (W1054)	96.1846 Rev.1
● Thromboplastin, rabbit, plain. Lyophilized. International Sensitivity Index (ISI) value of 1.15	4th International Standard, 2005	To be published	Brain-derived		04/162	05.2029
● Thyroid-stimulating antibody. Lyophilized. 0.1 IU / ampoule.	1st International Reference Preparation, 1995	No. 872, 46th Report	Human serum	NIBSC	90/672	95.1818

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Tissue Plasminogen Activator (t-PA), human, recombinant. Lyophilized. 10,000 IU / ampoule.	3rd International Standard, 1999	Nos. 897; 904 & 910: 49th, 50th & 51st Reports	r-tPA. [Chinese Hamster Ovary cells (CHO)]	NIBSC	98/714	99.1913
Urokinase, high molecular weight. Lyophilized. 4,300 IU / ampoule.	1st International Standard, 1989	No. 800, 40th Report	Two chain urine derived	NIBSC	87/594	89.1622
Vitamin B12 and Folate in human serum. Lyophilized. 12.08 nmol/l of folate and 480 pg/mL of vitamin B12 per ampoule	1st International Standard, 2005	To be published	Human serum	NIBSC	03/178	05.2025
Vitamin B12, in human serum. Lyophilized. 320 pg / ampoule.	1st International Reference Reagent, 1992	No. 840, 43rd Report	Human serum	NIBSC	81/563	92.1703
von Willebrand Factor, Concentrate. Freeze-dried VWF:RCo 9.4 IU per ampoule; VWF:Ag 11.0 IU per ampoule	1st International Standard, 2001	No. 924, 52nd Report	Purified plasma protein	NIBSC	00/514	01.1947
Whole blood folate. Lyophilized. 13 ng / ampoule.	1st International Standard, 1996	No. 878, 47th Report	Hemolysed blood	NIBSC	95/528	95.1806